

April 17, 2024

TO: Members of the Board of Trustees

FROM: Anne D'Alleva, Ph.D.
Provost and Executive Vice President for Academic Affairs



RE: Renaming the Department of Civil and Environmental Engineering as the School of Civil and Environmental Engineering in the College of Engineering

RECOMMENDATION:

That the Board of Trustees rename the Department of Civil and Environmental Engineering as the School of Civil and Environmental Engineering in the College of Engineering.

BACKGROUND:

In September 2023, the School of Engineering was renamed to the College of Engineering, recognizing significant growth in enrollment, program offerings and research impact. Along with this renaming came the renaming of the Department of Computer Science and Engineering to the School of Computing and the Department of Mechanical Engineering to the School of Mechanical, Aerospace and Manufacturing Engineering. In addition, there are five departments, including Biomedical Engineering; Chemical and Biomolecular Engineering; Civil and Environmental Engineering; Electrical and Computer Engineering; and Materials Science and Engineering, and over twenty-five centers and institutes within the College.

Over the past two decades, the Department of Civil and Environmental Engineering has seen considerable growth, with undergraduate enrollment increasing from 150 in Fall 2003 to 390 in Fall 2023. Research expenditures have increased from \$5.3M in 2015 to \$12M in 2023 with faculty members leading several successful research centers, including the Connecticut Transportation Institute, National Institute for Underwater Vehicle Technology, and Eversource Energy Center. All these activities resonate with national emphasis on infrastructure, resilience, energy and sustainability, aligning with the University's Strategic Plan.

The transition from a Department to a School of Civil and Environmental Engineering will inspire enhancements that increase the relevance and appeal of civil and environmental engineering educational offerings. These changes will strategically align with evolving professional demands, the expectations of UConn's stakeholders, and the diverse interests and abilities of our students. This renaming will not require any additional resources. The School of Civil and Environmental Engineering will be overseen by a Director, who will report to the Dean of the College of Engineering. The School will function in a manner equivalent to a department within the College, and the School's Director will be hired and evaluated the same way that department heads are hired and evaluated.

The School of Civil and Environmental Engineering Proposal

Introduction

The School of Civil and Environmental Engineering (SCEE) is set to transition from a Department, responding to the State of Connecticut workforce needs and global challenges with a vision for sustainable and resilient civil and infrastructure solutions and a commitment to educational excellence. Marked by growth from 150 to 390 undergraduates since 2003, significant rises in research expenditures (\$5.3M to \$12M per year) and graduate offerings, the SCEE aspires to meet an increasing workforce demand highlighted by a projected job increase due to the Infrastructure Investment and Jobs Act. The shift to an independent School aims to enhance educational relevance through specialized undergraduate tracks, an accelerated 5-year master's of science degree, and proposed new major programs in construction management and coastal engineering, alongside interdisciplinary minors. This evolution also entails close industry collaboration, an emphasis on public engagement and service, and an expansion of research capabilities in line with the University's land-grant mission, positioning SCEE as a key player in shaping the nation's infrastructure and environmental future.

A critical backdrop to this transition is an imminent workforce shortage in both the civil and environmental engineering professions. The U.S. Bureau of Labor Statistics predicts a 5% and 6% growth rate, respectively, for civil and environmental engineers, with around 25,000 new positions each year throughout this decade. However, this estimation reflects only replacement needs, neglecting to consider the impact of the Infrastructure Investment and Jobs Act and the vital role civil and environmental engineers will play in its implementation. Moody's estimates that infrastructure projects will generate 883,600 jobs by 2030 and increase per capita income by 10.5% as a result. Conversations are ongoing with the Connecticut Department of Transportation (CTDOT) commissioner and the Public Health Branch Chief at the Connecticut Department of Public Health to actively address this critical gap. Additionally, consulting firms, which are major employers for our students, are requesting lists of soon-to-be graduates early in their senior fall semester to address their hiring needs. Our move to become an independent School is a significant stride towards addressing this imminent need, enhancing capacity to meet industry demand, and playing a pivotal part in securing our nation's infrastructure future.

Departmental Growth

Over the past two decades, the Department of Civil and Environmental Engineering has seen considerable growth, with undergraduate enrollment swelling from 150 in Fall 2003 to 390 in Fall 2023 (Figure 1). Further increases are projected for AY 24-25, with a commitment to the DOT to increase the civil engineering admissions by 10% in Fall 2024. Our Environmental Engineering Program, accredited in 2003, has grown from an initial 16 students to a current enrollment of 120. A minor degree in construction engineering and management was launched in response to feedback from the Industrial Advisory Board in the 2017-2018 academic year with an enrollment of 28, but now caters to 60 students. The department now offers three Ph.D. programs serving a total of 81 Ph.D. students, compared to 60 in 2013, as well as two master's of engineering degrees, and two graduate certificates.

Research expenditures have increased from \$5.3M in FY15 to \$12M in FY23 (Figure 1), placing us first in research expenditures in 2021 and 2022, and second in 2023 among 55 Storrs campus departments. This was achieved with consistent tenure-track faculty numbers, fluctuating between 22 and 23 in the past 10 years. We have added two full-time and two part-time assistant professors in residence to support

the teaching mission, and nine assistant research professors, who are funded by external sources. Our faculty members lead several successful research centers, including the Connecticut Transportation Institute, National Institute for Underwater Vehicle Technology and Eversource Energy Center. All these activities resonate with national emphasis on infrastructure, resilience, energy and sustainability, aligning with the University Strategic Plan.

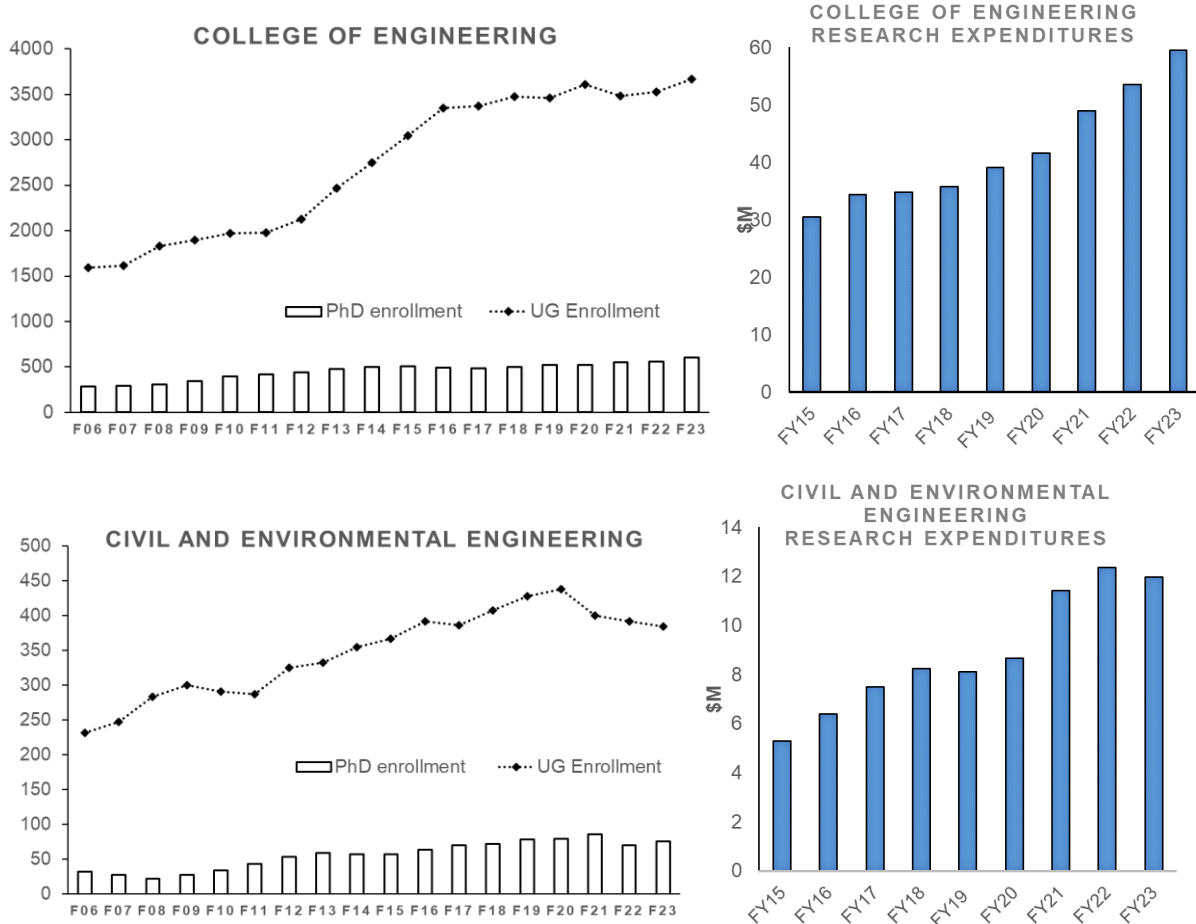


Figure 1: Growth in undergraduate, Ph.D. and research expenditures in the College of Engineering (top) and the Department of Civil and Environmental Engineering (bottom)

Vision Statement

As we confront the global challenges of urbanization and escalating environmental issues, civil and environmental engineering stand at the epicenter of constructing sustainable solutions for our future. Our vision for the School of Civil and Environmental Engineering (SCEE) commits to continuous improvement in engineering education and nurturing technically proficient, innovative, and publicly engaged engineers.

Recognizing engineers as public servants, we place a premium on their capability to be responsive to individual and community needs. Educating the public on infrastructure design options, prospects for

resilient growth, and methods for sustainable living becomes paramount in this context. ***Transitioning from a Department to a School will increase not only our visibility to industry and peer universities but also our capacity for large-scale collaborations.***

This change will facilitate a dynamic, interdisciplinary educational platform, designed to proactively address both immediate and future challenges in civil, environmental, and infrastructure engineering. It showcases a forward-thinking approach to education in civil and environmental engineering and encourages growing research efforts, thereby creating an adaptive learning environment that aligns with student aspirations, current and future societal needs, and the evolution of scientific knowledge.

Proposed Areas of Growth

The transition from a Department to a School of Civil and Environmental Engineering will inspire enhancements that increase the relevance and appeal of our educational offerings. These changes will strategically align with evolving engineering profession demands, the expectations of our stakeholders, and the diverse interests and abilities of our students.

Immediate Actions

Short term actions include the introduction of **specialized** tracks in our undergraduate civil engineering program and an accelerated 5-year Master of Science degree for all programs. Specializations in transportation engineering, structural engineering and water resources at the undergraduate level will allow students to take a direct, intense approach to their fields of interest. Additionally, in collaboration with Marine Sciences in CLAS, the introduction of a cross-college undergraduate minor in coastal engineering will better equip our students with essential skills and knowledge to navigate renewable energy and design for climate change.

The advancement of a five-year master's degree program represents a strategic choice to combine broad-based learning with specialized education. The 4+1 track will be based on existing courses and build upon the specialized tracks at the undergraduate level. All these changes will take effect in AY 25-26, as they require courses and curriculum approvals to go through during the AY 24-25.

These changes will be designed and executed in close collaboration with both state and industry partners, to seamlessly integrate experiential learning and professional opportunities and ensure that they are closely aligned with the workforce demands. The primary objective is to integrate exceptional students SCEE into the forefront of research conducted through our esteemed centers, namely, CTI, Eversource, and the National Institute for Undersea Vehicle Technology. This distinctive approach provides students with a seamless transition from their undergraduate to graduate studies, enriching their educational journey and simultaneously fostering mutual benefits for both the students and the research centers.

Medium-/Long-Term Objectives

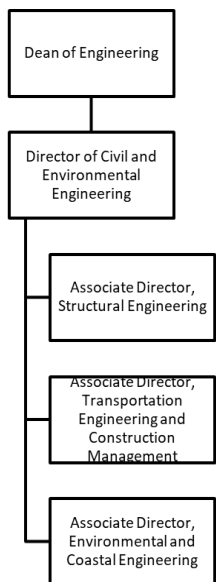
Long term (3-5 year) objectives –which are ambitious and will require additional resources, are aimed at further expansion and refinement of our academic programs. In response to increasing industry demands, we plan to elevate our construction management and coastal engineering minors to comprehensive major programs. Currently, the Northeast lacks a public R1 institution with a major dedicated to construction management and engineering, which opens an attractive prospect for

recruiting students from New England, New York, and New Jersey. Similarly, coastal engineering is only offered by the University of Rhode Island, and only a handful of universities nationwide, while climate-change induced needs are growing rapidly. Additionally, we plan to introduce an interdisciplinary minor in digital design and data visualization in engineering, preparing our students for the evolving technological landscape in the industry. Moving forward, our strategy includes nurturing our programs by tapping into recruitment networks at regional campuses, thereby enriching the diversity of students in our civil and environmental engineering courses, particularly targeting those with a passion for public service and making societal impacts.

As a primarily public-facing profession, we seek to expand our existing partnerships with CAHNR with Extension Faculty in Engineering. This will strengthen our commitment to community engagement within the profession and expand opportunities for service learning and outreach as part of both our curriculum and research endeavors. As the State of Connecticut's land-grant university, UConn has a responsibility to deliver innovative, research-based solutions to enhance the lives of the state's residents, businesses, and communities. The inclusion of extension services in this process will enable the dissemination of new concepts and knowledge, and feedback from amongst the public and potential beneficiaries, fulfilling our commitment to societal growth and development.

This expansion will also bolster our research enterprise and associated graduate programs, as the prestige of our academic and research programs are closely intertwined. Enhanced academic programs will amplify opportunities for partnering with governmental and industrial entities, attracting exceptional faculty specializing in innovative research domains, retaining top-tier graduate students, and increasing our university's presence in national discussions that shape the future of research and development. The transformation into a School of Civil and Environmental Engineering will empower us to amplify and diversify our initiatives, meeting the ever-increasing demands for interdisciplinary cooperation.

Structure and Timeline



The structure of the School will require no additional resources, with small changes in the existing structure. Currently, the Department operates with a Undergraduate Program Director and an Associate Head for Graduate Education, Research and Equity. The Environmental Engineering Program Director is a member of the Administrative Team but reports directly to the Dean of Engineering. In the new structure, there will be still three administrative roles, reporting to the School Director, who will in turn report to the Dean of Engineering, as shown in Figure 2. This change will take effect in AY 24-25 (August 23, 2024).

The bylaws of the department will be updated to reflect the new structure, with an anticipated approval date of March 6th, 2024.

Figure 2: Structure of SCEE