February 19, 2019

To: Appropriations Committee

Senator Catherine A. Osten, Co-Chair, Appropriations Committee
Representative Toni E. Walker, Co-Chair, Appropriations Committee
Senator Paul M. Formica, Ranking Member, Appropriations Committee
Representative Gail Lavielle, Ranking Member, Appropriations Committee

Senator Dennis Bradley, Co-Chair, Legislative Sub-Committee, Appropriations Committee
Representative Peter Tercyak, Co-Chair, Legislative Sub-Committee, Appropriations Committee
Representative Bill Simanski, Ranking Member, Legislative Sub-Committee, Appropriations Committee

REF: FY20/21 FUNDING REQUEST

Please find attached the following regarding the Connecticut Academy of Science and Engineering’s FY20/21 funding request:

♦ Testimony
♦ Funding Request
♦ Connecticut Academy of Science and Engineering: Case for Support

Thank you for your time and consideration.

Best Regards,

Richard H. Strauss
Executive Director
Email: rstrauss@ctcase.org

cc: Appropriations Committee Members
Senator Osten, Representative Walker, and members of the committee, on behalf of the Academy and its membership this request is for funding for FY20 and FY21 for the Connecticut Academy of Science and Engineering (CASE) to conduct in-depth projects/studies on high interest topics on behalf of the General Assembly.

Since 1976, the Academy has completed over 105 studies on a variety of issues, for the General Assembly and state agencies. In addition to the expertise provided by CASE Members, the Academy’s convening authority provides access to a wide range of independent expertise from technical experts from Connecticut and across the nation to address issues of importance and concern to Connecticut.

CASE provides perspectives not bound by organizational structure and culture. Many of the Academy’s projects have and will continue to provide the General Assembly and state agencies with objective guidance and advice regarding issues to support the development of practices, policies and law.

Attached please find CASE’s funding request and an overview of the Academy (Case for Support) including a listing of recent projects/studies conducted for the General Assembly, state agencies and others.

Thank you for your time and consideration.

Respectfully Submitted,

Richard H. Strauss
Executive Director
Email: rstrauss@ctcase.org
Purpose: Provide objective scientific and technical support to assist the General Assembly in their legislative mission.

Many public policy issues today have strong and, often, complex technical components that need to be carefully understood in crafting effective legislative initiatives. The Connecticut Academy of Science and Engineering (CASE) meets an important need by providing members of the General Assembly with objective, non-advocacy advice on technically complicated issues impacting the development of policies and law. CASE, founded in 1976 by act of the General Assembly, has legislatively mandated convening authority, expertise, and over 43 years of experience in providing expert, third party, objective perspectives and information to the General Assembly, state agencies and others.

PROPOSED GENERAL ASSEMBLY ACTION:

For budgeting and administrative purposes, contracting will be provided through the Office of Legislative Management; with content-related project oversight provided through the committee(s) of cognizance.

PROVIDE FUNDING FOR CASE TO CONDUCT A PROJECTS/STUDIES FOR THE GENERAL ASSEMBLY

- FY20 Funding Request: $400,000
- FY21 Funding Request: $400,000

This request is for funding for CASE to conduct projects/studies per year ($400,000 per year - FY20 and FY21) on topics of high interest to committees of the General Assembly. In addition, a carryover to the next fiscal of any unexpended funds authorized for such projects/studies is requested. The carryover provides for continuation of funding for projects/studies that begin in one fiscal year and completed in the next fiscal year. (NOTE: Due to timing of the availability of funds annually for contracting, studies frequently begin in one year and completed in the following fiscal year). A consultative process thru discussions with committee leadership will be utilized to select projects/studies to assure that the selected topics are of high interest, timely, and worthy of funding. The committee leadership will submit selected projects/studies to the Office of Legislative Management for contracting with CASE. Committees of cognizance on projects/studies will have an opportunity to review and provide feedback on the scope of work, be kept informed of progress and invited to attend project/study committee meetings.
CASE STATEMENT

Connecticut Academy of Science and Engineering
Providing a critical service for the citizens of Connecticut

Since its inception in 1976, the Connecticut Academy of Science and Engineering (the Academy) has pursued initiatives that are most important to the success and advancement of science and technology in the state of Connecticut. More than an honorific organization, the Academy provides concrete guidance to position Connecticut as a leader in science and technology. From conducting studies, to informing Connecticut citizenry on science and technology, to creating educational opportunities to promote the pursuit of science and technology education and careers, the Academy fills a unique and critical service to the state.

Comprising more than 400 members, the Academy is the only organization in Connecticut that brings together such a strong group of individuals representing a diverse cross-section of science and technology fields. The Academy is composed of leading scientists, physicians, engineers, and mathematicians who are experts in a wide range of industries, including agriculture, biomedicine, information systems, economic development, education, energy, environmental science, public health, and transportation. Together, they bring to the Academy a depth and breadth of scientific and technological expertise, experience, and reach that is unmatched.

Mission and Vision

The Academy is a non-profit, 501(c)3 institution patterned after the National Academy of Sciences to identify and study issues and technological advancements that are or should be of concern to the state of Connecticut. It was founded in 1976 by a Special Act of the Connecticut General Assembly.

Mission Statement

The Academy will provide expert guidance on science and technology to the people and to the state of Connecticut, and promote the application of science and technology to human welfare and economic well being. Every endeavor pursued by the Academy is driven by three primary goals:

- To provide information and advice on science and technology to the government, industry and people of Connecticut.
- To initiate activities that foster science and engineering education of the highest quality and promote interest in science and engineering on the part of the public, especially young people.
- To provide opportunities for both specialized and inter-disciplinary discourse among its own members, members of the broader technical community, and the community at large.

Vision

The Academy will foster an environment in Connecticut where scientific and technological creativity can thrive and contribute to Connecticut becoming a leading place in the country to live, work and produce for all its citizens, who will continue to enjoy economic well being and a high quality of life.
The Academy Advises Decision Makers with Balanced, Independent, Evidence-based Studies and Recommendations

Connecticut legislators and executive branch leaders make decisions about critical issues regarding transportation and infrastructure, the environment, energy, education, jobs, and the economy—issues that affect the citizens of Connecticut on a daily basis. To make these decisions, the Academy is relied on by the state to assemble independent experts from academia, industry, and government to ask the hard questions and frame the issues in a way that assures informed dialogue and debate, while offering recommendations and solutions for consideration.

The Academy provides timely information and recommendations on science and technology-related public policy issues so that policymakers have the objective technical advice to make knowledgeable and informed decisions in the best interest of Connecticut and its citizens.

As a technical resource, the Academy is an impartial, balanced, and reliable third party, and acts independently of any political agenda or corporate influence. It maintains a broad scope that balances evidence-based research with fresh perspectives that originate outside an organization’s structure and culture. These attributes represent the added value of the Academy’s advice and guidance to the state.

In fact, in 2018 the Academy was one of only nine organizations to receive a grant from the California Council for Science and Technology (CCST), in partnership with the Gordon and Betty Moore Foundation and the Simons Foundation, for the development of a Science and Technology Policy Fellowship Program for state-level legislatures, as well as being applicable for executive branch agencies. This Program will provide expert science and technology resources to inform public policy in Connecticut. It is a unique opportunity for scientists, technologists, and engineers to engage with policymakers for the purpose of providing analysis and research, assistance and advice, and evidence-based scientific skills to ensure science and technology are considered in development of policy and legislation.

“The Academy offers a deeper and broader level of expertise than many organizations are able to assemble internally, due to staffing and budget constraints. The Academy is extremely adept in wide-ranging areas of expertise, at synthesizing capabilities, and impartiality — and provides their services in a very cost-effective manner. At its core, the Academy’s value lies in its ability to assemble impressive teams of experts who are ready, willing and able to contribute to engineering, science and technology needs of the State of Connecticut.”

- James Sime, Former Manager of Research, Connecticut Department of Transportation
“The work that the Academy performed was instrumental in obtaining continued funding for the Connecticut Stem Cell Research Program. As an independent organization, the Academy was able to present credible recommendations for the continued funding of the program that were universally recognized as valid and impartial. The Academy was thus critical in ensuring that the Connecticut Stem Cell Research Program would be able to continue its position as a global leader in stem cell research.”

- Milt Wallack, Founder of the Connecticut Stem Cell Coalition and Board Member of the SCRAC

**Academy Study Validates Connecticut Stem Cell Research Program**

In 2005, Connecticut became only the third state in the nation to fund stem cell research with the establishment of the Stem Cell Research Advisory Committee (SCRAC) and the appropriation of $20 million for embryonic or human adult stem cell research.

In 2007, the Academy was asked to conduct a study on behalf of the Connecticut Department of Public Health (DPH) and Connecticut Innovations to provide guidance and advice on developing a strategic plan to ensure the long-term viability and sustainability of Connecticut as an International Center of Excellence for Stem Cell Research.

Additionally, in 2012 on behalf of DPH and Connecticut Innovations, the Academy took an objective, holistic view of the SCRAC, analyzing accomplishments of the program and its grantees to date and investigating its viability for making significant contributions to stem cell science in the future. The result of this study validated the achievements of the program, and made the recommendation for continued stem cell research in Connecticut, resulting in the appropriation of millions of dollars of additional funding for stem cell research in Connecticut.
“One of the reasons I found the Academy so valuable when I served in the Connecticut Department of Environmental Protection, and a reason I continue to be impressed with the Academy as a consultant, is that the Academy is irreplaceable in its neutrality and its ability to bring together a diverse, highly qualified group of independent experts on a subject. The Academy conducts its studies and presents its findings and recommendations in a way that educates and informs decision makers and stakeholders throughout its process. CASE makes highly scientific and technical information easily digestible, applicable, and extremely useful in decision making.”

-Jane K. Stahl, Environmental Consultant, Former Deputy Commissioner, Connecticut Department of Environmental Protection (now DEEP)

**Academy Study and Recommendations Improve Water Quality**

In 2013, the Connecticut Department of Energy and Environmental Protection (DEEP) requested the Academy conduct a study to evaluate and develop recommendations for the most effective scientific methods with which to measure phosphorus levels, project future levels and address the impacts of phosphorus pollution in inland, non-tidal waters in Connecticut. The study was part of a legislatively driven approach to resolving conflicts between regulators and municipal authorities arising from the costs associated with phosphorus reductions from waste water treatment facilities.

Specifically, the study looked at the impact phosphorus had on water quality, the approaches in place for measuring phosphorus impacts and complying with water quality standards, and appropriateness of the methodologies used in Connecticut to measure phosphorus impacts on water quality and aquatic life.

At the conclusion of the study, the Academy set forth a proposed set of recommendations to be pursued by the state for the subsequent 3-4 years, including method, frequency, timing and location of measurement, and recommendations for future studies. Several of those recommendations were adopted by DEEP in its state-wide strategy to reduce phosphorus in inland, non-tidal waters to comply with US Environmental Protection Agency (EPA) standards and protect the State’s water resources.
The Academy Strengthens Connecticut’s Student Science and Technology Programs

The Academy is committed to stimulating and sustaining youth engagement in Science, Technology, Engineering and Math (STEM) education and careers, and better serving groups historically underrepresented in STEM fields, including female, minority and socio-economically disadvantaged youth.

If the United States is to remain a global leader in an increasingly knowledge-based, technical, and globalized economy, it must continue to excel in STEM fields, encourage STEM education among its youth, and fill the void in the STEM workforce. According to the U.S. Department of Commerce, over the past ten years, careers in STEM grew at a rate of 17%, compared to other careers at a rate of 9.8%. Yet, few students pursue STEM fields, and there is a shortage of teachers skilled in those subjects.

The Academy supports a number of programs that promote and encourage interest in science and engineering among youth, including:

- Connecticut Science and Engineering Fair for middle and high school students, including the Fair’s Urban School Challenge
- Connecticut Invention Convention for grades K-12
- Connecticut Junior Science and Humanities Symposium for high school students

The Academy has awarded more than $190,000 to 500+ students in support of these science and technology competitions.

A vital endeavor of the Academy is support for the Connecticut Science & Engineering Fair’s Urban School Challenge (USC), which the Academy helped establish in 2012. The USC supports middle and high school students from underrepresented school districts to participate in the Fair in science research endeavors at a high level. Since 2012, more than 1,000 students have participated in the Urban School Challenge, with the Academy providing awards to 15 students. Academy support includes in-kind services such as project coaching and judging, formal recognition and honor at its annual meeting, and funding for awards and participation costs.

“I’m so profoundly grateful to the Academy. From a young age, the Academy helped inspire and direct my interest in environmental science. It provided me opportunities for which I will forever be thankful—winning awards, meeting accomplished scientists and engineers, sharing my passion for my research with a broader audience. The Academy shared its research and methods with me, which motivated me to approach my own research in new and fresh ways. The Academy has done more than encourage my love of science and provided me opportunities to follow my passion; it has also had an impact far beyond me. Thanks to the Academy, my high school has received funds to purchase new lab equipment—which will impact science education for not only me and my peers, but also future students.”

-Maya Geradi, Five-time Urban School Challenge Winner and Three-time Gerber Medal of Excellence Recipient
Academy Support of STEM Education and Interest: One Student’s Story

On June 18, 2018, Maya Geradi took the stage as valedictorian at Wilbur Cross High School. A lifelong resident of New Haven, Maya has attended public school in Connecticut her entire life. Maya plays the flute in her school marching band, enjoys kayaking and swimming, and writes skits for history competitions.

She is also a five-time Urban School Challenge winner, and a three-time recipient of the Gerber Medal of Excellence. Receiving the Gerber Medals also benefitted her high school, which received funding for lab equipment from the Academy.

In seventh grade, Maya won the Urban School Challenge for the first time, and as a result, was given the opportunity to attend Project Oceanology’s Ocean Camp. It was there that she was able to visit a waste water treatment plant, which sparked her interest in water purification technology and environmental engineering, two areas of science that continue to be her passion.

As her interest in science grew, she continued conducting experiments and research at her family’s kitchen table. Maya says one of her life’s greatest honors to date was attending the 43rd CASE Annual Meeting and Dinner and being invited to present to its accomplished members and guests the result of her research since middle school—some of which began right there at her kitchen table.

Through the awards Maya received, she attended and presented her research to scientists from around the world at national and international competitions with all expenses paid.

Winning the Urban School Challenge in eleventh grade had a profound impact on Maya. As a result of her award, she attended the Intel International Science and Engineering Fair, where she heard a keynote address by a professor from Stanford. He spoke of his desire to make research opportunities available to all students, regardless of geographic or socio-economic circumstances. It was this speech that inspired Maya to take her love of science in yet another direction: STEM outreach programs, especially in her home state of Connecticut.

In Fall 2018, Maya will enroll at Yale University where she intends to pursue her passion for environmental engineering by obtaining a double major in environmental engineering and economics. In the future, Maya hopes to continue her relationship with the Academy as a contributor to its studies. She also aspires to work with the Academy and other organizations engaged in outreach programs such as the ones she benefited from, to support and inspire the next generation of students.
The Academy Informs Connecticut’s Citizenry on Science and Technology

Topics

The Academy is dedicated to providing opportunities for discussion and collaboration among its members, the broader scientific and engineering community, academia, business and industry, government, and the public. To that end, it promotes ways to celebrate advances, stimulate interest, and educate the public—especially young people—in matters of science and technology.

The Academy supports the Connecticut Medals of Science and Technology, which are awarded by the state in recognition of outstanding contributions in scientific fields crucial to Connecticut’s economic competitiveness, environmental, and social well-being.

The Academy informs and educates the public by providing relevant, current content in local media. The “Science Matters” series is an online interactive classroom resource available through the Hartford Courant’s News in Education Program that teachers use to connect students to the news. The monthly articles in this series provided by the Academy address timely topics of interest to the public and is especially targeted to students to encourage interest in and pursuit of science and technology.

Through its Bulletin, the Academy provides relevant information to government, business leadership, and the public reaching more than 1,300 individuals on topics significant to Connecticut in terms of the application of science and technology to human welfare and economic well-being. The Bulletin promotes the exchange of scientific and technology-related technical and research information among various technical communities in Connecticut. Brief abstracts of current National Academy studies are highlighted in each edition and Connecticut’s informal science centers and science-rich institutions are spotlighted to increase the public’s awareness of these easily accessible resources.

“When working as a legislator in the Connecticut General Assembly, I relied on the Academy to provide a third-party opinion on issues. The information and recommendations the Academy provides are invaluable, and have a strong impact on the decisions at the legislative level. The Academy delivers objective, non-partisan, cost-effective recommendations legislators need to make informed decisions that consider all the issues. The Academy fills a gap that would otherwise go unfilled due to the very limited resources of the General Assembly.”

-Roberta Willis, Former State Representative, and Former Co-Chair, Higher Education and Employment Advancement Committee, Connecticut General Assembly
“The Academy plays a valuable role in Connecticut in that it exists independently of the government, yet functions as an informative strategic partner to legislative entities. By functioning outside the scope and influence of special interests, the Academy is especially effective at identifying pragmatic ways to accomplish the task at hand. It’s uniquely suited to assess a situation and offer a non-partisan perspective, objective research and impartial recommendations.”

- Michael McLachlan, Former State Senator, District 24, Connecticut General Assembly

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Academy Study Evaluates the Effectiveness of Skilled Workforce Programs to Meet Needs of Business and Industry Today and in the Future

In 2011, at the request of the Connecticut General Assembly, the Academy conducted a study to evaluate the value and effectiveness of state programs that provided businesses in Connecticut with a skilled science and technology workforce, and education programs that prepared students for STEM-related careers.

Specifically, the study was meant to ensure Connecticut maintained an agile, flexible workforce system that could respond to the needs of residents and businesses in an evolving economy.

To achieve this, the Academy assembled a team of national experts on workforce alignment, representatives from state agencies and state-based businesses, and educators to evaluate the state agencies and organizational structure in place and make recommendation for an effective, aligned workforce system that could adapt to the evolving needs of the workforce.

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The Academy’s support to STEM education through the Urban School Challenge has been a powerful mover for students from underprivileged areas. It simultaneously encourages their interest in STEM and offers them opportunities that they would not have had otherwise.

-Bob Wisner, Chairman of the Board, Connecticut Science and Engineering Fair; Academy Member and Academy Governing Council Member
Sample Recent Activities — Serving the State of Connecticut (2012–2018)

**In-Process Studies and Projects**

— Implementation of a Connecticut Science and Technology Fellowship Program
— Connecticut Medals of Science and Technology: selection of the Medal winners at the request of the Governor
— Hartford Courant: Partner in producing Science Matters series for the Courant’s Newspapers in Education Program
— Academy Bulletin – published semi-annually

**Completed Studies**

— Development of a Connecticut Science and Technology Fellowship Program (2018). *Funded by a grant from the California Council on Science and Technology*
— CTDOT: Strategies to Improve Transportation Project Deliverability (2016)
— General Assembly: Early Childhood Regression Discontinuity Study (2016)
— General Assembly: Connecticut Disparity Study - Phase 3 (2016)
— DEEP *(mandated by PA 12-155)*: Methods to Measure Phosphorus and Make Future Projections (2014)
— DPH: Connecticut Biomedical Research Program: Analysis of Key Accomplishments (2014)
— General Assembly: Connecticut Disparity Study - Phase 1 (2013); Phase 2 (2014)
— General Assembly: Health Impact Assessments (2013)
— CTDOT: Analyzing the Economic Impacts of Transportation Projects (2013)
— General Assembly: Workforce Alignment Study (“Strategies for Evaluating the Effectiveness of Programs and Resources for Assuring Connecticut’s Skilled Workforce meets the Needs of Business and Industry Today and in the Future”) (2012)
— CTDOT: Benchmarking Connecticut’s Transportation Infrastructure Capital Program with Other States (2012)

**Technical Reviews and Assessments**

— DPH: Biomedical Grant Proposal Review Project – *Assistance to DPH for the review of research grant proposals in the fields of heart disease and cancer, as well as other tobacco-related diseases. Funding for this grant program is provided through the state’s Tobacco Fund* (2009 - 2014)
— DPH and the Connecticut Stem Cell Research Advisory Committee (SCRAC) – Responsible for managing and overseeing the CT Stem Cell Research Program’s Peer Review Process (2012-2014)

**Strengthen Connecticut’s Student Science and Technology Programs**

— Celebrating the achievements of young scientists and engineers through the Academy’s Annual Student Awards Program, including the Urban School Challenge
— Serving on executive advisory boards for: Connecticut Junior Science and Humanities Symposium; and Connecticut Association for Mathematically Precocious Youth. Also, serving as a member of the school governance council for the University High School of Science and Engineering
How You Can Help the Academy Advance Science and Technology in Connecticut

The Academy remains a valuable asset that is committed and dedicated to pursuing initiatives that are most important to the success and advancement of science and technology for the government, industry, and people of Connecticut.

Today, the uncertainty of state funding is presenting unprecedented challenges to the future of the Academy. Without additional sources of funding, the Academy will cease to provide the studies, public information, and educational initiatives that benefit Connecticut and its citizens.

While members are assessed annual dues and voluntarily contribute to the Academy’s Endowment Fund, this funding does not fully support the day-to-day operating costs of the Academy. Your financial support enables the Academy to:

- Continue research that informs and educates legislative and executive branch decision makers on issues that impact the daily lives of citizens and industry in Connecticut
- Develop a strong workforce excelling in science and technology through initiatives that nurture and support youth
- Promote specialized and inter-disciplinary discourse among the technical community and the community at large for the benefit of human welfare and economic well being

To learn more or make your donation, visit www.ctcase.org

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