

ESCOP Science & Technology: <http://escop.info/committee/scitech/>

12/07/2020

4 pm ET, via Zoom

(<https://us02web.zoom.us/j/83605080050?pwd=TmZDNEtXL3pVMYtmNDhDT1JXdEEwZz09>) or
1 669 900 9128 Meeting ID: 836 0508 0050 Passcode: 319119)

Committee Members:

<p>Chair: Jody Jellison (NERA) Past Chair: Laura Lavine (WAAESD)</p> <p>Delegates: Alton Thompson (ARD) John Yang (ARD) Joe Colletti (NCRA) Bill Barker (NCRA) Indrajeet Chaubey (NERA) Mark Hutton (NERA) Susan Duncan (SAAESD) Nathan McKinney (SAAESD) Gene Kelly (WAAESD) Chris Davies (WAAESD)</p> <p>Executive Vice Chair: Bret Hess (WAAESD ED) Saige Zespy (WAAESD Recorder)</p>	<p>Liaisons: Robert Matteri (ARS) Wendy Powers (ECOP) Tim Conner (NIFA) Jim Farrar (NIPMCC) Tim Killian (SSCC)</p>
--	---

Agenda:

1. **Welcome** – Jellison
2. **Roll Call** – Hess
3. **Approval of meeting notes from 11/02/2020** – Jellison
4. **Changes to the Call for Multistate Research Award Nominations** – Hess
5. **Liaison Updates, as needed**
 - ARS
 - ECOP
 - NIFA
 - NIPMCC
 - SSSC
6. **Establishing 2021 Priorities**
 - Recap of Ideas from 11/02/2020** – Jellison
 - More Immanent Topics** – Jellison
 - Information for AHS-CARET Infrastructure**

The Gordian report demonstrates the need to address significant deferred maintenance. Examples of additional information that might be useful would be answers to the following questions:

What future science would be enabled with such an investment?

How will such an investment contribute to combatting climate change?

What types of capabilities are not in our buildings and facilities that need to be to do this work?

How will new facilities advance animal production, food science and nutrition, bio-based product or energy science, and agricultural sustainability?

How will such an investment enable agricultural and food scientists to conduct research in the Big Data space (data analysis, enable AI applications, and contribute to high-tech ag innovations)?

How would investments create opportunities for economic growth?

What facilities are needed to address key challenge areas identified in the ESCOP Science Roadmap?

What facilities would enhance the system's capability to recruit an excellent and a diverse talent pool in agricultural science?

What is the role of outlying stations in addressing these challenges?

7. Next Scheduled Meeting(s) – Jellison

Schedule reoccurring meetings – Jellison

Does 4-5 pm Eastern the first Monday of every month work or should we go back to 4-5 pm Eastern the fourth Monday of every month?

ESCOP Science & Technology: <http://escop.info/committee/scitech/>

12/07/2020

4 pm ET, via Zoom

(<https://us02web.zoom.us/j/83605080050?pwd=TmZDNEtXL3pVMYtmNDhDT1JXdEEwZz09>) or 1 669 900 9128 Meeting ID: 836 0508 0050 Passcode: 319119)

Committee Members:

<p>Chair: <i>Jody Jellison (NERA)</i></p> <p>Past Chair: Laura Lavine (WAAESD)</p> <p>Delegates: <i>Alton Thompson (ARD)</i> <i>John Yang (ARD)</i> <i>Joe Colletti (NCRA)</i> <i>Bill Barker (NCRA)</i> <i>Indrajeet Chaubey (NERA)</i> <i>Mark Hutton (NERA)</i> <i>Susan Duncan (SAAESD)</i> <i>Nathan McKinney (SAAESD)</i> <i>Gene Kelly (WAAESD)</i> <i>Chris Davies (WAAESD)</i></p> <p>Executive Vice Chair: <i>Bret Hess (WAAESD ED)</i> <i>Saige Zespy (WAAESD Recorder)</i></p>	<p>Liaisons: <i>Robert Matteri (ARS)</i> <i>Wendy Powers (ECOP)</i> <i>Tim Conner (NIFA)</i> <i>Jim Farrar (NIPMCC)</i> <i>Tim Killian (SSCC)</i></p> <p>Regional Directors: <i>Rick Rhodes (NERA)</i></p>
--	--

Agenda:

1. [Welcome](#) - Jellison
 2. [Roll Call](#) - Hess
 3. [Approval of Meeting Notes from 11/2/2020](#) - Jellison
 4. [Changes to the Call for Multistate Research Award Nominations](#) - Hess
 5. **Liaison Updates**
 - a. [ARS](#) - Matteri
 - b. [ECOP](#) - Powers-Schilling
 - c. [NIFA](#) - Conner
 - d. [NIPMCC](#) - Farrar
 - e. [SSCC](#) - Killian
 6. **Establishing 2021 Priorities**
 - a. [Recap of ideas from 11/02/2020](#) - Jellison
 - b. [More Immanent Topics](#) - Jellison
 - i. **Information for AHS-CARET Infrastructure** - Jellison
 7. [Next Scheduled Meeting](#) - Jellison
- [Action Items](#)

Minutes:

1. **Welcome** – Jellison
 - a. Jody welcomed everyone to the meeting, expressing appreciation for folks attending another Zoom meeting in world of many Zoom meetings.
2. **Roll Call** – Hess
 - a. Saige will capture the list of attendees from the list of Zoom attendees. Attendees are italicized in the matrix above and include Jody Jellison (NERA), Alton Thompson (ARD), John Yang (ARD), Joe Colletti (NCRA), Bill Barker (NCRA), Indrajeet Chaubey (NERA), Mark Hutton (NERA), Nathan McKinney (SAAESD), Chris Davies (WAAESD), Robert Matteri (ARS), Wendy Powers (ECOP), Tim Conner (NIFA), Jim Farrar (NIPMCC), Tim Killian (SSCC), and Rick Rhodes (NERA), as well as Bret Hess (WAAESD ED) and Saige Zespy (WAAESD Recorder).
3. **Approval of meeting notes from 11/02/2020** – Jellison
 - a. After ensuring that a quorum was present, Jody asked for concerns, clarifications and changes on the minutes.
 - b. Bill Barker moved approval of the minutes as submitted. Joe Colletti seconded the motion, as did Indrajeet Chaubey. The motion was approved unanimously, without opposition.
4. **Changes to the Call for Multistate Research Award Nominations** – Hess
 - a. Bret reported that the changes to the Call for Multistate Research Award Nominations recommended by STC were approved by the Chair's Advisory Committee, with one change made from the November meeting. More description was inserted based on the definition of short-term, medium-term and long-term outcomes.
 - b. Additionally, descriptions were provided to differentiate outcomes from impacts.
5. **Liaison Updates, as needed**
 - a. **ARS - Robert Matteri**
 1. Bob reported that things are relatively quiet at ARS, as the holidays approach.
 2. Appropriations
 - a) There is a consistent wait to see what's going to happen on the budget. The House mark-up of Ag Appropriations has been available since July.
 - b) The Senate does not have a subcommittee mark-up, but explanatory notes are similar to mark-up. It is all available only.
 3. Transition teams are working within ARS. Currently, they are in the beginning phases of starting the transition process.
 - a) There is significant discussion on who the next Secretary of Agriculture will be. Some names tossed around have been Heidi Heitkamp, Marcia Fudge, Kathleen Merrigan, Arturo Rodriguez and Tom Vilsack. Bob noted there are lots of interesting possibilities, and they anticipate to see the list of names narrow down.
 - b) There is no timeframe that has been made available to the public on selecting a secretary.

4. The Ag Innovation Agenda has also been a topic of the STC.
 1. John Dyer has been hired by ARS Pacific West Area, and Bob noted he could arrange a time for John to present to STC about the continued efforts of the project.
5. Questions
 1. Bill asked whether the Ag Innovation Agenda will survive the change of administration.
 1. Bob noted that the AIA is a solid goal and solid plan, which helps to increase likelihood of transition of the agenda.
 2. Bob further emphasized that John Dyer would likely provide the best information.
 1. Bret asked whether John will be available, particular as his detail comes to a close, and Bob noted that he may or may not continue as point of contact for the AIA.
 3. Additionally, Bob said there is a lot that is unknown, particularly in light of the transition with administration.
 4. Bret noted that climate is one of President-Elect Biden's initiatives, meaning that reduction of environmental blueprint is likely to remain in the list of high priority items.
 1. Bill noted this may be a good chance to talk about regenerative agriculture.
 2. Bob agreed with Bret, noting that President-Elect Biden will focus on climate change at the forefront of the national agenda.

b. ECOP - Wendy Powers-Schilling

1. Chris Watkins, the ECOP chair, has identified Urban Extension; and Diversity, Equity and Inclusion as his top priorities. DEI includes not only within Extension, but within program participants
2. A webinar on the topic be hosted the first week of December, and future actions will likely begin to emerge.
3. Wendy note that ECOP is talking about its Impacts document in preparing for Hill visit.
 1. They are working to refocus the document to talk about impacts, rather than numbers, specifically.
 2. ECOP hopes to have each state provide impacts outside of just numbers.
4. CDC has approached Extension, seeking ways to improve the number of people getting vaccinated, whether that is for the flu or COVID.
 1. Wendy sees opportunities to work with CDC, particularly as they focus on farm worker safety.
5. Questions

1. Jody asked if there has been discussion about communication through community outreach groups, etc.
 1. Wendy noted that the nutrition programs may be a key method to get the information out, particularly since those programs are offered through multiple languages.
 2. They may also be able to use 4-H as a tool to help get the message out.

c. NIFA - Tim Conner

1. As an end-of-the-year summary, Tim noted that staffing levels are at 202, which is a significant milestone.
 1. The first phase was grants and administrators; second was scientific staff; and third was the leadership team.
 1. Deb Hamernik is deputy director at NIFA.
2. Lately, NIFA has focused on Project CAFÉ activities.
 1. First, they got the money out the door, and they have been working on continuous improvement.
 1. The new NIFA reporting system has been launched and is rolling out. They hope that the POW system is more straightforward now.
 1. Tim noted that NIFA is seeking feedback on these systems.
 2. SPIRA is now fully implemented.
 1. This system provides advanced notification for RFAs. The schedule is available now, and provides a schedule of when RFAs will be released.
 1. Ideally, this process will help staff and PIs be able to plan their schedules around classes and vacations.
 3. A COVID-19 RFA has been launched and completed.
 1. They do not plan to re-launch another COVID-19 RFA, but rather integrate those projects.
 2. The agency awarded \$14 million to about 31 projects.
 3. While it will be awhile before the impacts of those projects are pinned down, the projects have been awarded and funded.
 3. The agency is beginning transition team efforts.
 1. Parag Chitnis and Kate Fink are the points of contact for transition teams. They are in communication with REE, who is in contact with the OSEC office.
 2. A number of white paper requests for climate has come through Tim's office, and he sees that continuing.
 1. NIFA hopes to continue moving things forward, particularly since many things can be re-framed to hit the administration's priorities.
 4. Questions
 1. Future of the director's position?

1. Parag is expecting to be in the role of interim director until mid-summer 2021.
2. Parag has been unable to share information (if he knows)
3. The small size of the agency means that they are often overlooked until the end.
 1. The agency is looking forward to some stability, however, particularly in light of recent changes.
2. Is NIFA still virtual?
 1. The agency is still 100 percent virtual, with the exception of political appointees or acting appointees.
 2. Otherwise, the agency is virtual (~98%).
3. Is there an expectation to return to the office at Kansas City?
 1. NIFA has not yet started Phase 1 of reopening, and moving into offices doesn't come until Phase 3.
 2. Tim noted he does not anticipate much in-person work until a vaccine is readily available.
 1. Kansas is not doing well in the trend for COVID infections.
 2. 7/8 counties monitored are consistently trending upwards.

d. NIPMCC - Jim Farrar

1. Jim noted that NIPMCC doesn't have anything new to report.
2. NIPMCC continues to work on the three white papers they have been developing.

e. SSCC - Tim Killian

1. Tim noted he has no report from SSCC.
2. He will be contacting the Chair, with a report expected for January.

6. Establishing 2021 Priorities

• **Recap of Ideas from 11/02/2020 - Jellison**

- Jody noted that Moses Kairo joined STC during their November 2 meeting to review some of his priorities in detail.
 - Among important topics, Kairo highlighted addressing ESCOP's imitative to implement regional research to address the USDA Science Blueprint.
 - He also added that there are opportunities to identify areas of potential collaboration between 1862s, 1890s, and 1994s. Kairo also sought help from STC on identifying lessons learned from COVID-19 and how ESCOP can be more strategically prepared in the event of future crises.
- Jody also noted significant discussion about roadmaps, blueprints, etc. One opportunity arising from the conversation was the change to provide case studies that could be shared with Congressional delegations.
 - Jody mentioned she sees this idea as very, very powerful. The project could be completed with the partnership of the Communications and Marketing Committee.

- Jody further added that STC has discussed doing a gap analysis in the past.
- Additionally, infrastructure needs are a topic of continued conversation, and the needs are particularly timely.
- Jody explained that each of the potential topics are worthy of continued conversation, but STC should narrow down a few areas to focus on.
- **More Immanent Topics – Jellison**
 - **Information for AHS-CARET: Infrastructure**
 - Jody noted that Bret provided a list of questions for the group to consider in developing their ideas to work forward:
 - What future science would be enabled with this infrastructure investment? How will such an investment contribute to combatting climate change?
 - What types of capabilities are not in our building and facilities that need to be, to do this work?
 - How will new facilities advance animal production, food science, nutrition, bio-based products or energy science, and agricultural sustainability?
 - How will such an investment enable agricultural and food scientists to conduct research in the Big Data space: data analysis, enable AI applications, and contribute to high-tech ag innovations?
 - How would investments create opportunities for economic growth?
 - What facilities are needed to address key challenge areas identified in the ESCOP Science Roadmap?
 - What facilities would enhance the system’s capability to recruit an excellent and a diverse talent pool in agricultural science?
 - What is the role of outlying stations in addressing these challenges?
 - Jody added that the role of AES sites in both research and outreach is important, and she noted that AES sites also host ARS researchers, enhancing collaboration between agencies.
 - To begin the conversation, Jody suggested an initial idea of creating a deliverable that advocates for infrastructure improvements within the system. Such improvements would improve the resiliency in food systems and improve the ability of land-grant universities to research, educate, and do outreach.
 - Jody sees immense opportunities - and a very timely nature - of the project because facilities of U.S. land-grant universities (as identified by the Gordian-Sightlines study refresh) are very large.
 - Further states, including Massachusetts, have been willing to invest in infrastructure to provide stimulus to local economies.
 - Joe noted that he also agrees with the idea, suggesting that perhaps the projects should be approached in an incremental

fashion, starting with \$1 billion, then asking for \$5 billion, rather than seeking the whole sum at once.

- Bill Barker, however, believes that it would be worthwhile to seek the whole \$11.4 billion sum at once, since the amount is relatively small, on a grand scale.
 - Alton agreed that it will be important to ask for the whole sum.
- Jody, however, noted that STC likely would not be involved or consulted in this decision, and rather should focus on advocacy on the importance of the investment and prioritizing the investment.
- Joe mentioned that infrastructure allows research, education, and outreach to happen, meaning infrastructure is of utmost importance. However, many pieces are not going to be brand new or earth shattering. They will, however, provide boots-on-the-ground space for the work to happen.
 - Mark added that, in Maine, scientists are urged to solve 22nd Century problems on 19th Century equipment, making a strong argument for infrastructure improvements.
 - Chris emphasized that infrastructure isn't just about buildings. It encompasses all of the expensive equipment that comes with doing research, such as next generation sequencers, mass spectrometers, and the farm equipment to work in robotic agriculture, etc.
 - Bill added that, on top of the physical things necessary, one of the most important infrastructure pieces he sees is broadband capabilities. Research stations cannot do cutting edge research or big data science without access.
- In looking at big ideas, such as climate science, regenerative agriculture, etc., Joe urged caution, since the topics can be politically charged, particularly when it comes to Congressional delegations.
 - Bill noted, however, that basic investments in infrastructure are not mutually exclusive with any one discipline.
- Alton explained that ESCOP would be holding a January 11th webinar on the infrastructure efforts (with invitations going out early in December).
- Jody suggested forming a committee to put together a draft document that could be circulated to the rest of the committee. Rick Rhodes, Alton Thompson, Bill Barker, and Joe Colletti volunteered to take part in the effort. Susan Ducan volunteered offline.

7. **Next Scheduled Meeting(s) – Jellison**

- **Schedule reoccurring meetings – Jellison**

- **Does 4-5 pm Eastern the first Monday of every month work or should we go back to 4-5 pm Eastern the fourth Monday of every month?**
- Jody inquired as to whether the current meeting time should be retained through 2021. No one indicated that specific Mondays were a conflict. Jody suggested that anyone with major conflicts should reach out to Bret and/or Jody with the conflict.
- Jody suggested that the meetings continue to be held 4-5 p.m. Eastern Time the first Monday of the month.

Action Items:

- Send link from the upcoming Urban Agriculture Webinar (Wendy)
- Register for January 11th ESCOP Infrastructure Webinar (All)
- Compile draft Infrastructure Advocacy document for distribution throughout the group. (Bret, Rick, Alton, Bill, Joe, and Susan)

2021 Experiment Station Section Award for Excellence in Multistate Research (November 2020)

Purpose

The fundamental mandate of the Multistate Research authority compels State Agricultural Experiment Stations (SAES) to *interdependently* collaborate in projects that two or more states share as a priority, but for which no one state station could address singularly. Demonstration of interdependence is a high standard and has become a hallmark of the Multistate Research Program's management objectives.

The purpose of the Experiment Station Section Excellence in Multistate Research Award program is to annually recognize those station scientists who are conducting exemplary multistate activities and enhance the visibility of the multistate program. A recipient Multistate Project will be selected from the pool of nominees submitted by the five regional research associations (NCRA, NERA, SAAESD, WAAESD, and ARD), and judged by the ESCOP Science and Technology Committee (STC) to exhibit sustained, meritorious and exceptional multistate research activities. The ESCOP Executive Committee will provide final approval.

Award

The Experiment Station Directors have approved a monetary recognition of \$15,000 from the Hatch Multistate Research Fund (MRF) for the Excellence in Multistate Research Award winner. Up to \$5,000 has been available to cover travel for up to two members of the recipient project (the Administrative Advisor and Chair or their designees) to attend the awards ceremony at the APLU Annual Meeting. The remaining \$10,000, and any unused travel funds, has been available to support activities which enhance and contribute to the research and/or outreach objectives of that multistate project, consistent with the appropriate use of Hatch MRF. Use of these funds is a project committee decision made in conjunction with its Administrative Advisor.

Eligibility

Any current regional Multistate Project (research, ERA, CC) listed in NIMSS (www.nimss.org) is eligible for consideration for an Excellence in Multistate Research Award. **The nomination is predominantly based upon the five-year project period.**

The Multistate Research authority allows other non-SAES partners to join in these project-based collaborations. Thus, many multistate projects include extension specialists as members, as well as Agricultural Research Service or Forest Service research scientists. In addition, many projects have private sector and non-Land-grant participants. Moreover, the majority of multistate projects have participants from more than a single region, with many having representation from all regions such that they are national in scope.

Basis for Nomination

Each of the five regional research associations may nominate one Multistate Project chosen from the entire national portfolio of active projects. An individual project can document collaborative activities with one or more different multistate projects, if applicable, within the appropriate nomination criteria. Nominations shall be made to the Chair of the respective regional Multistate Research Committee (MRC) or Multistate Activities Committee (MAC) via the regional Executive Director's office. The documentation for this type of nomination should be sufficient to allow the review committee members to evaluate the Project according to the criteria listed below.

Criteria and Evaluation

Successful selections from regional nominations and advanced to the national competition for the ESS Excellence in Multistate Research Award will demonstrate high standards of scientific quality, research relevance to a regional priority, multistate collaboration on the problem's solution, and professional leadership in the conduct of the project.

All nominated projects, in the required 4-page format, shall be evaluated using the same criteria (with weights shown) based on the Project's:

- Issue, problem or situation addressed (5%)
- Objectives (5%)
- Accomplishments predominantly based upon the past five-year project period as
 - **Outputs** (the project's products and deliverables, 10%)
 - And qualitative and quantitative descriptions of social, economic, ecological, and(or) environmental benefits as:
 - **Short-term outcomes** (how has the project created awareness, 5%);
 - **Medium-term outcomes** (how has the project changed behavior, 5%);
 - **Long-term outcomes** (how has the project changed condition, 5%);
 - **Impacts** (what are the direct, indirect, and/or anticipated global benefits; how is society and the world better off, 15%)
- Added-value and synergistic activities across mission areas (30%)
 - Multi-disciplinary activities
 - Multi-functional integrated activities
 - Additional partnerships, associations or collaborations
 - Emphasize what the committee did together that would not have been accomplished with individual work
- Evidence of multi-institutional and leveraged funding with examples of sources (15%)
- Summary of participating institutions and units (5%)

Selection Process

The ESCOP STC will serve as the review panel. The review panel will select from the annual group of regional nominees a national winner in time for public announcement and award presentation at the APLU Annual Meeting each year. All nominated projects will be evaluated using the same criteria.

Award and Presentation

The national winning project will be recognized by the Experiment Station Committee on Organization and Policy (ESCOP) Chair and USDA NIFA Administrator during the Awards Program held at the APLU Annual Meeting. Each regional award winning project will be included in the APLU Awards Program by project number and title, technical committee chair, administrative advisor and participating institutions. This National Awardee narrative will be created by the Impact Writer and submitted to STC Executive Vice-Chair. The title of the national winning project will be added to a plaque located at the USDA NIFA Headquarters.

Timeline

- November – Announcement sent to Directors and Administrators, Administrative Advisors and NIMSS participants by ESCOP Chair
- February 28 – Nominations due at Offices of the Executive Directors
- March – Nominations reviewed by regional Multistate Research or Multistate Activities Committees and recommendations submitted to regional associations
- March/April – Regional associations approve regional nominations at Spring meetings
- April/May - Regional associations review, edit and finalize their nomination prior to the final submission
- May 15 – Associations submit final regional nominations to ESCOP STC Committee via the regional association supporting STC (**pdf and word document**)
- June – ESCOP STC Committee reviews regional nominations in early June and submits recommendation for national winner to ESCOP Executive Committee
- June/July – ESCOP Executive Committee selects national winner
- July – National winner submitted to APLU and ESCOP Chair announces at Joint COPs
- July– STC Executive Vice-chair collects information from regional associations, secures project pictures, and submits materials to APLU for booklet and program script; NIFA notified for USDA NIFA Headquarters plaque inscription
- September – National winner announced at ESS meeting
- November – National award presentation at APLU Meeting

Nomination Format

(The nomination should be a very concise summary and must be in this format.)

Nominating Region: _____

Nominator: _____ **E-mail:** _____

Project or Committee Number and Title: _____

Technical Committee Chair: _____ **E-mail:** _____

Administrative Advisor: _____ **E-mail:** _____

Project Summary (noting the following):

- Issue, problem or situation addressed (5%)
- Objectives (5%)
- Accomplishments predominantly based upon the past five-year project period as
 - **Outputs** (the project's products and deliverables, 10%)
 - And qualitative and quantitative descriptions of social, economic, ecological, and(or) environmental benefits as:
 - **Short-term outcomes** (how has the project created awareness, 5%);
 - **Medium-term outcomes** (how has the project changed behavior, 5%);
 - **Long-term outcomes** (how has the project changed condition, 5%);
 - **Impacts** (what are the direct, indirect, and/or anticipated global benefits; how is society and the world better off, 15%)
- Added-value and synergistic activities across mission areas (30%)
 - Multi-disciplinary activities
 - Multi-functional integrated activities
 - Additional partnerships, associations or collaborations
 - Emphasize what the committee did together that would not have been accomplished with individual work
- Evidence of multi-institutional and leveraged funding with examples of sources (15%)
- Participating institutions and units (5%) (**page 4 only**)

Nominations will be **no more than 3 single spaced pages** (Times Roman 12 point and one inch margins) plus a 1-page summary of Participating institutions and units (alphabetized) for a **total of 4 pages**. Regions may utilize other information in selecting their nominee. The final regional nomination should be submitted by email to the Offices of the regional Executive Directors, by **c.o.b. February 28, 2021**:

Chris Hamilton, North Central <christina.hamilton@wisc.edu>

David Leibovitz, Northeast <david_leibovitz@uri.edu>

Gary Thompson, South <gat009@uark.edu>

Bret Hess, West <bhess@unr.edu>

Dr. Alton Thompson, ARD <athompson1@ncat.edu>



A National Study of Capital Infrastructure at Schools of Agriculture: A 2020 Update

Produced by Gordian *(formerly Sightlines LLC)*

September 2020

Authored by:

Peter Reeves, Vice President

Sophie Mason, Senior Account Manager

Luke Sanders, Data Analyst

Foreword: An update to the 2015 Study

In the five years since the first nationwide study of infrastructure and deferred maintenance at schools of agriculture across the nation was completed, the topic of managing deferred maintenance has become an everyday conversation for many campus administrators. We continue to hear faculty stories of situations where deterioration of facilities interrupts the pursuit of the research or education mission. During the 2015 study, Gordian (formerly Sightlines LLC) identified approximately \$8.4 billion in infrastructure and deferred maintenance needs across more than 90 institutions¹. This need was concluded to be the result of an aging portfolio of facilities, many of which were constructed at a time of lower quality construction standards, coupled with an under-investment of resources into renewal and repair of existing facilities. The study identified several strategies that, if implemented, would start the slow progress of turning around the deferred maintenance problem. These strategies ranged from increasing funding from federal and state governments to encouraging individual campuses to consider how they are prioritizing investments. Despite many efforts to implement some of these strategies, one thing is clear: the deferred maintenance problem increased in severity over the last five years.

2020 has presented new challenges with the COVID 19 pandemic and the subsequent economic distress that have fallen on college and university campuses. The significant reductions in resources for maintenance and repair required to cope with budget shortfalls on many campuses make it is likely that the deferred maintenance problem gets much worse before it gets better. The effort to update the study for 2020 was driven in part by the desire to understand how the deferred maintenance issue has changed over the last 5 years. It is particularly crucial to continuing to highlight the importance of investments into capital infrastructure as a requirement to positioning our world-class schools of agriculture to confront the challenges we face as a society today.

Douglas I. Steele, PhD

Vice President Food, Agriculture and Natural Resource

¹ Responding institutions include 3 types of land-grant university and colleges (1862, 1890, and 1994) and other non-land-grant universities.

Section 1: Introduction

Why study deferred maintenance at schools of agriculture?

It is hard to understate the importance of agriculture and agriculture related activities to the prosperity and well-being of the United States. In 2017, agriculture and related industries contributed over \$1 trillion to U.S. GDP or 5.4% of total GDP². Our agriculture industry is responsible for 22 million jobs or 11% of U.S. employment³. Also true is that food accounts for 13% of the average American households' expenditure in 2018, which is only behind housing and transportation⁴. With the challenges society faces today, including climate change and economic disruption, access to affordable and safe food has been and continues to be a key priority for our country. Our agriculture industry has managed to rise to this challenge and increased productivity consistently over the years⁵.

The continued success in increasing productivity of our agriculture industries can be attributed in large part to the advancements made in the research, education, and extension activities occurring at schools of agriculture throughout the United States. The National Institute of Food and Agriculture (NIFA), created by the 2008 Farm Bill and authorized to continue activities through 2023 by the 2018 Farm Bill, provides funding and grant programs for these activities in the amount of \$1.5 billion annually⁶.

This commitment is acknowledgement of the grand challenges that schools of agriculture are focused on addressing. These include food security and safety, climate variability and change, water availability and quality, the creation of a thriving bioeconomy (bioenergy and bio-based products), and combatting childhood obesity. Addressing these challenges will require breakthrough research in many areas, including plant and animal genetics, invasive pest and disease control, natural resource management, and food nutrition. While research will provide answers to the complex issues today, schools of agriculture must also train the next generation of scientists, producers and educators to tackle the

² <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/>

³ <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/>

⁴ <https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/>

⁵ <https://www.ers.usda.gov/data-products/agricultural-productivity-in-the-us/agricultural-productivity-in-the-us/#National%20Tables>

⁶ <https://nifa.usda.gov/sites/default/files/resource/NIFA-2018-Annual-Report.pdf>

challenges of the future. And finally, all the knowledge gained through research and education activities must be put in the hands of the people who need it most, through effective extension programs. With such important work to be done and substantial taxpayer money supporting it, the issue of deferred maintenance at schools of agriculture exists as an impediment to successfully meeting these mission mandates.

As researchers and educators try to perform 21st century science in facilities constructed in the 1950s and 1960s, facilities that have not received substantial capital infrastructure investments, they will likely encounter more roofs that leak, HVAC systems that fail, laboratories that deteriorate, animal care that is compromised, and an impacted user experience for building occupants.

The rising demand for capital infrastructure investment

Gordian’s work with Higher Education institutions across the U.S. and Canada has identified several factors which, when combined, are projecting a substantial risk to growing backlog of deferred maintenance and infrastructure investments from the already elevated levels seen today. The following key drivers of deferred maintenance explain both the current backlog of deferred maintenance and capital infrastructure, and the risk that this will substantially increase in the future.

Age distribution of campus facilities. Our research has identified that there are specific points in time when a building’s core mechanical, exterior, and interior systems reach the end of their useful life and must be replaced. Sometimes this means that relatively few systems come due at one time. However, as a building becomes older and multiple systems begin to reach the ends of their useful lives, all require replacement at the same time. This generally begins as a building reaches 25 years of age and accelerates once that building’s age exceeds 50 years. As a greater share of space falls in the 25 to 50-year and over 50-year categories, campuses are unlikely to have the funding to address all of the systems coming

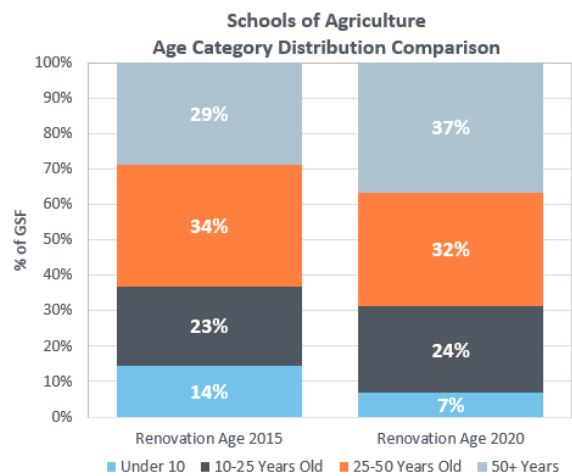


Figure 1

due, and as a result postpone investments and defer those projects to a later date. Schools of agriculture have 69% of space over 25 years old, an increase of 6% from 2015 (Figure 1).

Underfunding of capital infrastructure investments and major renovations. When thinking about investing in campus facilities, Gordian makes a distinction between “keep-up” investments and “catch-up”. “Keep-up” investments are the projects that ensure that buildings will continue to perform properly, and that systems will reach the end of their useful life. “Catch-up” investments are the major infusions of capital, typically occurring into facilities that have not received sufficient “keep-up” funding over their life, that result in a major rehabilitation or renovation to that facility. We consistently see levels of “keep-up” funding that are inadequate and declining across Higher Education, leading to an increased number of projects being deferred. In addition, other funding is frequently focused on new construction projects, rather than the major renovations or “catch-up” needs, leaving older facilities to fall into ever greater disrepair.

Competition for funding between legacy buildings and modern buildings. Higher Education has two distinct waves of building construction that have occurred over the last 150 years. The first wave, buildings built between 1950 and 1980, represent many of the legacy buildings that exist on campuses today. These facilities were constructed at a time when campuses were expanding dramatically and have played a crucial

role over the last 50 years in support of key programs at each institution. However, it is true that many of these facilities are reaching the end of their useful lives and will require substantial investments to meet the current needs of their programs. The HVAC wave, buildings built since 2000, represent high quality, but also highly complex, modern buildings. Many of these facilities were added to campuses to meet the increasing facilities demands of 21st century research. As a result, these facilities have many more components that are highly complex and expensive to replace. Within the next 5 years, these modern buildings will also cross the 25-year age mark, driving costs up as a large portion of the complex

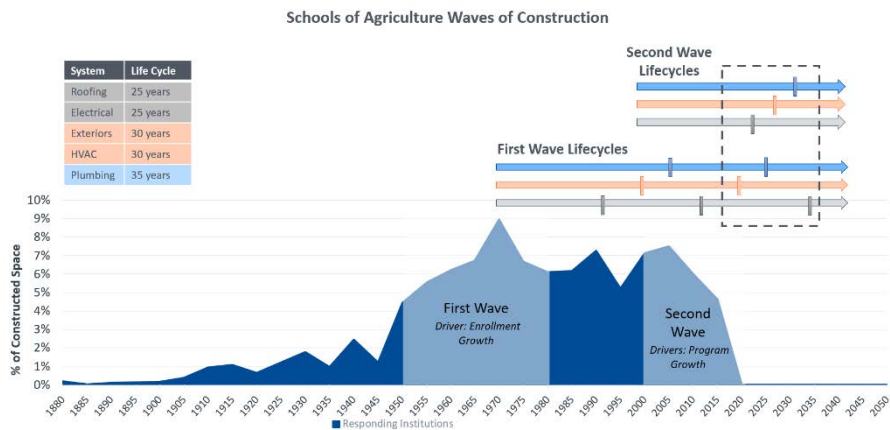


Figure 2

role over the last 50 years in support of key programs at each institution. However, it is true that many of these facilities are reaching the end of their useful lives and will require substantial investments to meet the current needs of their programs. The HVAC wave, buildings built since 2000, represent high quality, but also highly complex, modern buildings. Many of these facilities were added to campuses to meet the increasing facilities demands of 21st century research. As a result, these facilities have many more components that are highly complex and expensive to replace. Within the next 5 years, these modern buildings will also cross the 25-year age mark, driving costs up as a large portion of the complex

components come due. With both groups of buildings requiring capital investment at the same time, it is unlikely that either group will receive sufficient funding to stem the increase in deferred projects. Schools of agriculture have 40% and 18% in legacy and modern buildings respectively (Figure 2).

As the updated data for this study shows, these drivers are firmly in place across schools of agriculture in the U.S. and present the likelihood that the deferred maintenance problem risks becoming more acute over the next 10 years. Understanding the current size of the deferred maintenance problem, how it has changed, and the root causes is critical to raise awareness of the urgency of the problem and develop effective strategies to stem the growth.

Section 2: Methodology

This study includes only buildings and supporting facilities at schools of agriculture that are authorized to receive USDA funding if it were to be appropriated. Through the course of our two studies, we have collected standardized data on over 16,000 buildings and 95 million gross square feet across 97 institutions. We have compiled this information into a large database. The information collected for each facility includes size, function, technical complexity, construction year, and renovation year. Utilizing this information, we are able to estimate the level of deferred maintenance and capital infrastructure investment need. This is based off our database of deferred maintenance studies that Gordian (formerly Sightlines) has completed at more than 150 campuses. Compiling this information into a single database has allowed us to amass one of the largest databases of building level details for U.S. schools of agriculture research, classroom/teaching, and extension facilities.

Section 3: Summary of Findings

Our update to the total deferred maintenance figure for 2020 was determined to be almost \$11.5 billion, compared to a total replacement value of the facilities surveyed of \$38.1 billion. This figure represents a growth of approximately 37% from the study in 2015 (Figure 3). The growth over this 5-year period can be attributed to both the increasing cost of capital infrastructure investments (inflation) and additional projects being deferred due to the drivers discussed above. Ultimately, looking at this figure on a per gross square foot (GSF) basis allows you to compare it to industry benchmarks. At \$120 per GSF, schools of agriculture have exceeded both our higher education and industry national averages (Figure 4). Additionally, we have determined that as deferred maintenance exceeds \$100 per GSF, building system failures become more likely, day to day operating costs increase, and occupant experience begins to be impacted.

In considering the risk posed by high levels of deferred maintenance to the research, education and extension activities, we can differentiate between different types of spaces across schools of agriculture. The distribution of space surveyed includes 31% research space, 26% classroom/teaching space, and 4% extension space. The remaining 39% is distributed between farm, support and greenhouses. Of even greater importance is the amount of deferred maintenance occurring in those mission critical facilities. We observe that over \$7.5 billion of the total identified deferred maintenance needs fall in the research, classroom/teaching, and extension space. This amounts to over 66% of deferred maintenance needs identified. This highlights that while there are a substantial number of farms, greenhouse and support facilities (39%), those facilities tend to be less complex and have a smaller share of the total deferred maintenance identified. Considering this on a per GSF basis, we see research at \$142 per GSF, classroom/teaching at \$120 per GSF, and

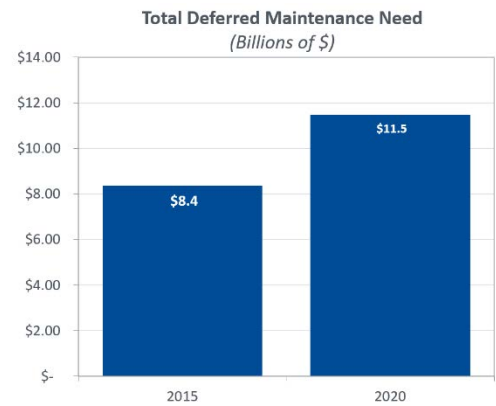


Figure 3

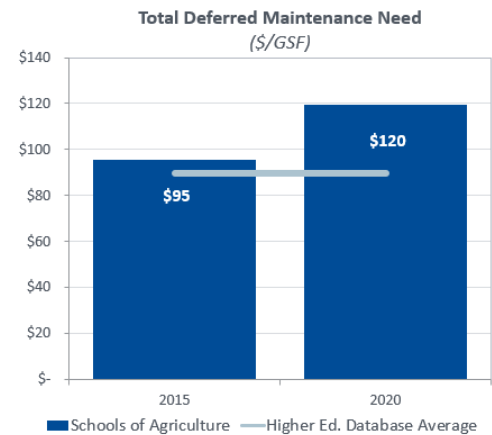


Figure 4

extension at \$105 per GSF, well above the school of agriculture average and the national average (Figure 6). This further confirms the risk of research, classroom/teaching, and extension interruption or impacts posed by deferred maintenance.

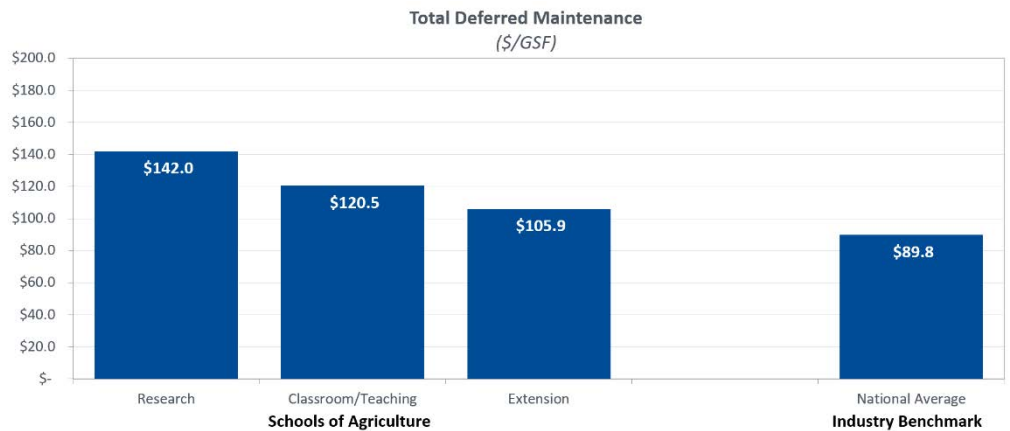


Figure 6

Section 4: Strategies for Change

As we have shown in this updated study, the deferred maintenance problem at schools of agriculture has grown in magnitude and urgency since the original study done in 2015. Despite efforts made by some to implement strategies to stem the growth of deferred maintenance, the continued aging of facilities, the lack of funding to address capital infrastructure, and the increasingly competing demands between different eras of construction have led to a 37% increase in deferred maintenance need in 5 years. Our analysis suggests the severity of the deferred maintenance problem at schools of agriculture will become more acute in the decades to follow, absent significant action from multiple entities and stakeholders.

To turn the tide on this deferred maintenance problem, the efforts pursued will have to address both the need to “catch-up” on the deferred maintenance that exists today, while simultaneously establishing an approach to “keep-up” with future capital infrastructure renewal. This balancing act can be exceptionally difficult due to the need to coordinate funding and efforts between many different institutions, administrators, agencies, and government bodies. We claimed in the 2015 report *“In past studies, Sightlines has been reluctant to say an infusion of money is the answer to the growing deferred maintenance problem in higher education. But without a major infusion of funding over time, the*

classroom, scientific research, animal care, extension and support buildings on APLU BAA campuses will face a future of:

- *Roofs that leak, foundations that crack and doors and windows that do not keep the heat in or the cold out.*
- *HVAC, electrical and plumbing systems that fail.*
- *Laboratories that cannot function.*
- *Animal care that is compromised.*
- *Health and safety problems for building occupants.”*

This is as true today as it has ever been, with deferred maintenance needs having grown 37% to \$11.5 billion since that first report was written.

A “Catch-up” is needed. It remains that an immediate, targeted, and substantial infusion of funding for the renewal and reinvestment of existing school of agriculture facilities is needed in order to protect the billions in research, classroom/teaching, and extension activities currently being conducted in these facilities across the country.

- The magnitude and urgency of the funding needed, along with the substantial stake held by the federal government in the work being conducted at these facilities, make the federal government a key piece in any effort that is to be successful in addressing the current problem.
- States also have a role to play in supporting the schools of agriculture in their states, as they are prime beneficiaries of the increased productivity and profitability of agriculture and agriculture related businesses in their states. A matching program between states and the federal government could present a promising approach to growing the amount of funding addressing this problem, as could making large infusions of federal government funding contingent on some ongoing state funding to support these facilities long into the future.

Campuses have a role to play in "Keep-up". While an immediate infusion of funding would have dramatic effects and create significant benefits to the institutions and communities receiving them, failure to solve the conditions that have allowed for this problem to exist will result in history repeating itself.

- Campuses need to develop long term capital infrastructure plans. These plans should provide a framework for understanding how the campus is going to set funding priorities, target major renovations over time, and determine conditions for demolition and/or divestment of existing buildings.
- Campuses need to steward new or newly renovated facilities through practicing proactive maintenance programs and establishing recurring funding sources for maintenance and repair. Our research suggests that \$1 dollar spent on these types proactive practices can equate to \$3-4 dollars in the future, when delayed and resulting in a failure or reactive expense.
- Our analysis suggest that schools of agriculture will require a sustaining annual investment of approximately \$550 million each year just to keep the \$11.5 Billion in deferred maintenance from growing larger. A successful long term strategy will not only start to address the \$11.5 billion, but will also begin to identify sources of funding that can grow over time to the \$550 million needed on an annual basis.

Capital Infrastructure

investment benefits the local communities. With \$11 billion in potential capital infrastructure construction projects, were funding allocated to address these needs, the economic impact would extend far beyond just improving the facilities and experiences of those at the schools of agriculture. As Josh Bivens, Director of Research at the Economic Policy Institute,

discusses in his report on employment multipliers for the U.S. economy, “Each industry has backward linkages to economic sectors that provide the materials needed for the industry’s output, and each industry has forward linkages to the economic sectors where the industry’s workers spend their income.

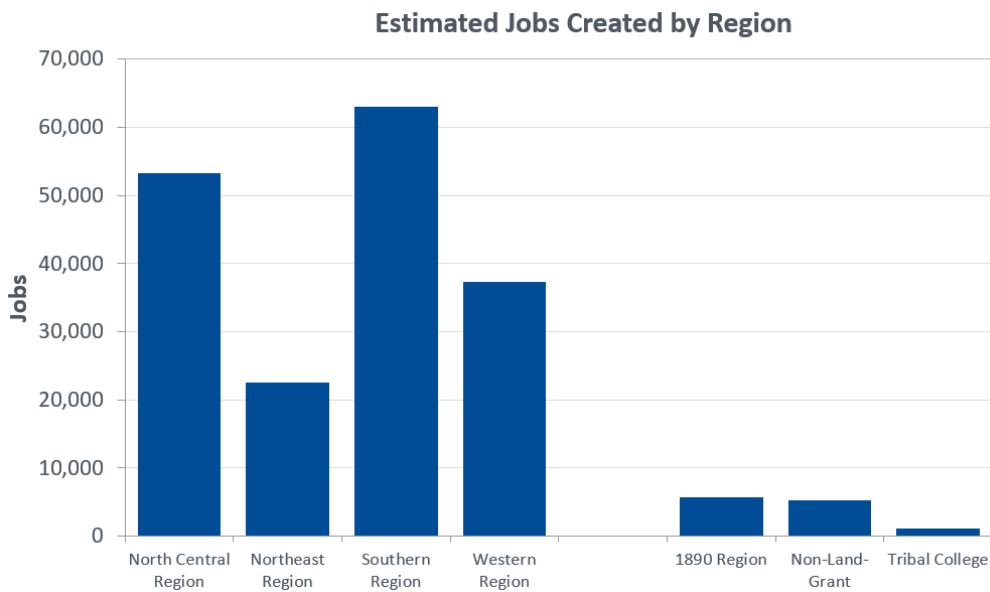


Figure 7

Therefore, in addition to the jobs directly supported by an industry, a large number of indirect jobs may also be supported by that industry. The subtraction (or addition) of jobs and output in industries with strong backward and forward linkages to other economic sectors can cause large ripple effects."⁷ Using Bivens' research, we can estimate the impact on the local job creation (both direct and indirect) that would result from funding capital infrastructure investments. It is estimated that nearly 200,000 new jobs could be created by funding the work identified in this study (Figure 7).

Due to the presence of schools of agriculture throughout the country, the distribution of their facilities across states, and the presence in both rural and urban communities, the economic impact and job creation caused by these types of investments would be broadly felt. This means that investments in capital infrastructure at schools of agriculture will not just sustain the research, education and extension activities, but can be a driver of economic growth in many communities that rely heavily on the local university, research stations, and/or extension centers as an engine for economic development.

⁷ <https://www.epi.org/publication/updated-employment-multipliers-for-the-u-s-economy/>

Conclusion

The deferred maintenance problem that exists at schools of agriculture today was not created overnight or by decisions made by any one entity. It is the result of a number of driving factors, including aging buildings, scarce funding, and increasing building complexity. It is also clear that the downstream effects of the COVID pandemic will put further pressure on institutions abilities to manage deferred maintenance. While this problem was not created overnight, its implications are increasingly approaching an inflection point where the detrimental impacts of deferred maintenance become a common occurrence. Over the last decade there have been several high-profile building system failures that have resulted in lost research. One notable example was a freezer malfunction (along with the 2 alarm systems that should have been triggered), which severely damaged a third of the world's largest donated brain collection for autism research⁸. It has been estimated that this loss could set autism research back by a decade or more. Given the magnitude of the societal challenges that schools of agriculture are working on, any interruption or loss of research cannot be tolerated. The window of opportunity is closing for schools of agriculture to proactively address deferred maintenance and mitigate the risk of research, education or extension interruption.

To begin reducing the deferred maintenance burden will require a coalition of efforts, pursuing multiple solutions concurrently. Inaction will not do, as it has led to the problem we face today, a problem that is projected to accelerate in its severity over the next 10 years. All levels of government, campus administrators, and any agency with a vested interest in the work being done at U.S. schools of agriculture have a role to play. By acknowledging the problem and pursuing the strategies outlined in this report, the success of our agriculture research, education, and extension activities can be preserved for generations to come.

⁸ <https://hms.harvard.edu/news/freezer-failure-brain-bank-hampers-autism-research>

Critical Infrastructure Support for Colleges of Agriculture at Land-grant Universities

April 2020

This formal request elevates the national problem of critical infrastructure needs for research, Extension and teaching facilities at 1862, 1890, and 1994 Land-grant and non-Land-grant schools of agriculture (herein referred to collectively as Land-grant) to a **priority for Federal resources** through funding an infrastructure grant program administered by USDA/NIFA. These Land-grant schools of agriculture have assured a plentiful, safe, affordable food supply in America for decades, which has continued through the current COVID 19 pandemic.

In February 2015, the APLU/BAA Policy Board of Directors, with Land-grant system-wide financial support, contracted with Sightlines, a nationally recognized independent consulting firm that specializes in analyzing and benchmarking all aspects of deferred maintenance, capital investment, and facilities operations at universities across the United States, to document infrastructure needs on Land-grant university campuses. The results of that comprehensive study <http://escop.info/wp-content/uploads/2017/04/A-National-Study-of-Capital-Infrastructure-Deferred-Maintenance-at-Sch-.pdf> were released on October 15, 2015 and documented a staggering collective total of \$8.4 billion in deferred maintenance for buildings and supporting facilities at schools of agriculture authorized to receive U.S. Department of Agriculture (USDA) funding. This ongoing need has resulted in higher maintenance costs, asset failure, and in some cases, health and safety implications. Addressing this situation is not simply a matter of spending the accumulated amount identified. Instead, it requires renovating and replacing under-maintained facilities and increasing maintenance expenditures going forward. The Sightlines Study assessed more than 15,000 buildings that had a combined replacement value in 2015 of \$29 billion.

Sightlines methodology included a survey of 101 colleges and universities, accompanied by a comprehensive building-by-building inventory of agriculture and agriculture-related space, and detailed reports on infrastructure needs in those buildings. The survey received a 90 percent participation rate (91 responding institutions).

Following publication of the Sightlines report on deferred maintenance at Land-grant campuses, the APLU/BAA Policy Board of Directors appointed a Task Force to review the report and recommend strategies to address these critical infrastructure issues. The committee released their report to the BAA family in November 2016. Among the many conclusions found in the report, the Task Force suggested to “Create a new and separate grants program within USDA/NIFA to assist in funding major renovations and/or new construction to replace facilities created prior to 1990. This program should be designed to make a sufficient investment to help reduce the backlog of infrastructure needs by replacement with new or renovated facilities.” The Task Force further determined from the Sightlines report that “it is estimated that some \$300 million (annually) is needed just to maintain the status quo.” Five years have passed since Sightlines conducted the study, and with no influx of new funds into infrastructure budgets,

resulting in a conservative estimate bringing the current total in deferred maintenance to over \$10 billion.

We propose that funding for an agriculture-focused infrastructure competitive grant program such as the Research Facilities Act, as authorized in Section 7503 of the 2018 Farm Bill, be included in the _____ bill. The funding should be \$8.4 billion (including 4% Federal Administration) added to the USDA/NIFA budget designated for infrastructure grants awarded over a five-year period. In addition, we would request that the Secretary have broad waiver authority to implement the Research Facilities Act. Given the uncertainty ahead, broad waiver authority will allow the Secretary to implement the program as appropriate. This request is in addition to the Facilities Improvements at 1890 Institutions program already authorized and funded. The Research Facilities Act would assure a total investment of \$12 billion (assuming a 50% non-Federal match required in Section 7503) into capital infrastructure at Land-grant/capacity institutions across the country and many other locations within each state. Short-term, this program would generate a significant impact on local economies of Land-grant/capacity institution communities and rural areas surrounding outlying research and Extension centers and contribute significantly to their post-pandemic recovery. Long-term, this influx of new funds would help assure continued significant returns on Federal investment resulting from food, agriculture, and natural resources research, Extension and teaching into the next century by addressing the current critical infrastructure crisis.