



## CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

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February 26, 2021

To: Appropriations Committee

Senator Catherine A. Osten, Co-Chair, Appropriations Committee, and Legislative Sub-Committee,  
Appropriations Committee

Representative Toni E. Walker, Co-Chair, Appropriations Committee

Senator Craig Miner, Ranking Member, Appropriations Committee

Representative Mike France, Ranking Member, Appropriations Committee

Representative Peter Tercyak, Co-Chair, Legislative Sub-Committee, Appropriations Committee

Senator Paul Ciccarelli, Ranking Member, Legislative Sub-Committee, Appropriations Committee

Representative David Wilson, Ranking Member, Legislative Sub-Committee, Appropriations Committee

REF: FY22/23 Funding Request; 5-Year Budget Plan

Please find attached the following regarding the Connecticut Academy of Science and Engineering's (CASE) FY22/23 funding request and, to assist in future planning, CASE's 5-Year Budget Plan:

- ◆ Testimony
- ◆ Funding Request
- ◆ Supplemental Materials
  - CASE Services, 2012 to present
  - CASE Selected Projects and Studies

Thank you for your time and consideration.

Best Regards,

Terri Clark  
Executive Director  
Email: [tclark@ctcase.org](mailto:tclark@ctcase.org)

cc: Appropriations Committee Members



# CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

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## TESTIMONY OF THE CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING BEFORE THE APPROPRIATIONS COMMITTEE OF THE CONNECTICUT GENERAL ASSEMBLY

**FEBRUARY 26, 2021**

Senator Osten, Representative Walker, and members of the committee, on behalf of the Connecticut Academy of Science and Engineering and its membership, thank you for providing us the opportunity to come before you. The Academy is a non-profit 501(c). It was chartered by Special Act 76-53 of the General Assembly. The Academy supports the state in two major ways related to our charter from Act 76-53 and thus requests funding for FY22 and FY23 for these two major components of our work. They are: 1) to conduct projects and studies on high interest topics on behalf of the General Assembly and 2) to continue to celebrate science and engineering in Connecticut. As requested by Appropriations Leadership, we have included in our funding request a forecast for funding requests through FY26.

Regarding our first major component, since 1976 the Academy has completed over 105 studies and projects for the General Assembly and state agencies on a variety of issues that addressed complex technical concepts to be considered in the development and implementation of public policy. In addition to the expertise provided by CASE Members for these studies and projects, the Academy's convening authority and our member networks provided access to a wide range of independent expertise from state, national, and international experts.

Regarding the second major component, CASE has always focused on people and the state's world class capabilities in science, engineering and technology. CASE is the only organization in the state that recognizes, celebrates and connects world class science and engineering talent. By virtue of the Academy's constantly evolving membership it remains current and vitally connected to the world's global scientific frontiers that will ultimately create the businesses and industries of the future.

In parallel with this oral testimony, we have submitted written testimony which specifies our funding request, along with two supplemental documents that provide a perspective on CASE's past work. These include a list of studies and projects from 2012 to the present, and a report on selected recent studies with testimonials and statements on the value provided by CASE as a result of our work.

We request this funding to assure that we can continue in our mission. CASE provides advice as requested by and in service to the General Assembly and state agencies for a fee, which represents CASE's primary source of revenue. With the fiscal crisis this source of revenue has been significantly impacted. We have been able to support the celebratory aspects of our work by being fiscally conservative, but can tighten no further and we will find it challenging to continue without state support.

Thank you for your time and consideration.

Respectfully Submitted,

Edmond Murphy, PhD

CASE Treasurer, Executive Committee Member and  
Governing Council Member; CASE Member since 2006

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**CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING**  
**FY22 and FY23 FUNDING REQUEST**  
**5 Year Funding Request – FY22 – FY26**  
*Celebrating Science and Engineering in the State of Connecticut and*  
*Providing Unbiased, Evidence-Based Science and Engineering Service to the General Assembly*

The Connecticut Academy of Science and Engineering (CASE; the “Academy”) was chartered by Special Act 76-53 of the General Assembly. CASE’s overarching purpose stated in §2 of the act is to “...foster science and engineering, to promote the application of science and engineering to human health and welfare, and to study and report upon any subject within its competence when appropriate.” CASE has remained steadfast in its adherence to this purpose since our founding in 1976, both as an organization that **celebrates our state’s excellence** in science and engineering and as a **service that provides unbiased, evidence-based advice** on policy, projects, and programs in service to the General Assembly and state agencies.

CASE provides advice as requested by and in service to the General Assembly and state agencies for a fee, which represents CASE’s primary source of revenue. The celebratory aspects of our work have been accomplished for several years without any support from the state by being fiscally conservative in the use of our ‘rainy day’ fund. However, we can tighten our budget no further and it will be challenging to continue without the state’s support.

This testimony includes the Academy’s request for budget line items for FY22 and FY23 in the two major areas of our work: celebrating science and engineering in Connecticut and conducting Science-related projects and studies for the General Assembly. Additionally, CASE respectfully submits a 5-year budget plan for your consideration in future planning.

**CELEBRATING SCIENCE AND ENGINEERING IN CONNECTICUT**

CASE respectfully requests the following line item budget to support this aspect of CASE’s work:

| FY22      | FY23      | FY24      | FY25      | FY26      |
|-----------|-----------|-----------|-----------|-----------|
| \$100,000 | \$103,000 | \$106,000 | \$109,000 | \$112,000 |

The FY22 and FY23 requests are for the current budgeting period. Values have been increased 3% annually for inflation. Per request from the appropriations leadership, we have included forecasted requests for FY24-FY26.

This funding will support a portion of CASE staff (0.8 FTE) for the celebratory components of CASE’s work listed below. In toto, these activities meet our state mandated charter: “... to foster science and engineering, to promote the application of science and engineering to human health and welfare”.

- **CASE Membership:** CASE honors many of the most accomplished scientists, engineers, technologists, physicians, and mathematicians through an annual call for nominations and rigorous election process, leading to membership in CASE. The Academy currently has 430 members from academia, business and industry, and government, with 69 of those members also members of the National Academies. Our members are recognized for excellence in the state, and also nationally and internationally. [Public Listing of CASE Members](#), which includes our current membership, as well as corresponding, emeritus and honorary members.
- **CASE Annual Meeting:** The annual meeting includes an introduction of the new members of the Academy, bestowing of CT Medals of Science and Technology, recognition of top middle and high school students from Connecticut science- and engineering-related competitions, recognition of distinguished member service and honorary members, and a keynote address. The Academy will hold its 46<sup>th</sup> Annual Meeting on May 27, 2021. For more, see [CASE Annual Meeting](#)
- **CASE Bulletin:** An electronic newsletter transmitted six times per year. The *Bulletin* is focused on celebrating and sharing news about our state’s rich and diverse science, technology, engineering, medical, and mathematics resources. The *Bulletin* also highlights studies on a variety of topics from the National Academies, as well as news about CASE. For the most recent issue, [CASE Bulletin, Feb. 2021](#)
- **CASE Podcast Series** on CT Science and Engineering: This series is under development, with the first edition expected to be released by May 2021, with then 6 editions each fiscal year. The series will celebrate and increase visibility for science, technology, engineering, medicine and mathematics achievements in

Connecticut.

- **CASE Social Media:** CASE has a LinkedIn page and weekly posts celebrating the accomplishments of our members, state achievements, and current news of note. Access via LinkedIn; Search for Connecticut Academy of Science and Engineering.
- **Connecticut Medals of Science and Technology:** Modeled after the National Medals of Science, and of Technology and Innovation, these awards are bestowed (rotates each year between the science medal and the technology medal) by the state of Connecticut, with CASE administering the call for nominations, the selection process, the bestowing of the medal and recognition of the recipient. See [CT Medals](#)
- **Middle and High School STEM Student Recognition:** CASE provides awards and recognition for the top student winners from the Connecticut Science and Engineering Fair, including the Urban School Challenge Program, the Connecticut Junior Science and Humanities Symposium, and the Connecticut Invention Convention. For more, see [CASE Student Awards](#)
- **Science Matters! Series, Hartford Courant, Newspaper in Education:** CASE facilitates the Science Matters Series on behalf of the Hartford Courant, with 9 articles per year. The articles are written by scientists and engineers, and focused on inspiring middle and high school students to consider careers in Science and Engineering. The Hartford Courant distributes via its digital edition to schools throughout Connecticut. See Hartford Courant, [Science Matters!](#)
- **Identifying Opportunities for Collaboration and Partnership:** CASE offers support and use of our organization as leverage to strengthen initiatives of the state for the social and economic well-being of its residents. Our members are recognized within Connecticut, but also are connected nationally and globally, and add a unique value in support of the state.

#### CONDUCTING PROJECTS AND STUDIES FOR THE GENERAL ASSEMBLY

CASE respectfully requests the following line item budget to support this aspect of CASE’s work:

| FY22      | FY23      | FY24      | FY25      | FY26      |
|-----------|-----------|-----------|-----------|-----------|
| \$100,000 | \$103,000 | \$106,000 | \$109,000 | \$112,000 |

The FY22 and FY23 requests are for the current budgeting period. Values have been increased 3% annually for inflation. Per request from the appropriations leadership, we have included forecasted requests for FY24-FY26.

Fiscal year funding requests will support annually one significant study or project, or multiple, more narrow in scope, projects and/or studies, with additional information as follows:

Many public policy issues often include complex technical concepts for consideration. CASE’s membership and their far-reaching networks make accessible a rich and diverse perspective that provides guidance in the development and implementation of public policy. As originally envisioned, CASE was founded in part to assist by providing members of the General Assembly and state agencies with unbiased, evidence-based advice. And, by mandate through Special Act 76-53, CASE has legislatively mandated convening authority, and over 45 years of providing expert, third party, objective perspectives and information to the General Assembly and state agencies.

CASE will serve committees of the General Assembly on a topic(s) of high interest. A consultative process through discussion with committee leadership will be utilized to select projects/studies to assure that the 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.

Of note, 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 complete 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).

# CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

The Connecticut Academy of Science and Engineering (CASE) was founded in 1976 by Special Act of the General Assembly with its mission and principles patterned after the National Academy of Sciences.

## RECENT ACTIVITIES 2012 — 2020

### ➤ IN-PROCESS PROJECTS

- Implementation of a Connecticut Science and Technology Fellowship Program. Inaugural fellowship is a two-year project for the Connecticut Department of Energy and Environmental Protection on Emerging Contaminants/Per- and Polyfluoroalkyl substances (2019 – present)
- Connecticut Medals of Science and Technology: facilitate the call for nomination, selection, celebration on behalf of the Office of the Governor (1995 – present)
- *Hartford Courant*: Production of the Science Matters series for the Courant’s Newspapers in Education Program (2005 – present)
- Academy Bulletin (30+ years)
- Academy Annual Meeting: Celebration of STEM (45 years)

### ➤ COMPLETED STUDIES AND PROJECTS

- Academy Position Paper: *An Adaptive Risk-Based Strategy for Connecticut’s Ongoing COVID-19 Response* (2020)
- Connecticut Science and Technology Fellowship Program – Development (2018): *Funded by a grant from the California Council on Science and Technology*
- CTDOT: Sustainability Strategies to Minimize the Carbon Footprint for Connecticut Bus Operations (2018)
- CTDOT, in collaboration with CTDMV: Development of a Virtual Screening Facility Pilot Project for Connecticut’s Commercial Vehicle Enforcement Program (2017)
- CTDOT: Strategies to Improve Transportation Project Deliverability (2016)
- General Assembly: Early Childhood Regression Discontinuity Study (2016)
- General Assembly: Connecticut Disparity Study - Phase 3 (2016)
- CTDOT (*mandated by General Assembly - PA 14-199*): Winter Highway Maintenance (2015)
- General Assembly: Addressing Family Violence in Connecticut (2015)
- General Assembly: Shared Clean Energy Facilities (2015)
- Albertus Magnus College (on behalf of the Office of Higher Education): External Evaluation of Project CCSS: STEM (Common Core State Standards – Science, Technology, Engineering and Mathematics) (2015)
- DEEP (*mandated by PA 12-155*): Methods to Measure Phosphorus and Make Future Projections (2014)
- CTDOT: Energy Efficiency and Reliability Solutions for Rail Operations and Facilities (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)
- DPH & Connecticut Innovations: Connecticut Stem Cell Research Program Accomplishments (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)
- CTDOT: Alternative Methods for Safety Analysis/Intervention for Contracting Commercial Vehicles & Drivers in CT (2012)

# CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

## ➤ TECHNICAL REVIEWS AND ASSESSMENTS

- Eastern CT State University, Institute for Sustainable Energy: Review of Health Impact Assessment municipal projects as part of the Sustainable CT program (2019 – present)
- 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)*
- DEEP: Peer Review: CL&P/UConn Report on Emergency Preparedness and Response at Selective Critical Facilities (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. The Academy recognizes the top student winners, their teachers and schools from the CT Science & Engineering Fair and the fair’s urban challenge program, the Connecticut Junior Science and Humanities Symposium, and the Connecticut Invention Convention.
- Serving on executive advisory boards for: Connecticut Junior Science and Humanities Symposium and the Connecticut Science and Engineering Fair; Serving on the University High School of Science and Engineering school governance council

### **For more information:**

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## SELECTED ACTIVITIES 2012 — 2020

### ➤ Connecticut Department of Energy and Environmental Protection: *DEEP Science & Technology Policy Fellowship Program (in process)*

**Brief Description:** CASE has in place a two-year Fellowship at the Connecticut Department of Energy and Environmental Protection on Emerging Contaminants/Per- and Polyfluoroalkyl substances - PFAS (2019 – present). The purpose of DEEP's fellowship is to provide a highly qualified scientist to serve as an advisor to the agency on the development/implementation of a state PFAS Strategy, while in parallel providing the Fellow with policy making experience

**Academy's Work Effort:** Manage nationwide recruitment process and selection process, support Fellowship placement, handle operational logistics related to independent consultant placement (stipend/expenses), and provide Fellow learning/professional development opportunities.

**Agency Comments: Betsey Wingfield, Deputy Commissioner, Environmental Quality Branch, DEEP:** *The CASE fellow has been a critical member of our team as we drafted and are implementing a PFAS Action Plan as requested by Governor Lamont. Having a scientist of this caliber added to our technical competency. In addition, the link between science and public policy has never been more important and the fellowship is an important part of building and maintaining that bridge.*

### ➤ Connecticut Department of Energy and Environmental Protection: *Methods to Measure Phosphorus and Make Future Projections (2014)*

**Brief Description:** The objective of the study was in support of Public Act 12-155, which was to conduct an evaluation and develop recommendations to determine the scientific methods with which to measure the impacts of phosphorus pollution in inland, non-tidal waters.

**Academy's Work Effort:** Comprehensive literature review, interviews, guest speaker presentations, engagement with DEEP and working groups/stakeholders, development of conceptual models, and a review of methodologies necessary to recommend an approach for the state in compliance with EPA.

**Agency Comments: Betsey Wingfield, Deputy Commissioner, Environmental Quality Branch, DEEP:** *CASE's work with DEEP and a team of stakeholders on a study of Methods to Measure Phosphorus and Make Future Projections was critical to public acceptance of DEEP's innovative strategy to address phosphorus pollution in inland waters in a practical and cost effective manner. I am pleased to say that the necessary upgrades to wastewater treatment plants to remove phosphorus are underway – providing construction jobs and the promise of significant future environmental improvement.*

### ➤ Connecticut Department of Public Health and Connecticut Innovations: *Guidelines for Developing a Strategic Plan for Connecticut's Stem Cell Research Program (2007); STEM Cell Research Program Accomplishments (2013)*

**Brief Description:** In 2007, the Academy conducted a study for DPH and Connecticut Innovations (CI) 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. In 2013 DPH and CI contracted with the Academy to analyze program accomplishments to date.

**Academy's Work Effort:** Literature review, benchmarking against other state programs and alignment with federal grantmaking programs, review of annual and final stem cell research program reports and grant reports, collection of data on the impact of the program in Connecticut, and interviews with institutional stem cell leadership and grant recipients.

**Comments on Study: Milt Wallack, Founder of the Connecticut Stem Cell Coalition and Board Member of the Stem Cell Research Advisory Committee**

# CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

*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.*

## ➤ **Connecticut Department of Transportation: General Comments on Study Approach**

**Agency Comments: Edgardo D. Block, Research and Performance Management lead, CTDOT**

*The Connecticut Department of Transportation (CTDOT) has engaged with CASE for many years, relying on its unique study process and its ability to take on research questions that span the range of transportation topics as well as those that are cross-disciplinary in nature. This engagement provides CTDOT leadership and management a way to explore new approaches and methods that can be considered for application within the department. The process includes working with leadership to set the scope of work, and then presenting on a periodic basis the research conducted including literature reviews, identification of best practices, benchmarking, interviews and surveys, presentations by leaders in the field, modeling and simulation, and other means to provide the data and information needed to formulate evidence-based and independent findings and recommendations. The final result, a study report and briefing, is helpful, but the process is equally useful for those involved as it expands their understanding and the network they can engage with, including staff in other DOT's, research institutions, and companies. Studies are iterative, with opportunities to adjust based on what is learned throughout the process.*

## ➤ **Connecticut Department of Transportation Highlighted Studies:**

### 1) **In collaboration with the Connecticut Department of Motor Vehicles:**

#### **[Development of a Virtual Screening Facility Pilot Project for Connecticut's Commercial Vehicle Enforcement Program \(2017\)](#)**

**Brief Description:** The objective of the study was to create an implementation document for development of a virtual electronic screening and weight-in-motion pilot project

**Academy's Work Effort:** Review and analysis of current literature and best practices of selected states, CTDOT and CTDMV project meetings, site visits, mobile enforcement observations, and investigation of new, cost-effective technologies

### 2) **[Winter Highway Maintenance \(2015\)](#)**

**Brief Description:** The objective of the study in support of Section 6 of Public Act 14-199 was to conduct an analysis of the corrosive effect of chemical road treatments on vehicles, infrastructure, and the environment.

**Academy's Work Effort:** Examination of the impact of winter maintenance operations in Connecticut and regionally, review of best practices and new approaches, investigation areas for regional cooperation, and summary of past and current practice

**Agency Comments: Edgardo D. Block, Research and Performance Management lead, CTDOT**

*Of the many studies conducted, I would like to highlight the invaluable contribution of CASE to winter maintenance in "Winter Highway Maintenance Operations: Connecticut (2015)," and in "Innovative Technology Deployment: Development of a Virtual Screening Facility Pilot Project for Connecticut's Commercial Vehicle Enforcement Program (2017)" which has proven instrumental to both the CTDOT and the DMV as we consider implementation. These are but examples of the kind of value that the CASE engagement has provided to the Connecticut Department of Transportation over the years.*

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# CONNECTICUT ACADEMY OF SCIENCE AND ENGINEERING

## ➤ Connecticut General Assembly: [Early Childhood Regression Discontinuity Study \(2016\)](#)

**Brief Description:** The purpose of the study was to investigate the immediate effects associated with children who attend Connecticut's state-funded School Readiness full-day or school-day prekindergarten program.

**Academy's Work Effort:** Use of a regression-discontinuity statistical approach (used when there is a clear external means of distinguishing between two groups in such a way that the only difference between these groups is that some get a "treatment" and some do not) to determine the immediate effects of the state's school readiness program. To conduct the analysis, assessments were administered and collected from 529 students.

**Agency Comments: Beth Bye, Commissioner of the Office of Early Childhood**

The findings of the study show evidence that attending state-funded prekindergarten programs in Connecticut, as delivered through the School Readiness program funding stream, positively impacted children's early literacy and early numeracy skills. The Office of Early Childhood was able to use these results to support our work regrading early learning and development standards and efforts to support teacher training and technical assistance in early reading and mathematics learning aligned to standards.

## ➤ Connecticut General Assembly: [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 \(2012\)](#)

**Brief Description:** The General Assembly tasked the Academy with studying the workforce alignment system in Connecticut. The impetus was realignment of the workforce system following the Great Recession. Committees of cognizance included the Higher Education and Employment Advancement Committee, Commerce Committee, Education Committee, and the Labor and Public Employees Committee.

**Academy's Work Effort:** Gather data and information; be informed via presentations by national experts and representative of state agencies and state-based businesses, and educators; interviews; and focus group sessions conducted throughout the state including representation from secondary and higher education, state agencies, labor and trade associations, the regional workforce investment boards, and industry representatives from small to large manufacturers, healthcare, the nonprofit sector, and technology firms.

**Legislator Comments: Roberta Willis, Former State Representative and Former Co-Chair, Higher Education and Employment Advancement Committee, Connecticut General Assembly**

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.