Strategic Plan

2015-2020

The Start of Something Big

Department of Civil Engineering

Stony Brook University

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Our Story

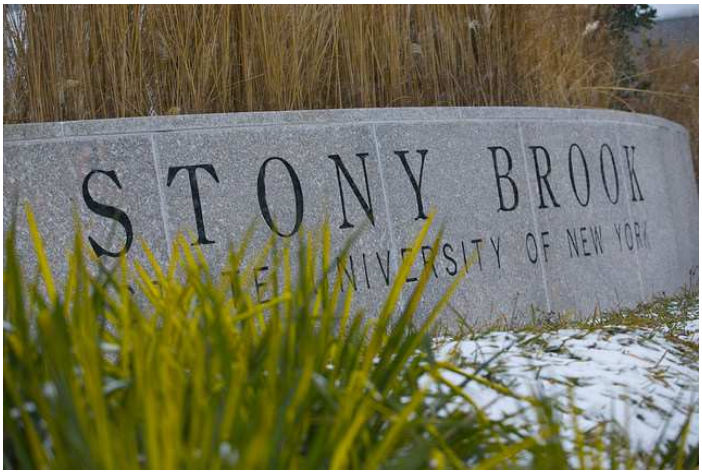
On October 16, 2013 Governor Andrew Cuomo announced the start of construction on the new Tappan Zee Bridge. The nearly $4 billion project is expected to be completed in July of 2018 and is the biggest on-going construction project in North America. The new Tappan Zee Bridge will be a dual-span cable-stayed twin bridge over the Hudson River, roughly 3 miles long. The new Tappan Zee Bridge will be the longest bridge in the State of New York and is designed to meet the transportation needs of the region for the next 100 years.

Here at Stony Brook University, we are also embarking on something big– the development of the new Civil Engineering Program! Our new program was launched in the Fall of 2012, just months before construction began on the new Tappan Zee Bridge. **Our goal is no less ambitious -- to train the next generation of civil engineers to tackle society's most pressing problems**. To do so, we will establish one of the top civil engineering programs in not only New York, but the nation. As one of the flagship institutions in the largest state university system in the United States, we have a tremendous opportunity and responsibility to serve the state of New York and become a place for discovery, innovation, and creation of value. By the time the Tappan Zee Bridge is completed in 2018, we aim to be one of the top Civil Engineering programs in New York, have graduated our third class of undergraduate students, be fully accredited by ABET, have a robust graduate program up-and-running, and be a full-fledged, independent department in the College of Engineering and Applied Sciences at Stony Brook University.

As a new program, we have the opportunity to "think big," and we will give our students the education to think big as well. Our goal is to train the next generation of civil engineers to design and build a more sustainable and resilient system of infrastructure, one that will ensure the health, welfare and safety of the public for the next 100 years.

Harold W. Walker, Ph.D., P.E.
Director, Civil Engineering Program

About Stony Brook University



Stony Brook University is one of America's most dynamic public universities, a center of academic excellence and an essential part of the region's economy.

Nobel laureates, Guggenheim fellows and MacArthur grant winners teach on our campus, making it a magnet for outstanding students. U.S.News & World Report ranks Stony Brook among the top 100 universities in the nation, and the Times Higher Education World University Rankings places us in the top 1 percent of universities in the world. A member of the elite Association of American Universities, Stony Brook is one of the 62 top research institutions in North America. Our faculty are leaders in significant national and worldwide projects, including uncovering the causes of lobster mortality in Long Island Sound, searching for the origins of man in Kenya's Turkana Basin, and managing the national parks of Madagascar. They also have made significant contributions to NASA initiatives, such as examining Martian minerals for evidence of life and other phenomena.

Stony Brook offers more than 200 undergraduate programs, 100 master's programs, and 40 doctoral programs to a total student population of more than 24,600.

Our College of Engineering and Applied Sciences offers seven ABET-accredited programs, our School of Marine and Atmospheric Sciences features waterfront learning, and we have the only undergraduate School of Journalism in New York at a public university. The University is also home to the Alan Alda Center for Communicating Science. Our Undergraduate Research and Creative Activities (URECA) program was included four years in a row in U.S.News & World Report's list of academic programs to look for. Our clinical psychology, geometry and nuclear physics programs have been ranked in the top 10 graduate programs nationwide.

Stony Brook also co-manages nearby Brookhaven National Laboratory, joining such prestigious schools as Princeton, Stanford and the University of Chicago on the list of major institutions that run federal research laboratories. In addition, BNL and Stony Brook collaborate with Cold Spring Harbor Laboratory — one of the world's pre-eminent private research institutes. The entrepreneurial energy and economic strength of the University bring a combined benefit of $4.6 billion to the economy of Long Island. Stony Brook has a remarkable record of fruitful collaboration with private enterprise. Through its high-technology incubators, Stony Brook has promoted the launch of 44 companies.

Our Center of Excellence in Wireless and Information Technology (CEWIT) and two state-designated Centers for Advanced Technology — in diagnostic tools and sensor systems and in biotechnology — facilitate partnerships between New York State industry and University research. Our Advanced Energy Research and Technology Center (AERTC) brings together academic and research institutions, energy providers and industry to focus on innovative energy solutions.

Stony Brook Southampton, on Long Island's East End, is home to the Southampton Arts MFA programs and summer workshops, the School of Marine and Atmospheric Sciences' new Marine Sciences Center, and the undergraduate residential Semester by the Sea program in marine sciences. Stony Brook Manhattan, our urban location, connects the University to New York City. Songdo-based SUNY Korea, a partnership between Stony Brook University, the State University of New York (SUNY) and the South Korean government, opened its doors in March 2012 as the first American university established on Korean soil. It is also the first university to join the Songdo Global University Campus.

Mission

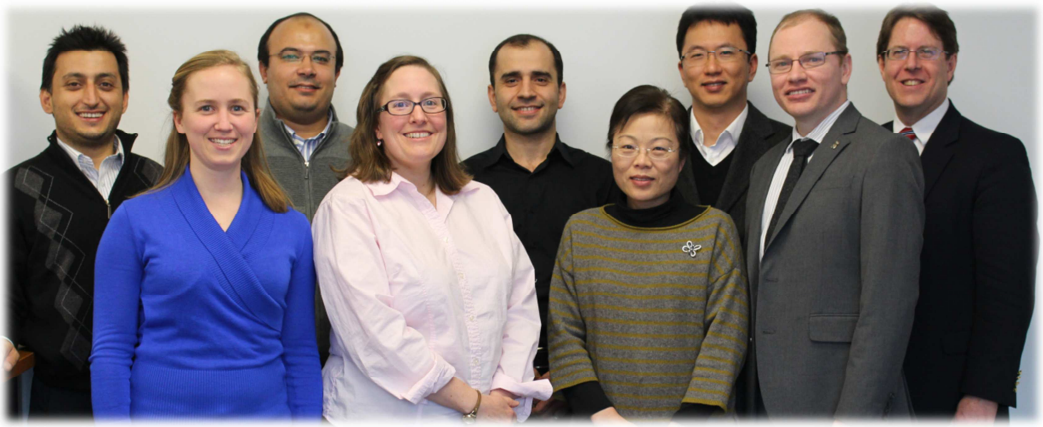
The mission of the Department of Civil Engineering is to make a positive difference in people's lives by addressing societies most pressing infrastructure and environmental problems, being a center of innovation and discovery to improve the resiliency and sustainability of the built environment, and educating the next generation of civil engineers.

Vision

The Civil Engineering Program will be a collegial, diverse, and passionate academic community, and will become one of the top Civil Engineering programs in the State of New York, recognized nationally and internationally for innovation and excellence.

Values

We value nurturing passion, creativity, and innovation; supporting each other and working collaboratively in teams; fostering an open, vibrant and diverse community; modeling the highest standards of integrity; promoting problem solving, collegiality and cooperation in our professional relationships; being socially-aware and fully-engaged with society, locally and globally; and achieving excellence in all our professional activities.



Strategic Scan

Strengths

Our students, staff and faculty are hard-working, dedicated, and passionate.

We have healthy undergraduate enrollments with increases likely as the program obtains accreditation and becomes more established in the future.

We are the only Civil Engineering program on Long Island which has a population of 2.8 million people.

The job outlook for Civil Engineers is strong over the next five years and one of the best in engineering (only biomedical is higher). The U.S. Bureau of Labor estimates jobs in Civil Engineering will grow "faster than average" at 20% from 2012 to 2022.[1]

Both graduate and undergraduate tuition at Stony Brook is some of the lowest in the country.

Stony Brook has a strong reputation locally, nationally, and internationally.

Stony Brook University has a high-quality, engaged, and diverse student body.

The University has very good services and facilities for hosting workshops, conferences, and other meetings, including the Hilton Garden Inn, the Wang Center, Child's Mansion, and Campus Catering.

The Alan Alda Center for Communicating Science is a unique center nationally.

[1] http://www.bls.gov/ooh/architecture-and-engineering/civil-engineers.htm.

Weaknesses

Our small size, low number of faculty, and lack of facilities hinders our ability to reach our goals.

As a new program, we lack an alumni base to draw upon for support.

We have limited course offerings.

Our graduate program is just getting off the ground.

The cost of living on Long Island is high.

Opportunities

The declining state of the nation's infrastructure and increased pressure due to extreme events (natural, technological, and social), highlights the need for new, innovative ideas to make our infrastructure more resilient and sustainable.

Stony Brook has one of only two comprehensive (BE through PhD) Civil Engineering programs in the SUNY system.

There is a significant need for Civil Engineers in the Long Island and NYC Metropolitan area.

The need for cutting-edge research to spur economic development in New York and the nation is critical.

Efforts to increase the educational requirements for licensure and the complex nature of engineering suggest greater emphasis and need for continuing education[2].

Brookhaven National Laboratory and Cold Spring Harbor Laboratory offer unique opportunities for research and collaboration.

The location of Stony Brook and proximity to New York City provides a unique opportunity to play a lead role in developing solutions to reduce the impact of natural hazards in the coastal environment.

We have strong undergraduate students draw upon for our graduate program.

Threats

[2] ASCE, The Vision for Civil Engineering in 2025, 2006 and Achieving the Vision for Civil Engineering in 2025, 2009.

Cyclical state budgets in the short-term, and declining budgets in the long-term, necessitates a diverse revenue stream to support program activities.

Steady or declining numbers of women and minorities in civil engineering nationally suggests enhanced efforts are needed to recruit and retain a diverse faculty, staff and student body[3].

Federal support for research is steady or declining, suggesting greater need to establish university-industry collaborations and obtain funding from foundations and other sources.

Loss of faculty and staff to “greener pastures.”

[3] http://www.nsf.gov/statistics/2015/nsf15311/.

Overarching Goals

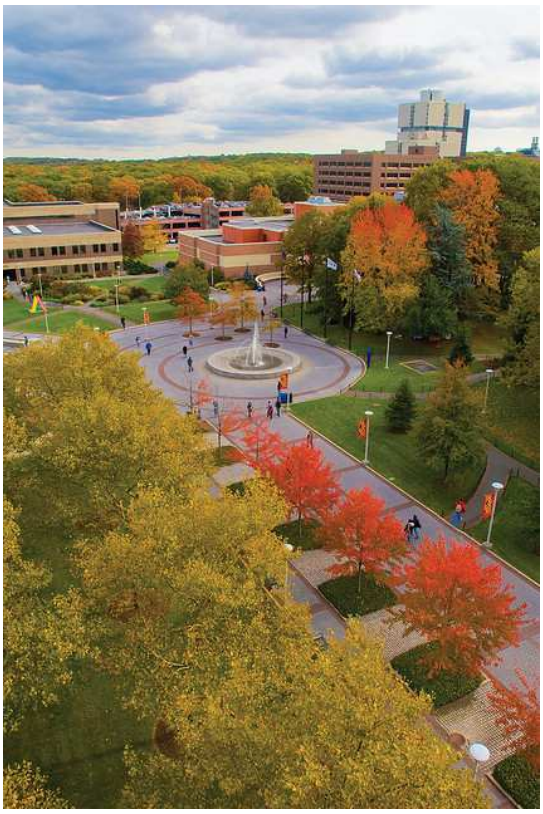
To support our mission, vision, and values, we will aggressively and passionately pursue the following four overarching goals:

1. Foster diversity and create a culture of excellence

2. Offer premier educational programs, from the B.E. to the Ph.D.

3. Be nationally recognized for innovation and excellence in interdisciplinary, civil engineering research, and

4. Engage the public and private sector to build fruitful, mutually-beneficial relationships.



Strategies

Goal 1. Foster diversity and create a culture of excellence

1. Recruit and retain the best students, staff and faculty
2. Promote and recognize excellence in the department
3. Support and foster diversity

Goal 2. Offer premier educational programs, from the B.E. to the Ph.D.

1. Offer an outstanding B.E. in Civil Engineering that prepares graduates for successful careers in engineering and graduate school
2. Launch Advanced Graduate Certificate, M.S., and Ph.D. programs in Civil Engineering

Goal 3. Be nationally recognized for innovation and excellence in interdisciplinary, civil engineering research

1. Conduct research of highest quality and impact
2. Become a leader in interdisciplinary research
3. Develop state-of-the-art research facilities
4. Leverage existing strengths within and external to the university
5. Enhanced the competitiveness of faculty research proposals, and
6. Obtain recognition for research accomplishments

Goal 4. Engage the public and private sector to build fruitful, mutually-beneficial relationships

1. Increase the visibility of the Civil Engineering program
2. Develop mutually beneficial activities with stakeholders, and
3. Provide leadership on important issues related to research, infrastructure and engineering education.

Goal 1. Foster diversity and create a culture of excellence

The Civil Engineering Program aims to foster a diverse faculty, staff and student body and create a culture that values excellence in teaching, research and service. We aim to create and support a department culture that values openness, transparency, collaboration, creativity, and passion. To accomplish this, we will:

1. Recruit and retain the best students, staff and faculty,
2. Promote and recognize excellence in the department, and
3. Support and foster diversity.

Morgan DiCarlo (class of '16), third from left, one of six "Stars of Stony Brook" with Jane Fonda and other award recipients at the Stony Brook Gala, 2015 in New York City.

Strategy: Recruit and retain the best students, staff and faculty

ACTION	METRICS
Create a welcoming, collegial, and collaborative academic environment	-establish a faculty, staff, and student "welcome" program -establish a new student reception and/or orientation
Secure and fill additional faculty and staff lines from the University	-number of full-time equivalent tenure-track faculty positions and staff lines
Establish and maintain high standards for student admission to undergraduate and graduate programs	-incoming GPA, SAT for incoming undergraduate students -incoming GPA, GRE scores for incoming graduate students
Establish a student, staff, and faculty mentoring program	-Develop and implement a faculty, staff, and student mentoring program

Strategy: Promote and recognize excellence in the department

ACTION	METRICS
Establish student chapter of Chi Epsilon and an Undergraduate Honors Program	-Recognized student chapter of Chi Epsilon -Develop and implement a Department Honors Program -Number of students in Chi Epsilon -Number of honors students
Establish department awards for faculty, staff and students	-Number and type of departmental awards
Promote faculty, staff, and students for university and external awards and honors	-Number of awards by faculty, staff and students

Strategy: Support and foster diversity

ACTION	METRICS
Create a supportive environment for diverse groups	-establish a faculty, staff, and student "welcome" program
Establish a student, staff, and faculty mentoring program	-Develop and implement a faculty, staff, and student mentoring program
Identify and actively recruit women and minority faculty, staff and students	-Number of women and minority faculty, staff and students
Leverage existing university programs and external resources	-identify and take advantage of existing programs

Goal 2. Offer premier educational programs, from the B.E. to the Ph.D.

Our second goal is to offer premier educational programs, from the B.E. to the Ph.D. that prepare students for exciting careers in private consulting, government agencies, and/or academia. To this end, we aim to:

1. Offer an outstanding B.E. in Civil Engineering that prepares graduates for successful careers in engineering or graduate school, and
2. Launch an Advanced Graduate Certificate, M.S., and Ph.D. Programs in Civil Engineering.

Strategy. Offer an outstanding B.E. program that prepares graduates for successful careers in engineering or graduate school

ACTION	METRICS
Prepare graduates for careers in Civil Engineering, or related fields	-number of graduates -job placement
Prepare and mentor students for success in graduate school	-Number of students going to graduate school
Increase the number and quality of our students	-number of applications per year -average GPA and SAT scores of enrolled students
Embrace continuous improvement	- a program of continuous improvement leading to ABET accreditation
Develop new, state-of-the-art teaching laboratories and educational spaces	-Establish teaching laboratories in Civil Engineering Materials, Geotechnical Engineering, Hydraulics, and Civil Engineering Innovation
Expand course offerings and co-curricular activities	-number of UG courses -number of student teams and competitions

Increase the number of faculty with PE licenses	-number of faculty with PE licenses
Provide a hands-on education emphasizing engineering design and innovation	-invite speakers from industry to lecture on courses -establish an “Design and Innovation Lab”
Enable students to lead and work in multidisciplinary teams	-develop interdisciplinary projects and courses

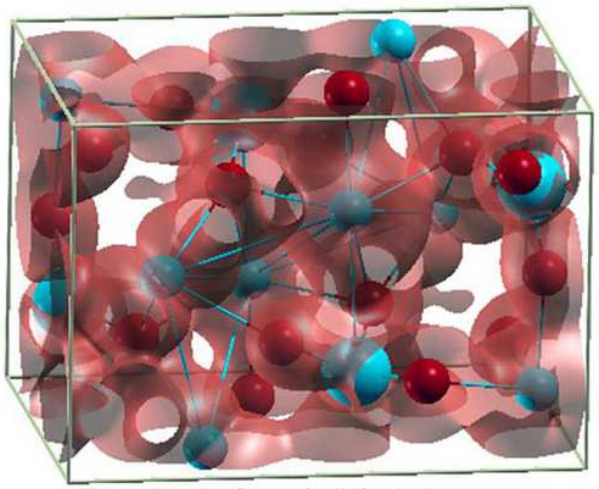
Strategy. Launch Advanced Graduate Certificate, M.S., and Ph.D. Programs in Civil Engineering

ACTION	METRICS
Obtain NYSED approval for new degree programs	-registered new degree programs
Prepare graduates for careers in government, industry and academia	-number of graduates -job placement -academic mentoring program for PhD students
Actively recruit excellent students	-GPA, GRE scores of incoming graduate students -establish recruitment pipelines
Establish BE/MS program	-established BE/MS program
Expand course offerings	-number of graduate level courses -establish guidelines for PhD students to teach courses
Develop state-of-the-art research facilities	-research labs -major facilities or instrumentation
Increase funding for graduate students through RA, TA/GA and fellowships	-number of supported students
Develop on-line graduate certificate in coastal zone management and engineering	-establishment of certificate program

Goal 3. Be nationally recognized for innovation and excellence in interdisciplinary, civil engineering research

Our goal is to become recognized nationally for innovation and excellence in interdisciplinary research. To accomplish this goal, we intend to:

1. Conduct research of the highest quality and impact
2. Be a leader in interdisciplinary research
3. Develop state-of-the-art research facilities
4. Leverage existing strengths within and external to the university
5. Enhanced the competitiveness of research proposals, and
6. Obtain national recognition for research accomplishments



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Strategy. Conduct research of the highest quality and impact

ACTION	METRICS
Successfully secure research funds for high quality work	-research grants and expenditures
Publish research findings in high quality journals	-quality and number of journal publications

Strategy. Be a leader in interdisciplinary research

ACTION	METRICS
Establish thrusts in coastal engineering, molecular science, resilience and sustainability	-established thrust areas

Take leadership role in developing large, multidisciplinary proposals	-number of large initiatives funded with leadership role in department
Encourage and support joint faculty appointments	-number of faculty with joint appointments
Successfully secure research funds for interdisciplinary research	-percentage of funding for interdisciplinary research
Publish interdisciplinary research findings	-number of publications with co-authors in different disciplines
Align with SUNY/SBU/CEAS interdisciplinary thrust areas	-aligned thrust areas

Strategy. Develop state-of-the-art research laboratories

ACTION	METRICS
Secure suitable space for development of new research facilities	-square footage of research space -funds spent on renovation
Leverage existing start-up funds and attract new grants to develop and equip laboratory facilities	-start-up funding -major or unique facilities
Develop plans for a dedicated, Civil Engineering building	-plan

Strategy. Leverage existing strengths

ACTION	METRICS
Expand collaborations with Brookhaven National Laboratory and Cold Spring Harbor Laboratory	-joint proposals, programs, etc.
Develop joint initiatives with SoMAS and other SBU academic units and centers	-joint proposals, programs, etc.
Encourage undergraduates to be involved in research	-number of UGs doing research -UG research symposium

Strategy. Enhance the competitiveness of research proposals

ACTION	METRICS
Provide travel funds for faculty to meet with federal and state funding agencies	-travel fund budget
Establish faculty mentoring program	-mentoring program
Facilitate and support research collaborations	-number of research collaborations

Strategy. Obtain recognition for research accomplishments

ACTION	METRICS
Recognize and publicize research accomplishments	-press releases about research -webpage articles
Nominate faculty and students for university, state and national research awards	-number of research awards

Goal 4. Engage the public and private sector to build fruitful, mutually-beneficial relationships

In addition to research and education, we aim to fully engage the public and private sector to build fruitful, mutually beneficial relationships.
To accomplish this goal, we intend to:

1. Increase the visibility of the Civil Engineering program
2. Develop mutually beneficial activities with stakeholders, and,
3. Provide leadership on important issues related to infrastructure and engineering education.

Strategy. Increase the visibility of the program

ACTION	METRICS
Establish independent department	-department status
Create/maintain an attractive and engaging presence on the web	-develop and maintain attractive website
Host meetings, seminars, workshops and conferences	-number of meetings, seminars, workshops, and conferences hosted
Provide PDH's for practice community	-PDH hours per year
Hold a "cupcake day" or similar event to increase visibility in university and thank supporters	-annual cupcake day or equivalent
Develop logo for department	-logo

Strategy. Develop mutually beneficial activities with stakeholders

ACTION	METRICS
Establish themes and specific opportunities for advancement and giving	-Identify themes for advancement and giving -"1-pagers" on specific giving opportunities -fellowships and scholarships for our students
Provide opportunities for stakeholders to get involved with the program	-develop external advisory board (EAB) -develop industrial mentoring program -identify industry research collaborations -develop alumni mentoring program
Maintain contact with alumni	-create and maintain email list of alumni -host alumni BBQ once per year

Strategy. Provide leadership on important issues related to research, infrastructure and engineering education

ACTION	METRICS
Serve on major committees on research, infrastructure and engineering education	-number of major committees served
Encourage faculty and students to engage with stakeholders at the local, state, and national level	-invited membership on panels, workshops, forums, etc.

Interdisciplinary Thrust Areas

Civil and Engineering will be recognized for innovation and excellence in structural, geotechnical, transportation, and environmental engineering by creating strength around interdisciplinary research themes. Specifically, the department will be built around the themes of "molecular science and engineering," "sustainability and resiliency," and "coastal engineering." There is strong potential for Civil Engineering and Stony Brook University to quickly gain strength in these thematic research areas and thereby distinguish itself as one of the top programs in Civil and Environmental Engineering in the country. Concentrating our efforts and resources in these areas will position the department to discover solutions to society's most pressing problems, including those identified in the National Academic of Engineering (NAE) Grand Challenges for Engineering (e.g., decaying infrastructure, clean water, sustainable and resilient cities).[4] Further, these thematic research areas align well with the strategic research directions of the College of Engineering and Applied Sciences[5] in the areas of "energy and environment" and "security and defense, " the Stony Brook University Strategic Vision[6], and the SUNY strategic areas of "Energy" and "Vibrant Communities."[7]

Sustainable and Resilient Infrastructure

Civil Engineering will also become a leader in research for sustainable and resilient infrastructure. There is a clear need for approaches that facilitate the design, construction, operation, and monitoring of resilient and sustainable infrastructure systems at various scales (i.e., from local to regional and global), with a focus on challenges related to energy, safe drinking water, sanitation, climate change, and coastal development. The location of Stony Brook and proximity to New York City provides a unique opportunity to play a lead role in developing solutions to reduce the impact of natural hazards in the coastal environment. Civil infrastructure and environmental systems is a research area with great potential impact as well as opportunities for funding (e.g., NSF programs on "Sustainable and Resilient Infrastructure" and "Infrastructure Management and Extreme Events"). This thematic focus area is multi- and interdisciplinary and leverages existing programs at Stony Brook University in Technology and Society, Computer Science, Sociology, Public Policy, Sustainability Studies, and Business.

Coastal Engineering

The location of Stony Brook University on Long Island and the presence of the School of Marine and Atmospheric Sciences (SoMAS) on the Stony Brook campus are assets the Department of Civil Engineering can leverage to quickly develop a nationally-recognized program in Coastal Engineering.

[4] National Academy of Engineering, http://www.engineeringchallenges.org/.
[5] Engineering 2020: Ten-Year Strategic Plan, College of Engineering and Applied Sciences, Stony Brook University.
[6] Reimagining Stony Brook: A Strategic Vision for 2013-2015, Stony Brook University.
[7] The Power of SUNY: Strategic Plan, 2010 and Beyond, State University of New York.

Coastal engineering faculty may be affiliated with any of the core sub-disciplines in the department (structural, geotechnical, transportation, environmental) and may also cross-cut with the other major thematic areas (i.e., “molecular science and engineering” and “ infrastructure and environmental systems”). Possible areas of research include wave-structure interactions, near-shore hydrodynamics, wave and tidal energy, coastal sensor technology, extreme events, coastal structures, beach erosion and control, coastal storm surge and flooding, climate change, urban coastal infrastructure and policy, and sustainability and resilience of coastal communities. Stony Brook University will have the only program in coastal engineering in the SUNY system, which will position the University well for attracting both state and federal funding. In addition to SoMAS, this thrust area will enable collaborations with Sustainability Studies, Technology and Society, Geosciences and other academic units on campus.

Molecular Science and Engineering

There is great potential for the Department of Civil and Environmental Engineering to leverage the facilities and expertise available at Brookhaven National Laboratory (BNL) and quickly become a leader in the application of molecular science and engineering to problems in Civil and Environmental Engineering. Existing research facilities at BNL, most notably, the recently completed National Synchrotron Light Source (NSLS) II and the Center for Functional Nanomaterials (CfN), offer unprecedented opportunities for the Civil and Engineering at Stony Brook University. Possible areas of research include design of the next generation of civil engineering materials, such as smart materials and self-healing structural elements, development and application of sensors for structural health monitoring, development of materials for energy efficiency and 3 conversion in building systems, micro-, nano- and molecular-scale mechanics of civil engineering materials, development of new surface coatings, understanding the molecular basis of corrosion and preventing corrosion, and design of civil engineering materials for extreme environments. Molecular level approaches in environmental engineering also have great potential for providing unprecedented understanding of the interactions of pollutants with surfaces, the design of treatment processes using nanotechnology, and the development of catalysts and other surface chemical processes. This thematic focus area will enable colorations between Civil Engineering and Materials Science, Chemical Engineering, Chemistry and Biology.

Enabling Activities

Maximize internal and external revenue streams, including operating budgets, indirect cost returns, tuition returns, and gifts.

Minimize non-essential activities not aligned with plan.

Streamline administrative processes whenever possible, without sacrificing quality.

Share information and learn from each other.

Go electronic whenever possible.