



RESILIENT LANDSCAPE STRATEGY

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 **ILLINOIS**
Facilities & Services



RESILIENT LANDSCAPE STRATEGY

2019 Resilient Landscape Strategy

A Strategy for Improving the Landscape at the Urbana campus

November 1, 2019

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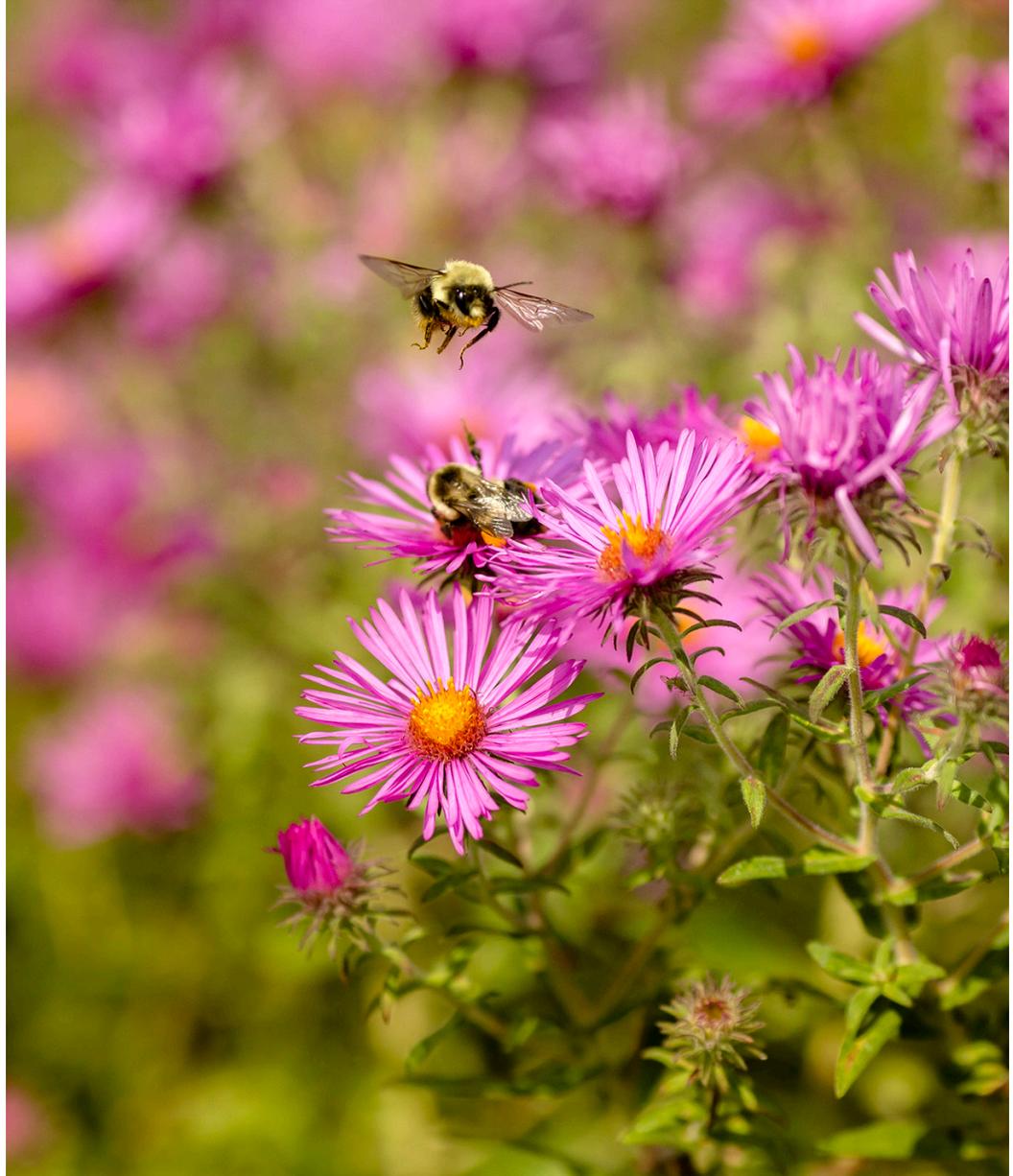


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EXECUTIVE SUMMARY

Executive Summary

At the University of Illinois at Urbana-Champaign, campus landscapes are our habitats, the places where we work, relax, and engage with others. Campus landscapes sustain us. They clean our air, beautify our surroundings, sequester carbon, and provide us with motivation and inspiration. Campus landscapes are as essential to our health and well-being as any brick and mortar infrastructure, and yet we often act as if the spaces between the buildings don't matter. With proper design, direction and support, our campus landscapes can become multi-functional spaces that support teaching and research activities and promote the well-being of our campus community. With proper design, direction and support, our landscapes can contribute to our economic success by drawing new students and donors to our doors.

We have an obligation to steward and maintain our landscapes in sustainable ways, to reflect upon the past to envision a healthier, more resilient future. Our campus landscapes must be future-focused, able to withstand and recover quickly from the challenges of tomorrow: climate change, large storm events, and the heavy use by tens of thousands of individuals. The Resilient Grounds Advisory Committee was tasked by Facilities & Services (F&S Executive Director Mohamed Attalla to develop a Resilient Landscape Strategy to help campus landscapes—and the people who care for them—become more resilient to environmental, societal, and economic challenges.

The committee identified five key challenges that campus landscapes face and developed a set of solutions to meet these challenges, summarized below. Implementing these solutions will ensure that our campus landscapes are designed and maintained in a fashion that is commensurate with our international world-class status.

Key Issues and Solutions

1. **Lack of a landscape master plan.** While the 2017 Campus Master Plan provides an overall vision for a sustainable campus, the plan prioritizes buildings over landscapes. There is no cohesive, shared vision for resilient campus landscapes and limited guidelines for ensuring landscapes' long-term success.

Solutions

- Develop a Landscape Master Plan that includes a shared vision for the overall campus landscape and specific design guidelines. This should include establishing a steering committee, hiring an external landscape architecture firm, and extensive public and stakeholder engagement.
2. **Unclear decision-making structure.** Too many people feel they have authority over landscape decisions, leading to disjointed designs and unsustainable development. The





University Landscape Architect's authority over campus landscapes is compromised by an unclear authority and reporting structure and an uninformed appeals process.

Solutions

- Establish a Campus Landscapes department at F&S. This will include clarifying the role of the University Landscape Architect (ULA) and providing appropriate resources.
 - Create a landscape design appeals process. Landscape and site projects that the ULA determines do not align with the Landscape Master Plan will follow this process for approval. The landscape design appeals committee should have representation from faculty, students, and administrative staff, including a Native American representative.
 - Revise landscape policies, including development of a maintenance responsibility map for outdoor spaces in the University District, a landscapes calendar to allow our landscapes to recover from major events, and enhanced academic collaborations.
3. **Lack of resilient rainwater management.** Conditions and standards for managing rainwater on campus are out of date, leading to flooding and pollutants in the waterways. Rainwater is whisked away instead of being protected and utilized as a resource.

Solutions

- Increase education and engagement, for grounds employees and Illinois communities. Also, initiate a recurring student design competition, and fund the implementation of their designs.
 - Require Best Management Practices (BMPs) for rainwater management, in both core campus areas and agriculture lands.
 - Develop and follow a comprehensive rainwater management plan.
4. **Inadequately-resourced F&S Grounds department.** Landscapes and open spaces have been marginalized and simplified, and campus has experienced an overall loss of aesthetic value. Staff levels, equipment and facilities are insufficient to maintain campus landscapes at a level that makes it possible to maintain a resilient campus landscape.

Solutions

- Increase the F&S Grounds staffing complement, including additional Grounds Workers; reinstating the Grounds Gardener, Horticulturist, and Tree Assistant positions; and hiring an Ecologist.
- Train the grounds employees, both at F&S and for all units with grounds staff.

- Provide appropriate equipment and facilities, with updated equipment and planning for appropriate substation facilities.

5. **Inconsistent funding for landscape improvements.** Campus landscape improvements are most often funded as part of capital building projects, but the site improvements are often the first to be cut when budgets are tight. We need a way to protect capital project funding for landscape improvements and to ensure that there is adequate funding for landscape improvements beyond capital projects. Currently, there is very little direct funding and donor support for landscape improvements.

Solutions

- Earmark capital project funding for landscapes.
- Provide direct annual funding for landscape improvements.
- Prioritize efforts to seek donor funding for campus landscapes.
- Establish a Rainwater Management utility fee.

Additional information, background, observations, and recommendation details are provided in the following report. Implementing these changes will promote a cultural shift within our campus, amplifying other efforts to promote campus landscape health, beauty, and sustainability for the next 150 years.





INTRODUCTION

Introduction

The benefits of a multifunctional and well-managed campus landscape are wide-reaching and multi-faceted, from simple campus beautification to sustainable carbon sequestration, from living lab experiences to natural stress reduction and passive recreation. Campus grounds contribute to the economic sustainability of our university. Studies show that prospective students decide their future enrollment in the first ten minutes on site. Likewise, potential donors and employees, visiting alumni, and all other visitors from the public naturally make judgments about the excellence of our university based in part on the campus aesthetic.

In recent years, campus landscapes have begun to transform without a cohesive master plan and often without the proper infrastructure behind them to ensure long-term success. For several decades, campus funding has focused on major improvements at the building and site level through large-scale capital projects. These projects have improved the exterior campus surroundings in select areas, but often the site designs implemented require specialized skill sets and additional maintenance from the Facilities and Services (F&S) Grounds department that is not currently resourced. Additionally, these structural changes to campus came during a time of long-term budgetary cuts and staffing reductions, which have not yet been addressed.

Over time, university lands have been split between various responsible units for maintenance and associated operational costs. The lands are split between F&S Grounds, auxiliary units (Athletics, Housing, Parking, Campus Recreation, McKinley Health Center, and the Illini Union), and Chancellor's Office units (Willard Airport and Allerton Retreat and Conference Center). Although some auxiliaries and other units contract with F&S Grounds for maintenance; Athletics, Campus Recreation, and Allerton have their own maintenance crews. In addition, the Arboretum and some other lands for the College of Agricultural, Consumer and Environmental Sciences (ACES) are allowed exceptions for non-F&S maintenance responsibility, further contributing to a disconnect from the wider landscape vision and needs of the university.

Areas of campus that are not part of capital improvement projects do not have any significant funding allocations for landscape improvements. This sets up a system of social inequity where new projects from well-funded colleges tend to be the most aesthetically pleasing, with modern planting designs focusing on native plant communities and environmental benefits. This disparate treatment to the campus landscape fabric has led to a visually divisive look that detracts from the common University of Illinois experience that students, parents, visitors, and administration expect and deserve.

The need for a unified, resilient, and sustainable campus landscape is emphasized in the 2015 Illinois Climate Action Plan (iCAP), which specifically suggested:

A Sustainable Plantings Consultation Group could be formed to evaluate existing campus landscaping standards and to identify ways in which these standards should be changed to increase the use of native and sustainable plantings across campus. This group would include experts at F&S, the Prairie Research Institute, and other faculty and staff with relevant expertise. Expansion of native and sustainable plantings would provide benefits in terms of reduced maintenance and irrigation needs, as well as in increased biodiversity, an example being pollinators. It is also important to evaluate campus maintenance practices with respect to landscaped areas. Campus could develop and implement a tree care plan, as well as an Integrated Pest Management program.

Several of the above suggestions have already been implemented through F&S leadership and collaborations, including facility standards revisions, volunteer agreements to support native





plantings, designation as a Tree Campus (2015) and a Bee Campus (2018), and a formal Integrated Pest Management program at F&S Grounds. However, adoption of sustainable and resilient landscape practices is far from widespread across campus, and there are competing ideas of what constitutes a resilient and sustainable landscape.

We have an obligation to steward and maintain our valuable campus landscapes in sustainable and resilient ways. The challenges described above limit our ability to develop a resilient, beautiful, and multifunctional campus landscape, and solutions are needed to address these challenges.

Advisory Committee

To address these challenges, a committee was formed and tasked to develop this report. F&S Executive Director Attalla formed a Resilient Grounds Strategy Advisory Committee in spring 2019. The committee included representatives from the Department of Landscape Architecture, the Prairie Research Institute, the Office of the Provost, and F&S experts, as well as a student representative from the academic senate and an expert from a peer institution. Four of the committee members are also part of the iCAP Working Group or a Sustainability Working Advisory Team (SWATeam), managed by the Institute for Sustainability, Energy, and Environment. The Head of the Department of Landscape Architecture, Professor William Sullivan, served as chair for the committee, which met on January 25, February 13, March 12, May 10, June 10, June 14, June 20, July 3, and July 25.

Some key considerations addressed by the committee include:

- How might we make the campus landscape and grounds more sustainable and resilient to the impacts of climate change?
- How can we create uniform and consistent messaging across the many different kinds of landscapes across campus?
- What sense of place do we want to create, and what administrative, academic and societal goals should we consider?
- How can campus landscapes reflect our connection to native lands and peoples?
- How might landscapes create environmentally supportive instructional and research opportunities that reflect the mission and vision of the university?
- How can we manage landscapes and grounds in a fiscally accountable way, balancing the need for economic sustainability with environmental sustainability?

The committee toured and studied the campus, utilized internal and external experts and stakeholders, and developed a set of recommendations intended to address the committee charge and the various constituencies that provide support for or utilize the resources of the campus landscape. Implementing these recommendations will ensure that our campus is designed and maintained in a fashion that is commensurate with our international world-class status.

Land Acknowledgement Statement

The University of Illinois Land Acknowledgement Statement recognizes Native peoples as the traditional guardians of the lands on which the University of Illinois at Urbana-Champaign is situated: “As a land-grant institution, the University of Illinois at Urbana-Champaign has a responsibility to acknowledge the historical context in which it exists. . . . We are currently on the lands of the Peoria, Kaskaskia, Peankashaw, Wea, Miami, Mascoutin, Odawa, Sauk, Mesquaki, Kickapoo, Potawatomi, Ojibwe, and Chickasaw Nations. It is necessary for us to acknowledge these Native Nations and for us to work with them as we move forward as an institution. Over the next 150 years, we will be a vibrant community inclusive of all our differences, with Native peoples at the core of our efforts.” This is a poignant reminder of the responsibility our university has for working with Native Americans as we move forward with protecting the natural environment, especially within the Urbana landscape under our Chancellor’s direct authority.





KEY CHALLENGES

Key Challenges

The committee undertook a comprehensive review of the existing conditions for campus landscapes, including the overarching vision established in the 2017 Campus Master Plan and the 2015 Illinois Climate Action Plan (iCAP), as well as operational processes and challenges for both basic maintenance of the grounds and sustainable landscape improvements. Through this review process, the following five key challenges were identified, which we introduce here and discuss in more detail in subsequent sections.

1. Lack of a Landscape Master Plan

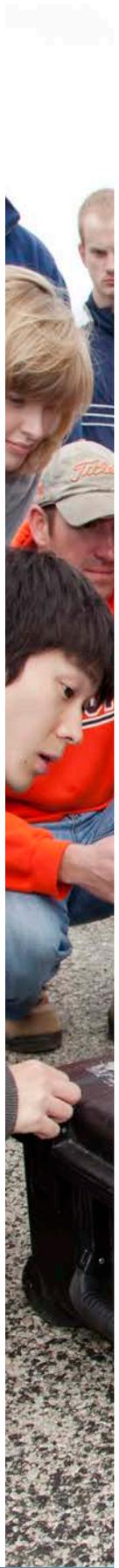
The 2017 Campus Master Plan provides an excellent framework for future campus development, but it focuses primarily on buildings, infrastructure, and systems. While the Master Plan includes a broad vision for a sustainable campus, this vision lacks specificity regarding campus landscapes and lacks detailed guidelines to achieve this vision. The Master Plan's options for implementation details allow too much flexibility at the small-scale. This allows for continued inconsistency in landscape quality across campus, differences of opinion on preferred designs, and a lack of a comprehensive campus aesthetic.

We need a comprehensive *Landscape* Master Plan, with a shared vision for the overall campus landscape and specific design guidelines, which is agreed upon through extensive public engagement and stakeholder buy-in. Without the full engagement of interested stakeholders in the formal decision-making process for defining the detailed guidelines, it will be difficult to achieve the vision.

2. Unclear Decision-Making Structure

Several factors point to the need for clarity in the decision-making structure related to the campus landscape. Both faculty and students have indicated frustration when seeking a clear and visible authority to coordinate sustainable site development. This message was clearly stated in a November 2018 Senate meeting, which resolved that the proposed landscape master plan “be overseen by some central authority, such as a campus sustainable landscape director, who shall be adequately provisioned with the authority and resources necessary to ensure its successful implementation.”¹

Due to the current confusion in the decision-making structure, too many people feel like they have decision authority over campus landscape issues. This is in part because ‘money talks.’ However, the money talks attitude results in disjointed decisions and physical development; independent decisions can create conflicts between intent and actions. When project stakeholders make decisions about their individual project, they frequently neglect the site development requirements in favor of their own project goals, ignoring the larger, multifaceted campus landscape needs. This is the classic tragedy of the commons that regularly occurs on our own campus. There needs to be an organized and clear decision-making structure to support consistent development of a resilient campus landscape for all university lands.



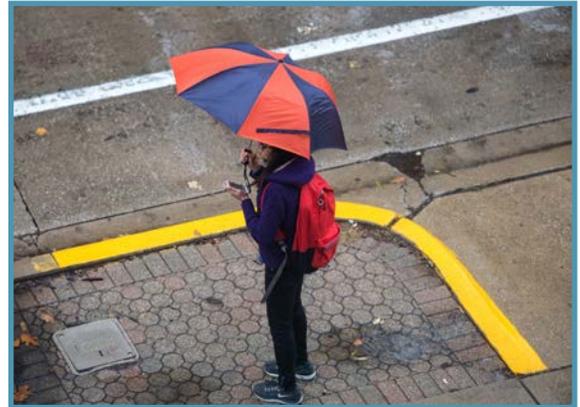
3. Lack of Resilient Rainwater Management

In October 2018, Chancellor Jones, Urbana Mayor Marlin, and Champaign Mayor Feinen issued a joint Proclamation² noting, “action must be taken to ensure the infrastructure of our community is resilient to climate change impacts,” and “climate change impacts such as severe storms, increased rainfall flooding, and extreme temperature variation have already begun to affect Central Illinois.” The need for increased rainwater management is apparent. Many parts of campus experience flooding, the Boneyard Creek and Embarras River both suffer impaired water quality, and existing campus infrastructure is still based on the antiquated mentality that rainwater is a nuisance.

Current design is predominantly grey infrastructure, designed to get the water out of our way and quickly send it downstream. By continuously sending rainwater away, we lose several local benefits. For example, recharging the soil with rainwater could mitigate the need for irrigation systems and the resultant loss of water through evaporation. Rather than treating water as waste, campus should recognize its importance to our campus environmental health. Water is a valuable resource and we need to cherish and protect it for our long-term campus sustainability and resilience.

This can start immediately with a simple transition in terminology: instead of addressing inconvenient and troublesome *stormwater*, we should be protecting and managing our *rainwater*.

When campus infrastructure is designed to drain water away in large pipes and allows water to flood campus pathways and greenspaces, it teaches students water is waste and shirks our responsibilities as stewards of the natural environment. This campus has world leaders and valuable expertise in water management, and the campus environment needs to be transformed to showcase a functional, sustainable model of rainwater management for our students, faculty, staff and visitors. We need a comprehensive rainwater management plan that aligns with our goals and values.



4. Inadequately-Resourced Grounds Department

At this university, there has been an emphasis on the built environment over the campus landscape. Simultaneously, financial constraints have resulted in increased expectations for the Grounds department without sufficient resources to manage the added workload. Specialists who once tended and cared for campus landscapes (i.e., Horticulturists and Grounds Gardeners) are no longer sought after or retained, further undermining the ability of the Grounds department to properly maintain campus. Although the reduction in these skilled technician positions was tied to the pressure to reduce costs, it has actually reduced efficiency and effectiveness. A lack of modern equipment and inadequate facilities and substations further challenge the Grounds department from properly maintaining campus landscapes.

As a result, the backlog of deferred maintenance for the campus landscape has reached a critical level. Landscapes and open spaces have been marginalized and simplified, and

² <https://icap.sustainability.illinois.edu/files/project/4498/Resilience%20Proclamation.pdf>

campus has experienced an overall loss of aesthetic value. Grounds service levels have been reduced, and the diminishment in the campus aesthetic can be seen everywhere. Areas that previously were highly maintained have been simplified or abandoned, with a prime example being the dismantling of several miles of manicured yew hedges. The net effect is prioritization of basic services like mowing, litter pickup, and leaf and snow removal over aesthetics and resiliency.

In order to establish operational excellence, there is a tremendous need to address staffing, facility, and equipment deficiencies. Getting the right people to do the right job with the right training is essential. This need applies not only to F&S Grounds, but to the crews maintaining other campus landscapes for different units.

5. Inconsistent Funding for Landscape Improvements

Currently, landscape improvements are primarily funded through capital projects. There is a need to ensure that capital projects devote adequate funding and support to landscapes. Too often, capital projects see landscape and site development costs as ancillary to their primary project goal. This sets up a situation where site landscape functions and designs are disconnected and disjointed from a holistic campus vision and aesthetic. There needs to be clear expectations for the use of capital project funds in support of landscape improvements.

There is also a lack of consistent funding for landscape improvements that are not part of capital projects. Annual funding for the Grounds department supports maintenance, not landscape improvements, sustainability, or resilience. Although the Grounds budget includes about \$100,000 for Repair and Renovation (R&R) projects, this funding is focused on sidewalk safety repairs and it is profoundly limited in its ability to fund noticeable improvements. Outside of lands maintained by F&S, auxiliary landscape improvements are neither coordinated nor consistent.

Rather than trying to eke out a cohesive campus aesthetic through piecemeal improvements when funding can be cobbled together, we need to provide consistent funding mechanisms for landscape improvements. There are untapped opportunities to fund campus landscape improvements through direct funding, donor engagement, and utility fees. University landscapes will not be multifunctional, resilient and aesthetically beautiful without purposeful funding.

This committee believes that by resolving these five challenges our campus landscapes will reflect the excellence of our institution. In the following five chapters, we provide information about each challenge and suggest solutions to meet them.





LANDSCAPE MASTER PLAN

Landscape Master Plan

The 2017 Campus Master Plan provides a broad vision for a sustainable campus, but this vision falls short when applied to campus landscapes. We recommend that the Chancellor fund the development of a detailed and comprehensive Landscape Master Plan with public input and stakeholder engagement for development of a Shared Vision for campus landscapes. This Landscape Master Plan should include a vision statement and describe how to design and manage landscapes to achieve a more resilient, multi-functional and beautiful campus.

Shortcomings of Campus Master Plan

Landscapes: a low priority

The 2017 Campus Master Plan provides a strategic framework for future growth. It “establishes development patterns to maintain the university’s unique spatial and organizational characteristics, while at the same time identifying potential sites for future building placement and campus placemaking” (page 130). By defining the overall layout of open spaces, the Master Plan framework is an important starting point for establishing a shared vision for a sustainable and resilient campus.

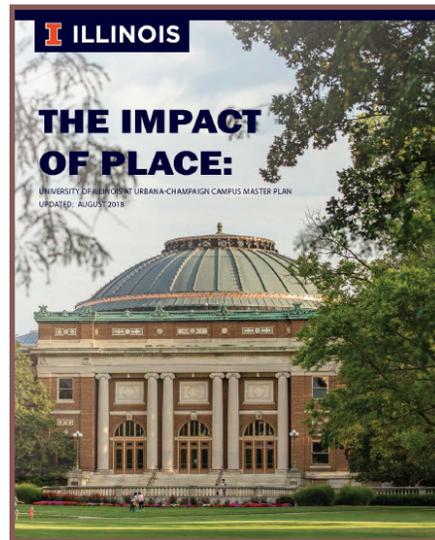
The Master Plan summarizes the sustainability components integrated in the 2017 plan, stating, “In response [to the iCAP], the master plan focuses on opportunities to improve space efficiencies, encourage shared resources, re-purpose underutilized space, and remove underperforming facilities in order to meet a goal of ‘no new net square footage growth’ within the 10-year future. The plan also includes recommendations to improve the multi-modal transportation network for increased connectivity to address the iCAP goal to reduce vehicle emissions” (page 43). Landscape improvements are notably missing in that summary.

After more than 100 pages focused primarily on the building inventory and Net-Zero Space Growth Policy, the Master Plan briefly describes “Landscape Districts and Gateways” and includes a “landscape quality assessment” and a “gateway quality assessment.” The Master Plan also defines Campus Typologies and Gateways (pages 180-187), and the Design Guidelines include objectives for a Campus Landscape Vision and specific principles for campus site development.

Overall, the Campus Master Plan clearly prioritizes buildings over landscapes. While it provides a starting point for a sustainable landscape vision, it is far from complete and does not provide detailed design guidelines to achieve that vision.

Inconsistency in landscape messaging

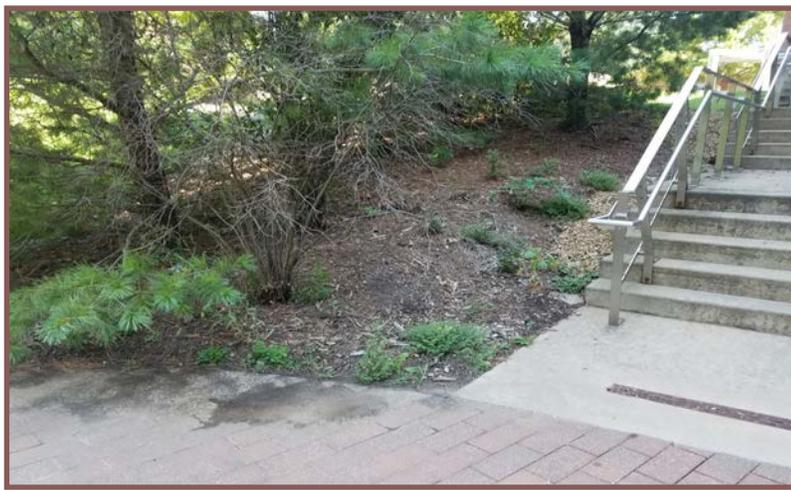
One consequence of a lack of vision and detailed design guidelines is that campus landscapes feel inconsistent and disconnected. The Campus Master Plan notes that “The overall landscape quality varies from district to district. The primary difference is most noticeable in the quality and health of the lawns. Diversity of the plant species across campus is not apparent to the casual observer and is only distinguishable at entry ways and in other high visibility areas” (page 114).





The causes for the inconsistency are in part historical. The University of Illinois landscape development began with the plans of landscape architect Ferruccio Vitale in 1929. His vision of a simple aesthetic shaped this campus with its axial open space arrangements, long rows of elm tree plantings and seemingly endless yew hedges. This design precipitated a large workforce of skilled grounds workers, shearing tens of miles of hedges to perfection, including the ornate topiary that filled the front yard of the President’s House. At that time, the Grounds department not only maintained the campus grounds, but also diligently grew their own plant materials.

Over time, the campus greatly expanded and the historic landscape design was no longer maintainable. Landscape designs became a mix of the historic landscape and a newer aesthetic where environmental concerns started coming to the forefront. Over several decades, any consistent message conveyed through thoughtful landscape planning has become degraded and inconsistent. Historic areas of the campus, such as the Main Quad, have maintained their timeless look, but new development has lost its connection to the campus identity and tends to appear more as a building’s individual statement, thus losing the cohesive qualities needed for a unified campus landscape.



This stairway at the Siebel Center for Computer Science illustrates the disparity between a highly refined stair railing design and an ad hoc planting area adjacent to it.

The concluding statement in the Campus Master Plan notes, “While individual project decisions may seem minor at the time they are made, a series of uncoordinated changes will result in an ad-hoc campus aesthetic.” Although the Campus Master Plan is meant to ensure coordination of design elements across campus, the Design Guidelines from the 2017 plan allow too much flexibility, contributing to the lack of cohesion.

Inconsistency in sustainable design

Without a shared vision and detailed design guidelines, disagreements abound over what counts as a sustainable landscape and what is valued as aesthetically beautiful. For some, there is nothing more valuable and beautiful than a dense prairie. For others, clipped hedges and flowering annuals at graduation put forth the proper collegiate look when donors and alumni are on campus. A tension exists between these two ideals, though proper design can bring them together.

There are many sustainable site development practices already underway on campus. While these practices are becoming more common on our campus, they are not yet the norm in planning and development. Further, there are no minimum requirements for what constitutes a sustainable landscape, which allows site developers the freedom to remove sustainable features to cut costs. Transitioning to sustainable landscape design as the standard for our campus is necessary for the cultural change needed to live sustainably. This transition will require the shared vision and detailed design guidelines found in a comprehensive Landscape Master Plan.

Lack of public engagement

The Master Plan’s guiding principles—including its broad vision for sustainable landscapes—were developed through a collaborative public input process (see Figure 1). General feedback received from several campus and community focus groups included these key landscape-related statements to improve the campus image:³

- a) Enhance the quality of open space – campus landscape is not reflective of the quality of the university.
- b) Key campus gateways are in poor condition. Create a clear sense of arrival.
- c) Deferred maintenance across campus is a serious concern.
- d) Provide more attractive and comfortable outdoor spaces for student interaction

Unfortunately, the draft Design Guidelines (see Figure 2) were not highlighted during the public engagement process. Campus stakeholders on our campus often care deeply about our campus environment, but have different expectations for the best way to implement landscape solutions. Without the full engagement of interested stakeholders in the formal decision process for defining the detailed site guidelines, it will be difficult to achieve a cohesive vision and design guidelines.

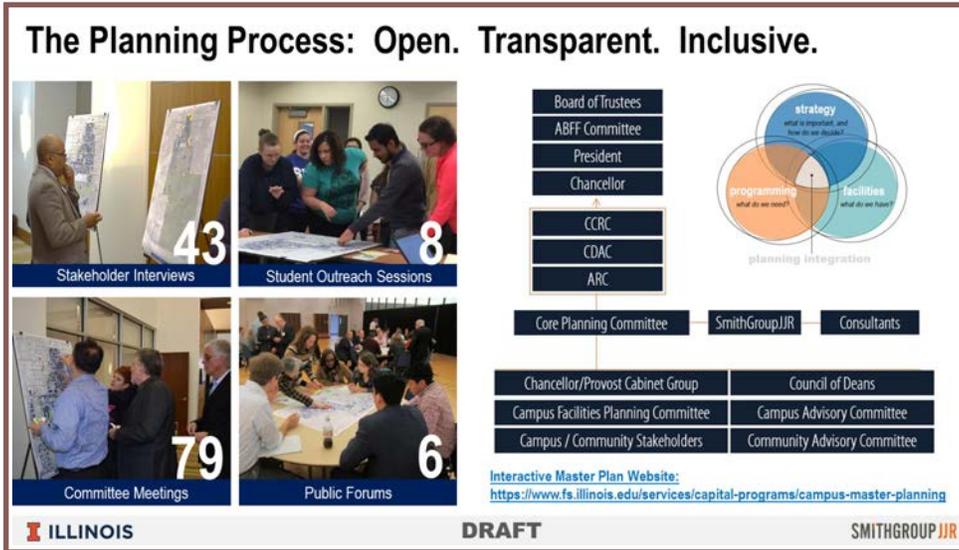
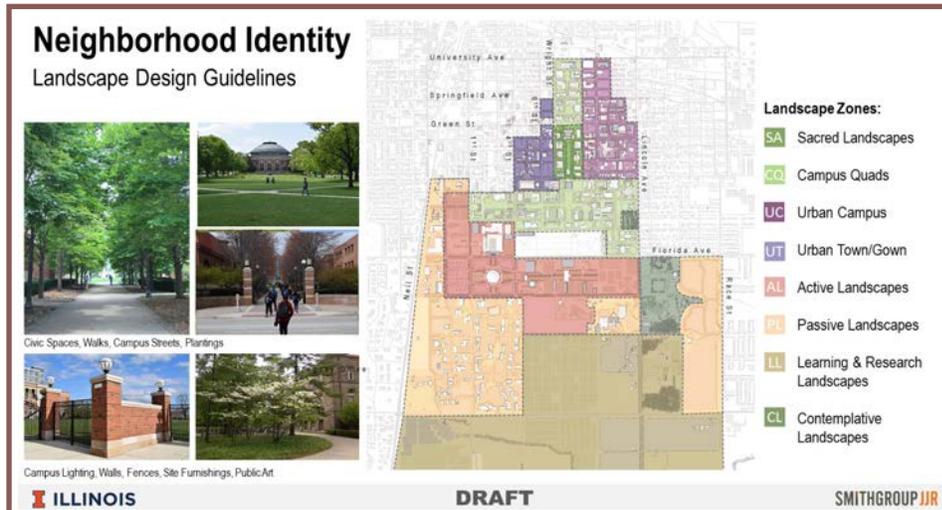


Figure 1 (above): Public Engagement Process for Campus Master Plan

Figure 2 (right): Design Guidelines as presented during Campus Master Plan engagement process



³ https://www.uocpres.uillinois.edu/UserFiles/Servers/Server_7758/file/UIUC/mastpln/uiucmp-cp-201605.pdf



Recommendations

Develop a Landscape Master Plan

To address these issues, the committee recommends the development of a detailed and comprehensive Landscape Master Plan, starting with significant stakeholder engagement to establish a shared vision for the campus landscape. The Landscape Master Plan will also define expectations for site development, F&S Grounds' service-levels, division of responsibilities, and funding mechanisms to achieve the shared vision.

The development of a comprehensive Landscape Master Plan will require:

1. **A steering committee.** At a minimum, the steering committee should include the University Landscape Architect, the Chancellor's Fellow of Indigenous Research & Ethics, two student representatives, a representative from Student Affairs and Auxiliaries, a representative from the Division of Intercollegiate Athletics, and the Senior Associate Provost for Capital. The specific scope of the Landscape Master Plan should be recommended by the steering committee.
2. **An external landscape architecture firm.** We recommend hiring an external landscape architecture firm to provide independent, expert guidance through the process.
3. **Stakeholder and public engagement.** Public input needs to mirror the campus master planning process to achieve consensus about both the overall direction we need to go and the specific site development requirements in each landscape district. There needs to be a realization that this is a team effort, requiring buy-in from every unit on campus. When everyone has an opportunity to voice their opinion, our students, faculty, and staff can ultimately agree both on a shared vision and on site-specific development features.

To launch discussions on a shared vision for campus landscapes, we provide a draft Shared Vision Statement on the following page.

A Draft Shared Vision Statement

The University of Illinois at Urbana-Champaign has a vision to be the pre-eminent public university with a land-grant mission and global impact. This vision does not end at the thresholds of our indoor classrooms and laboratories, but extends across every inch of our campus, and therefore, must encompass the ways we interact with and manage our grounds and landscaping. As the global climate changes and destabilizes, it is imperative to plan for and practice holistic resilience in land usage to promote the sustainability of our campus grounds. Here, we lay out a vision for a landscape ethic at the University of Illinois at Urbana-Champaign to ensure we exemplify our values and prepare for the future.

Illinois prides itself on being a leader. To be a resilient campus landscapes leader, we need to go above and beyond basic state requirements, by creating higher standards for ourselves and adhering to them across all units. Standards that are developed must go beyond the technical details of landscaping to include aspects like community engagement and cultural significance. Our campus landscapes can and should be future-focused, utilizing the cutting-edge technologies and innovations developed by our campus community to become more resilient. Consider, for instance, the potential of a “smart” campus landscape that collects data about landscape use and preferences, rainwater absorption rates, plant disease and more to manage resources more efficiently and create a dynamic user experience.

We envision the campus landscape—the space and environment outside of buildings—to serve as classroom, laboratory, demonstration and collaboration space. Campus landscapes are and should be readily utilized for teaching and research as they provide an opportunity for students, faculty, and staff to practice their expertise and to contribute to the body of University research. Our outdoor environment should also be well equipped to facilitate day to day interactions between all groups. It is within these spaces that connections are made and ideas are shared. It is imperative that the mission of the university extend from edge to edge of campus and beyond.

Students, faculty, and staff should be involved in the implementation of the campus landscape. They should be encouraged to collaborate and consult with the University Landscape Architect in all phases of planning, preparation, and installation of projects. Students, staff, and faculty who are invested in and engaged with the campus landscape are more likely to maintain, defend, and support implementation and maintenance of resilient and sustainable practices.





CLEAR DECISION- MAKING PROCESS

Clear Decision-Making Process

With proper design and direction, our campus landscapes can be vastly multi-functional—providing campus beautification, outdoor classrooms, passive recreation, rainwater management, carbon sequestration, pollinator support, beautiful scenery, and stimulating the mental health and wellness of our community. In order to guide campus in this direction, the university needs to provide a clear system for decision-making. By clarifying the decision authority of the University Landscape Architect, preparing a mutually agreed upon Division of Responsibility map, and establishing a landscape design appeals committee with representation from faculty, students, and administrative staff, we will be able to have a consistent recognizable look and feel across all campus property.

Problems with current decision-making process

‘Money Talks’ attitude

Too many people feel like they have decision authority over campus landscape issues. This is in part because ‘money talks.’ However, in a large organization that is frequently reliant on the largess of donors and politicians, the money talks attitude results in disjointed decisions and inconsistent physical development; independent decisions can create conflicts between intent and actions. Because there is no existing process or enforcement of campus resilient landscape goals there are multiple interpretations and implementations resulting in disjointed and conflicting landscapes. Any uniform message about a resilient campus landscape is lost.

Appeals process undermines importance of landscape

The authority for construction projects is delegated to F&S,⁴ and all projects are required to align with the Campus Master Plan and the associated Facilities Standards. Capital projects follow a standard design process which should ensure that each project meets the established site development requirements; unfortunately, the enforcement of the Facilities Standards does not include a representative for the campus landscape within the variance approval process.⁵

Although the University Landscape Architect is named as a technical expert for “Landscape, Civil Engineering, Site” in the “Standards-Variance Technical Experts List,” he is not actually a decision authority for variances. The decision authorities are named on the “Variance Approval Request Form” in the Facilities Standards. This makes it relatively easy for a project team to get official permission to disregard sustainable landscape designs and practices.

Authority of University Landscape Architect

The Board of Trustees has delegated authority to F&S for all construction projects, including landscapes. Within F&S, the University Landscape Architect (ULA) is the person with authority over all landscape development on campus, including both the lands maintained by F&S Grounds and all other lands under the Urbana Chancellor’s jurisdiction. The ULA aligns campus landscape improvements with the Campus Master Plan by reviewing site plans for capital projects, designing small site and landscape projects, working with donors and the Foundation on issues related to donor tree planting and endowed landscapes, and preparing Facilities Standards to codify resilient landscape requirements.

4 <https://cam.illinois.edu/policies/fo-55/>

5 <https://www.fs.illinois.edu/resources/facilities-standards/variance-process>



Although the University Landscape Architect has Board-designated authority over campus landscapes, many are unaware of or do not recognize this authority. This makes it challenging for the University Landscape Architect to develop and enforce a shared vision for campus landscapes. The ULA's current position is "Landscape Architect / Project Planner" and the reporting structure within F&S hides the ULA at the bottom of the hierarchical structure (see Figure 3).⁶ Unlike the Transportation Demand Management Coordinator, the ULA is not included on the F&S Expanded Management Team (XMT). The XMT includes approximately 40 key leaders throughout F&S, and it meets quarterly to align unit-wide initiatives with campus priorities and strategic goals.

Additionally, until recently the ULA was not included on the F&S website, so it was nearly impossible for an interested stakeholder to know who to contact about campus landscape issues or ideas. The new F&S webpage for the ULA⁷ includes a description of the position's responsibilities, contact information, and a summary of the ULA's campus involvement in various committees and task forces. The ULA webpage also links to the F&S Grounds⁸ webpage which documents existing services, landscape management initiatives, and policies. These updated and new webpages are useful resources, but there is still a general lack of campus-wide knowledge about the ULA's authority over sustainable landscape efforts.

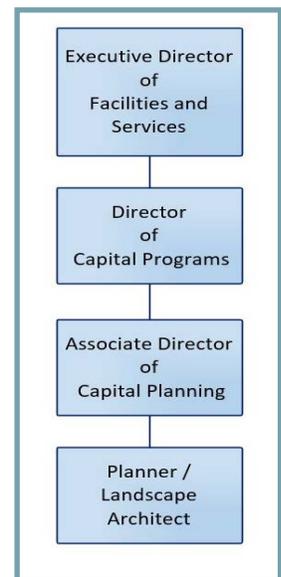


Figure 3: Existing org chart for University Landscape Architect

Competing priorities

The detrimental consequences of current decision-making processes is evident in how campus landscapes are used for events. Most campus landscapes withstand casual use of turf, while other areas see concentrated uses for events and organized activities, which can lead to costly damage. As more and more events are being scheduled on the Main Quad, they contribute to the total annual usage; additionally, some seasonal conditions affect the durability and appearance of natural turf. When reasonable use is exceeded on the Quad, the use becomes abuse and the landscape is



6 <https://uofi.box.com/s/719i1drz2fy49pwygnovdnkrhiji64n3>

7 <https://www.fs.illinois.edu/services/capital-programs/university-landscape-architecture>

8 <https://www.fs.illinois.edu/services/grounds>

degraded. Degraded landscape frequently requires costly renewal work to restore the landscape to a pre-abuse state. The Quad is the most iconic heritage landscape on campus; protecting the health of the trees and turf along the Quad is necessary for maintaining the university's image.

Currently, the ULA does not have assigned authority over a landscape calendar of events and/or uses of the campus landscape. A recent CAM policy revision has allowed the Union the decision authority over whether an event can happen on the Quad. Though they will consult with F&S, authority for use of the Main Quad ultimately now rests with the Union, not with F&S or the ULA. The well-meaning folks at the Union, of course, are not experts in landscape issues. We expect that this will lead to much greater use of the Quad, to the detriment of this heritage landscape.

Recommendations

An organized, clear decision-making process is essential to reduce conflicts and support the consistent development of resilient campus grounds. A clear process begins with identification of a position with authority to enforce campus resilient landscape goals and with the proper resources. This section describes the position of authority and identifies a process which makes enforcement possible.

Establish a Campus Landscapes department at F&S

We recommend establishing a Campus Landscapes department at F&S, led by the University Landscape Architect. This department would have the authority over design of all campus landscape regardless of the geographic location, campus operational area, funding source, maintenance responsibilities, or capital construction project. To establish this department, campus administration will need to:

1. **Clarify the role of the University Landscape Architect and establish a department.** This will involve creating a new title (University Landscape Architect/Assistant Director of Capital Programs, for Campus Landscapes) that reflects the new responsibilities, and documenting that the ULA has full decision authority over all campus landscapes. We also recommend adjusting reporting lines to have the ULA report to the Director of Capital Programs, and adding the ULA to the F&S Expanded Management Team group.
2. **Staff the new Campus Landscapes department.** We recommend creating a new Landscape Architect position to support the ULA, and providing funding support for at least two student employees per year.
3. **Introduce the Campus Landscapes department.** We recommend sending an administrative message to campus to introduce the new department and engaging with other campus stakeholders to establish ULA's authority over campus landscapes.

Create a landscape design appeals process

The Landscape Master Plan will provide a foundation for a landscape appeals process that incorporates campus officials who are responsible and accountable for the resilient campus landscape. The ULA is responsible for determining whether landscape designs match the Master Plan, so this process is to provide a clear path for review of divergent plans and recognition of the costs and benefits associated with the proposed alternative.

In the event a major landscape development plan deviates from the Landscape Master Plan, the Campus Landscapes department should identify the area involved, the planned development for the area, and the deviations from the Landscape Master Plan. The party proposing the alternative



must provide clear documentation regarding the differential cost and aesthetic features of the proposal compared to the campus plan. The description needs to include estimated annual operating costs, estimated environmental and resilience outcomes, and estimated one-time future restoration costs (in present value) to restore the campus vision.

The cost/benefit analysis should be reviewed by the Executive Director of F&S and the ULA, then forwarded to the landscape design appeals committee (see Figure 4). The recommended appeals committee should include input from individuals with the expertise to articulate and understand the effects of deviations from the plan. This appeals committee should have representation from faculty, students, and administrative staff and include a Native American representative. If the landscape design appeals committee approves the change, the party requesting the alternative will be responsible for the associated costs.

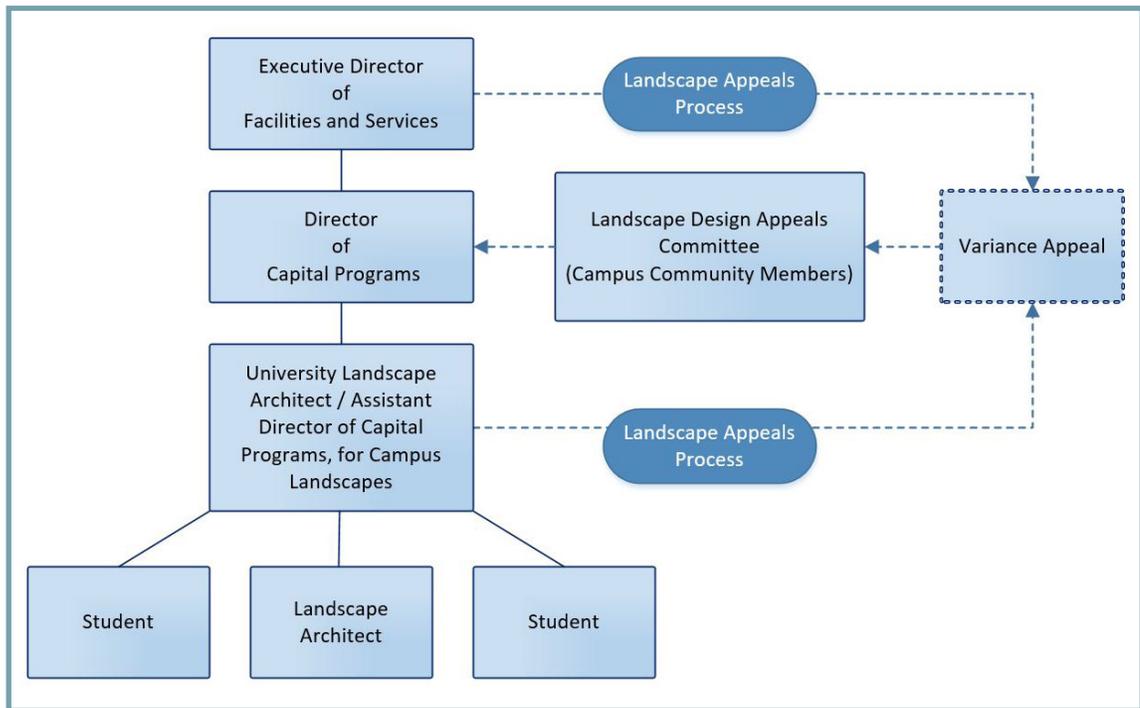


Figure 4: Proposed org chart for University Landscape Architect with Appeals Committee

Revise landscape policies

We propose that the University Landscape Architect lead the Campus Landscapes department in revising policies and outlining responsibilities to support resilient landscapes.

1. **Division of maintenance responsibility.** We recommend creating a detailed division of maintenance responsibility map for the University District. This process has begun with transportation infrastructure and should continue until maintenance responsibilities for all exterior site elements are clearly documented and agreed upon. The F&S Grounds department maintains 930 acres, including 178 acres for University Housing and 182 acres for the Parking Department. Housing and Parking are responsible for the cost of maintaining their respective campus areas, just like Grounds is responsible for maintaining the other 570 acres in the core campus. However, none of these departments have the authority to determine campus landscape designs. There should be a clearly documented map with roles and responsibilities for providing operating and maintenance services for the resilient campus landscape.

2. **Campus landscapes calendar.** A campus landscapes calendar should be used to balance the needs for campus outdoor events against the ability of the landscape to be fully resilient. The ULA should identify the maximum number of hours landscape areas can be used for various events, and permit scheduling within the hour limits. The ULA may adjust the limit at any time in response to environmental and other conditions but must provide clear rationale for the adjustment when approving or denying an event. Included with the campus landscape calendar may be a fee or usage deposit that represents the cost to restore the campus landscape to a pre-event condition. The overall goal of the limited hours and fees is to ensure the campus landscape continues to provide the visual and environmental image reflective of this world-class university.

3. **Academic collaborations.** To facilitate using campus landscapes as Living Labs, we recommend that the Campus Landscapes department prepare information about existing collaborative opportunities and clear directions for how to initiate Living Lab requests about campus landscapes. This can be done through edits to the F&S website, under the “Landscape Architecture” page⁹ and within the “Academic Collaborations” page. Collaborations should be publicized and reported on by the Campus Landscapes department, the collaborating entities, and through the iCAP Portal. As a priority, the ULA should initiate collaborative projects with the American Indian Studies department and associated Indigenous groups.



⁹ <https://www.fs.illinois.edu/services/capital-programs/university-landscape-architecture>



EXEMPLARY RAINWATER MANAGEMENT

Exemplary Rainwater Management

A world-class university built on a former wetland has great potential to be a global leader in exemplary rainwater management. The need is apparent – many parts of campus experience flooding, which is expected to increase with climate change as reported by recent updates to Bulletin 70 (authored by Prairie Research Institute scientists).¹⁰ Impervious surfaces of buildings, streets, sidewalks, and parking lots shed water quickly, but these hard surfaces exacerbate flooding during heavy rain events. Often, water runoff washes dirt, oils, litter, and other pollutants from impervious surfaces directly into the storm sewer system, and campus’ two receiving streams (Boneyard Creek and Embarras River) suffer impaired water quality. Practices to mitigate economic and environmental harm from flooding need to be implemented. University faculty and staff can meet these challenges and transform them into opportunities for research and showcase a functional, sustainable model for our students, faculty, staff and visitors.

Current conditions are outdated

As noted earlier, instead of addressing inconvenient and troublesome *stormwater*, we should be protecting and managing our *rainwater*. Existing rainwater management is primarily conventional “grey” infrastructure, including 101 miles (active collectors documented in UI GIS) of storm sewers, and 81 miles are owned by the university. Our host cities own the rest of the storm sewers, and the university pays stormwater utility fees. Although some examples of Green Infrastructure exist on campus, a comprehensive rainwater management plan – with inherent financial efficiencies of scale – has not been developed.

The iCAP, Campus Master Plan, Design Guidelines, and Facility Standards all recognize the importance of sustainably managing rainwater and runoff, carbon sequestration, and a need to move away from fossil fuel dependent landscapes. The University’s Stormwater Permit with the Illinois EPA (MS4 NPDES ILR40)¹¹ specifically calls for Green Infrastructure in new development and in redevelopment. It emphasizes a watershed approach to planning and encourages rainwater structures that serve multiple sites. Although the Facilities Standards mandate Low Impact Development design and Green Infrastructure, it is not sufficiently detailed to be useful and was generally not followed. Recently, the Facilities Standards were updated to include a section for Green Infrastructure. The Green Infrastructure section details both the expectations of the university as well as specific design details that should be incorporated. A specific goal of detaining the water from a 1 year / 24-hour storm event is included, but it is not currently required.



¹⁰ <https://www.isws.illinois.edu/statecli/RF/rf.htm>

¹¹ <https://www2.illinois.gov/epa/Documents/iepa/water-quality/surface-water/storm-water/ms4/general-ms4-permit.pdf>



Best Management Practices (BMPs)

Emphasize ‘landscape literacy’

With an ever-increasing expectation of heavy rain events, the campus landscapes should be designed in a resilient manner. The University of Illinois should implement exemplary rainwater management and draw on its strengths in an artful, educational, and intelligent way. The concept of “landscape literacy” – using design to teach communities how to ‘read’ and shape the landscape around them – can help tell the story of the Illinois landscape, its changes and challenges, and its restoration. The very disciplines that altered the tallgrass prairie in the first place – engineering and agriculture – can play a role in reimagining it along with landscape architecture and ecological sciences. A pilot for this concept on campus is the Red Oak Rain Garden’s renovation. Its native planting plan reveals underlying lines of topography and flow paths determined by an engineering study, which might otherwise remain hidden. Signage further reveals the features of the land and encourages interaction and enjoyment.

By connecting design students to the campus environment and funding implementation of their concepts, we can both broaden their practical understanding of the pragmatic aspects of design concepts and instill a stronger emotional attachment to the campus. Our students have previously proven to have winning ideas. In 2017, a group of our students won the annual US EPA RainWorks Challenge¹² by redesigning parking lot F4, which is prone to flooding and in consideration for repairs. The students’ design included permeable pavement, a rain garden, bioswale, trees, and a disconnection of pipe drainage from rooftops.



Image from 2017 RainWorks Challenge

Green infrastructure

The 1,630 acres in the University District includes green space, space covered by buildings, and paved areas (including parking lots, service drives, bike facilities, and walkways). South of Windsor Road, the university owns and maintains an additional 3,400 acres of mostly agricultural land. All university lands should incorporate green infrastructure, with a priority focus on:

1. Bioinfiltration cells (including rain gardens) with native plant restoration,
2. Rainwater harvesting for reducing pressure on the Mahomet Aquifer—designated a sole source aquifer by the US EPA,
3. Permeable pavements and de-paving when possible,
4. Bioswales for parking lots and roadways,
5. Increased tree plantings, and
6. Green roofs and walls.

Parking lots provide a prime opportunity to implement and showcase rainwater management. All new parking lots should incorporate permeable pavement surfaces, bioswales to capture excess runoff, and tree plantings. All existing parking lots should be reviewed and brought

¹² <https://icap.sustainability.illinois.edu/project/epa-rainworks-challenge>

up to 21st century standards when they need to be renovated or rebuilt. Permeable pavements are designed to absorb rainwater. For example, the Morton Arboretum in Lisle, IL, installed a permeable surface in their main parking lot composed of interlocking concrete pavers with one-inch holes filled with gravel. Water flows into the holes, through the gravel, and into a four feet deep layer of gravel beneath the pavers. Bioswales are an important component of 21st century parking lots. Bioswales are generally concaved medians between or at the edge of parking areas where surface water can flow. They are designed to retain water for a short period of time after heavy rain events. Most importantly, bioswales are planted with carefully selected plant species to help trap sediment, pollutants, and aid with water infiltration. Trees in parking lots improve



In this example, Indiana University has incorporated a highly functional bioswale as the main focal point of one building's foundation landscape.

the appearance, provide shade, help capture carbon, and dampen wind and noise, but care must be taken when selecting and planting trees in parking lots. Tree “islands” must be designed to allow for adequate growth and filled with appropriate soil. Similar to bioswales, curb cuts should allow surface water to flow into tree islands.

Likewise, increasing the tree canopy throughout campus is another opportunities to improve the resiliency of our landscapes. Additional trees act passively and efficiently to combat the detrimental effects of climate change. Campus should engage students and faculty in a project to map the current urban canopy and determine ground coverage. An analysis could then be done to identify additional areas for tree plantings and associated environmental benefits. With lifespans of 100 plus years, and relatively minimal required resources, trees should be prioritized as a university asset. Their multifunctional abilities and low costs provide for a solid return on investment. The current tree canopy realizes approximately \$1.5 million annually in environmental benefits. This does not include the less tangible benefits like shading for pedestrian ways and overall campus aesthetic improvement.

Our trees also provide a direct connection to this land and the people who inhabited it in the past. In 2018, a tree was planted in recognition of Indigenous Peoples Day. The maple species was chosen as it represents a connection to the culture of the people who originally inhabited these lands. It is their hope to eventually tap this tree to make maple syrup, illustrating their long-term commitment to being stewards of this landscape.



Green roofs are typically more expensive than surface practices; however, in the denser, more urban parts of campus, green roofs may be most appropriate and should be considered. Green roofs can also be considered artistically, such as the green roof treatment currently being installed on the Illinois Street Residence Dining Hall. Green walls can also be grown in some locations, such as the green wall on the west side of the Electrical and Computer Engineering Building on Wright Street.

Agricultural lands

To reduce nutrient runoff, University agricultural land should include conservation practices recommended in the Illinois Nutrient Loss Reduction Strategy’s Science Assessment. Wetlands—a particularly cost-effective way to reduce nitrate-nitrogen loss—are also effective for flooding mitigation, if designed with this aim in mind, and should be considered where these multiple goals overlap. Further, appropriately designed wetlands can have ancillary benefits including enhanced habitat as well as a potential source of irrigation water for future farming resiliency.



The University of Illinois has the expertise and imagination to invest in exemplary rainwater management. Boneyard Creek on campus is home to the oldest urban USGS gauging station in the nation. This station and the stretch of creek by it were part of the Nationwide Urban Runoff Program, 1983, a multi-year assessment on nonpoint source pollution that formed the basis for national stormwater regulations.¹³ Our Midwestern native plants, many of which are celebrated by European designers such as Piet Oudolf while being overlooked at home, are beautiful. The popularity of Oudolf’s Lurie Garden in Chicago has brought recognition to native plant aesthetic value and some have been established on campus. The plants also have functional capability for rainwater management, support wildlife, and have historical meaning to Illinois’ Native Nations.

Recommendations

It is time for our campus to understand our hydrologic history and value our natural resources, celebrating them visibly so we can be proud of our efforts for generations to come. We recommend the following strategies to ensure that the best management practices described above are implemented.

13 https://www3.epa.gov/npdes/pubs/sw_nurp_vol_1_finalreport.pdf

Increase education and engagement

1. **Staff education.** A selection of grounds employees from F&S, DIA, and Campus Rec. should be certified through the National Green Infrastructure Certification Program (NGICP) or equivalent to ensure the green infrastructure is designed, installed, and maintained correctly.
2. **Educate communities.** The Campus Landscapes department should collaborate with Illinois Extension to translate landscape project information into outreach products to educate campus, community, and the state of Illinois. Students and faculty should be engaged in research projects to support resilient rainwater management.
3. **Fund a recurring student design competition for resilient rainwater infrastructure and fund the related installations.** We recommend that the competition be modeled after the University of Chicago design competition and be initiated through a collaboration between F&S and the College of Fine and Applied Arts.

Require BMPs for rainwater management

Codify the university's MS4 NPDES Permit No. 400523¹⁴ post-construction requirements into campus requirements for green infrastructure in all new development, redevelopment, and existing landscapes. Change the Facility Standards goal of detaining the water from a 1 year / 24-hour storm event, to a requirement.

Create and follow a comprehensive rainwater management plan

To meet these requirements, we recommend that the university fund the creation of a campus rainwater management plan. The plan will identify priority locations for green infrastructure, the associated capital costs, and the long-term maintenance costs. Design and maintenance guidelines will be based on the best practices listed above. This plan will include detailed design guidelines for Green Infrastructure and give authority to the ULA to enforce these guidelines for new projects.

14 <https://www2.illinois.gov/epa/Documents/iepa/water-quality/surface-water/storm-water/ms4/general-ms4-permit.pdf>





EFFECTIVE AND EFFICIENT F&S GROUNDS

Effective and Efficient F&S Grounds

The Grounds department does not have the resources to effectively and efficiently maintain landscapes at current levels, let alone realize the long-term sustainability and resilience goals of the proposed Landscape Master Plan. We recommend providing proper resources for the Grounds department in a way that aligns with the campus expectations for our outdoor campus environment. Service-levels by zone, the allocation of Grounds budget resources, and the departmental staffing plan should all be reviewed and revised to take long-term maintenance, landscape sustainability and resilience, and aesthetic goals into account.

Grounds deficiencies

Staffing levels and classifications

The F&S Grounds department is responsible for maintaining 570 acres of our campus landscape, with direct funding from the campus. An additional 360 acres that are the financial responsibility of two auxiliaries (self-supporting units), Housing and Parking, are maintained by F&S Grounds for an associated fee. Several other entities maintain their own areas, with only occasional interaction with Grounds. Campus Recreation and the Division of Intercollegiate Athletics typically only contract with Grounds for tree work. Allerton Park also has their own staff. The Research Park is mostly maintained by the developer or through their lessees, though some areas are F&S maintained. ACES maintains the majority of their land, and the Arboretum has a select few staff members as well.

The July 1, 2019 approved Grounds staffing level (“complement”) includes 47 employees: 1 Superintendent, 1 Foreman, 4 Sub-foreman, 2 Tree Surgeons, 1 Equipment Mechanic, 1 Maintenance Worker, and 37 Grounds Workers (see Figure 5). As of June 2019, only 41 of the positions are active, with four being vacant, and two employees on total disability. The Superintendent also serves as the horticulturist since that role was never backfilled when he accepted the superintendent position.

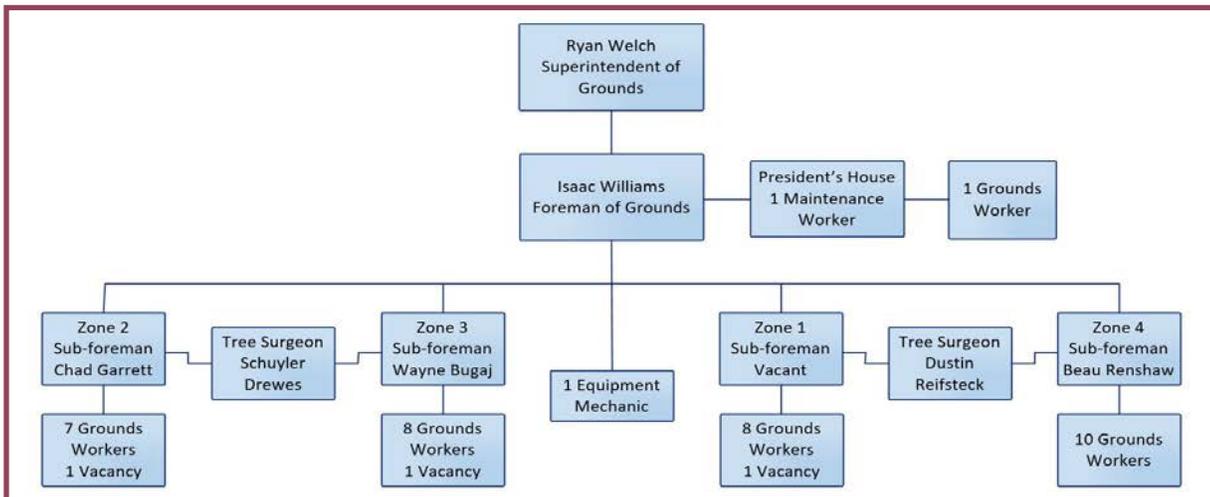


Figure 5: Existing org chart for F&S Grounds department, as of July 1, 2019

A common metric for comparison with peers, is the number of full time employees (FTE) divided by the total acreage for those employees. In the FY18 Sightlines survey (see Figure xx), our university ranked in the bottom 3 out of 10 peer Big Ten institutions in terms of landscape staff per acre of land managed. These institutions averaged 25.1 acres per FTE while the Urbana campus had 29 acres per FTE, at that time.





This appears to be a simple calculation, but there are several ways to define the number of employees. Considering the F&S Grounds staffing levels at the start of FY20, we can count the 37 Grounds Workers positions approved at F&S. Alternatively, we can count the 34 Grounds Workers currently employed at F&S. We can also count just the 32 Grounds Workers who are actually active maintaining the campus, and not absent for total disability. The results vary from 25.1 to 29.1 acres per FTE.

- 930 acres / 37 Grounds Worker positions = 25.1 acres per FTE
- 930 acres / 34 Grounds Workers currently staffed = 27.4 acres per FTE
- 930 acres / 32 Grounds Workers active on campus = 29.1 acres per FTE

To serve the campus needs, at a level commensurate with our Big Ten peers, F&S needs to increase the basic number of active Grounds Workers. Furthermore, the current work force does not have extensive training or experience in landscape management. Grounds Worker is not a specialty position. With the increase of native plantings and a call for more diversity in planting beds, there is a need for a more skilled workforce. In particular, there is a need for Horticulturists, Ecologists, and Grounds Gardeners to bring campus aesthetics up in quality. With the increase in the use of non-horticultural native plantings, additional training and certifications are needed for successful maintenance. Leadership in Energy and Environmental Design (LEED®) driven projects continue to push the envelope of what the current work force is able to handle. Increased pollinator support around buildings and in our low-mow areas will also necessitate a different set of skills than what is currently available. Just as the zone organization promoted ownership and pride in the work of the Grounds' staff, actively investing in their knowledge can lead to improved maintenance activities and campus aesthetics.



For Tree Surgeons (certified arborists), the organization chart lists two positions, which are meant to work as two teams. However, because the assistants to the arborists require special training and skills, the two Tree Surgeons have been assisting each other, essentially combining into a single team and achieving less. By hiring two Tree Assistants, the existing Tree Surgeons would be able to achieve twice as much without doubling the expense. Campus has over 16,000 trees with 12,000 under complete control of F&S and 4,000 under auxiliary control with F&S assistance as-needed. At those levels, this single tree crew mostly handles dead/dying tree removal, with very little preventative maintenance and pruning of existing trees.

In a recent review of tree staff of the cities of Champaign and Urbana, the university sits at the bottom of the three. Urbana has approximately 11,000 trees and has roughly 5 full time employees dedicated to trees. Champaign typically has 5 full time employees but with the ash tree removals has added two more to assist with their 22,000 trees. In both cases, the city arborists note that they are not adequately resourced to fulfill their duties. Given that the university is judged on its urban canopy, the standard of care should be higher than the care given to street trees for the surrounding municipalities.

With the influx of tree planting from new construction and from replacement trees, additional staff will be needed for structural pruning, as well as for pruning of our aging tree canopy. Likewise, with iCAP objectives to increase the tree count on campus for the benefit of carbon sequestration, as well as for aesthetics and the reduction of ambient temperatures, the Tree Crews should be focused on maintaining excellent health of our existing tree inventory and increasing the overall tree canopy on campus. To maximize the impact of our tree crews, we should reallocate tree removals to an outside contractor, allowing tree crews to shift focus to tree health and aesthetics.



Our urban forest plays a pivotal role in many campus goals, and its proper care is pivotal to our success. Thus, an emphasis should be put on adequately resourcing the university's arborists.

Ultimately, because the goal of this Resilient Landscape Strategy is to provide superior care and service for campus landscapes reflective of our world-class status, we recommend multi-faceted changes in the F&S Grounds staffing.

Outdated equipment

Equipment used by F&S Grounds is outdated and in need of replacement. Without proper resources, tools and machines have been continually fixed or cobbled along to a point where they have long outlasted their safe working limits. In some cases, expired machinery is simply not replaced or repaired for long periods of time. Other times, equipment is rented or work is put off for a later date.

Equipment available to Grounds Workers includes gasoline engine riding mowers, string trimmers and other hand tools, pickup trucks, a mini-garbage truck, a large wood chipper, and smaller 4 wheeled vehicles. One larger electric mower is also in use at the President's House grounds, which has worked very well. However, the conventional mowers are also required for snow removal in the winter time. Large electric mowers are not currently able to perform at the same level as a gas-powered mower. Though it may be a benefit in such places as our quad systems, we do not foresee the need for many more large deck electric mowers.

Some funds have been allocated toward using more battery powered hand tools. This transition began in 2016 and advances us toward goals of reduced emissions, while also allowing our staff to more comfortably perform their work at a tolerable sound level, which is greatly appreciated by students and staff. Many tools have been replaced through this initiative, consisting mostly of string trimmers, hedge trimmers and small push mowers.

Departmental substations

F&S Grounds is based in the main Physical Plant Services Building (PPSB) and has a facility on south Lincoln Avenue to store and compost landscape waste. At the Lincoln Avenue facility, Grounds used to grow their own materials, including trees and shrubs but this practice has since been abandoned. Greenhouse space was also utilized in the past for growing annuals, but these have been removed from campus as well. Thus, all plants need to be purchased from local and regional vendors, whose supply is not always consistent, nor always locally grown. Several peer institutions grow some of their plants, including annuals, like Indiana University. In the case of





Penn State, they manage their own turf farm as well, so their specific needs can be met on demand. Recently, the ULA has begun collaboration with the Horticulture Club to grow pollinator friendly plants to be installed on campus. Historically, space for Grounds has not been implemented on campus in a cohesive and permanent way. Instead, Grounds has informally claimed small areas for their needs when possible, but often with the knowledge that they will have to move when new development comes.

Although there are several small substations throughout campus the majority of work starts and ends from PPSB or the Lincoln Avenue facility. As campus has grown, staging the majority of work out of these two locations has decreased the efficiency of Grounds Workers. In an attempt to increase efficiency, several small substations have been put in place. These substations vary greatly in size and ability to service campus. Some are in small open areas and only stage clippings, mulch or stone, while others allow vehicle parking, room for breaks, small equipment storage, work space, restroom facilities and internet. Not having proper facilities spread throughout campus requires workers to make many trips back and forth, daily.

Consequences of under-resourced Grounds department

Low service-levels

The service-level defines expectations for F&S Grounds in areas around campus. Appendix A provides details about current landscape maintenance service-levels, including an overview of the nationally recognized APPA service levels, ranging from exceptional (level 1) to completely natural (level 6). Current service-levels for the majority of campus generally fall within APPA levels 2 and 3. Notably, there is no space on campus that is maintained at service level 1.

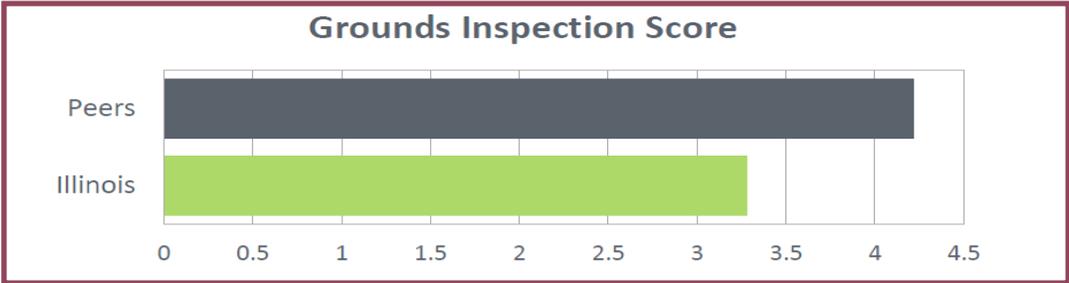


Figure 6: FY18 Grounds Inspection Score compared to Big Ten Peers

In agreement with the recent call for an improvement in campus aesthetics, the FY18 Sightlines report gave the University of Illinois a score of 3.25, compared to the average peer institution score of 4.25. This finding is also consistent with informal feedback received from a peer university landscape architect, who noted the campus grounds are consistently on the lower end in the Big Ten.

Long-term aesthetic decline

Low staffing levels and limited resources for F&S Grounds and campus landscapes has necessitated many structural changes to the landscape fabric. These changes have often been made passively as focus has shifted to other areas on campus. Both passive and active changes have been numerous and all affect the campus landscape aesthetic. These include the following:

- Planting beds and landscaped areas have been reduced and replaced with larger turf or mulch areas.
- Annual installations in beds or specialty accent planters have been greatly reduced, which are especially important in early spring with graduation.

- Plant material around buildings has been reduced, focusing on main entries.
- 82 acres have been converted to generally unmanaged “low mow” zones, without maintenance for aesthetics.
- Much of the lawn areas outside the highest service-level areas have had herbicide applications greatly reduced or eliminated, leading to an inconsistency in lawn appearance. Campus clients may perceive a favoritism for certain locations, regardless of intention.
- Miles of formal yew hedges have been removed. In some cases, the removed hedges have been replaced with native grasses, to varying success.
- Smaller courtyards between buildings, intimate spaces according to the Master Plan, have often been neglected, as resources tend to concentrate on larger areas that are more visible to the community. These courtyards should be quality space where collaboration and interaction is facilitated by a rich exterior environment. These include areas like the small courtyard behind the Irwin Doctoral Study Hall, the courtyard south of the Medical Sciences Building, and the Chi Omega garden.
- Trees in distress due to fungal, bacterial, or insect infestation are often no longer cared for. They are allowed to die without proper intervention.
- Dead limb removal for campus trees has been postponed and priorities have shifted to tree removal or assisting capital projects as necessary.
- The practice of “abandoning in place” has become commonplace for older amenities like bike paths, instead of reclaiming the green space and removing hardscapes.
- Large amounts of failed pavers, walks, and plazas on campus have been patched or ignored, leaving exposed edges where pavements may suddenly drop several inches, leading to dangerous conditions for pedestrians.
- Many campus-owned sidewalks have structural issues that cause pedestrian hazards and may impair compliance with ADA requirements and mobility of our students, faculty, and staff. An ADA transition plan was created to identify these areas in need of remediation for compliance.
- With a reduction of staff, there is a reduction in ‘eyes on campus’, keeping track of contractors and delivery vehicles who violate established standards, by parking vehicles and equipment under trees, driving through areas that are outside of construction and off limits, creating large ruts and damaging turf and landscape areas.

Based solely on this list, it is reasonable to assume that the campus landscape will continue to deteriorate, even as campus expands and adds new facilities, if staff levels are not increased and adequate resources are not provided.



Recommendations

Just as a bold effort has been made for the deferred maintenance backlog for buildings, an equally bold effort should be made to address deficiencies inherent in the landscape and in the primary group that maintains it. This effort should focus on bringing the campus landscape and Grounds staff up to peer standards, and even higher to reach the landscape vision of a world-renowned university. We make the following recommendations to effectively and efficiently maintain campus landscapes.

Increase F&S Grounds staffing complement

To meet the needs of our sustainable and resilient landscapes, the Grounds department requires a skilled workforce. To that end, we recommend that F&S:

1. Increase the number of Grounds Workers from 37 to 40.
2. Reinstate the position of Grounds Gardener, and hire two Grounds Gardeners.
3. Reinstate the Horticulturist position, and hire one Horticulturist. The Horticulturist will report to the superintendent, handle all planting plans for annual events, and serve as a subject matter expert for the Campus Landscapes department.
4. Hire at least one Ecologist to join the F&S Grounds crew. The Ecologist will assist with the management of natural areas, including green rainwater infrastructure. This position will also be responsible for training related stakeholders, both within F&S and in other departments on campus.
5. Reinstate the Tree Assistant position, hire two Tree Assistants, and properly resource the crew with equipment. Reallocate tree removals to an outside contractor, allowing tree crews to shift focus to tree health and aesthetics.

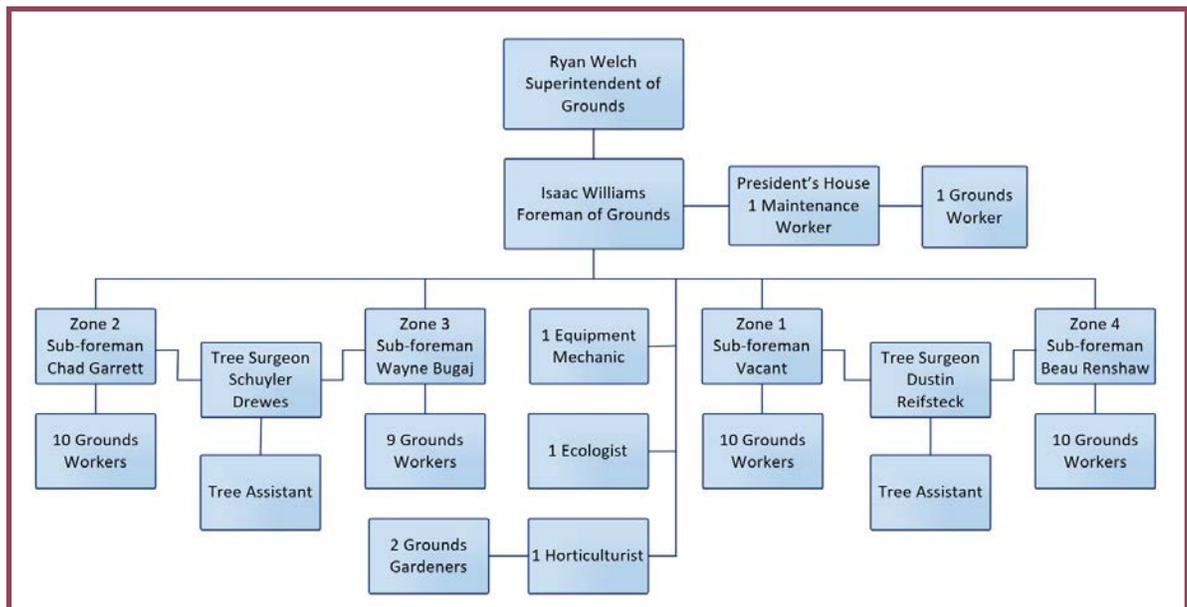


Figure 7: Proposed org chart for F&S Grounds department

This will require a change in the Grounds staffing complement from 47 to 56 (see Figure 7). Finally, during the Landscape Master Planning process, the service-levels throughout campus should be reevaluated during the engagement efforts to confirm shared expectations.

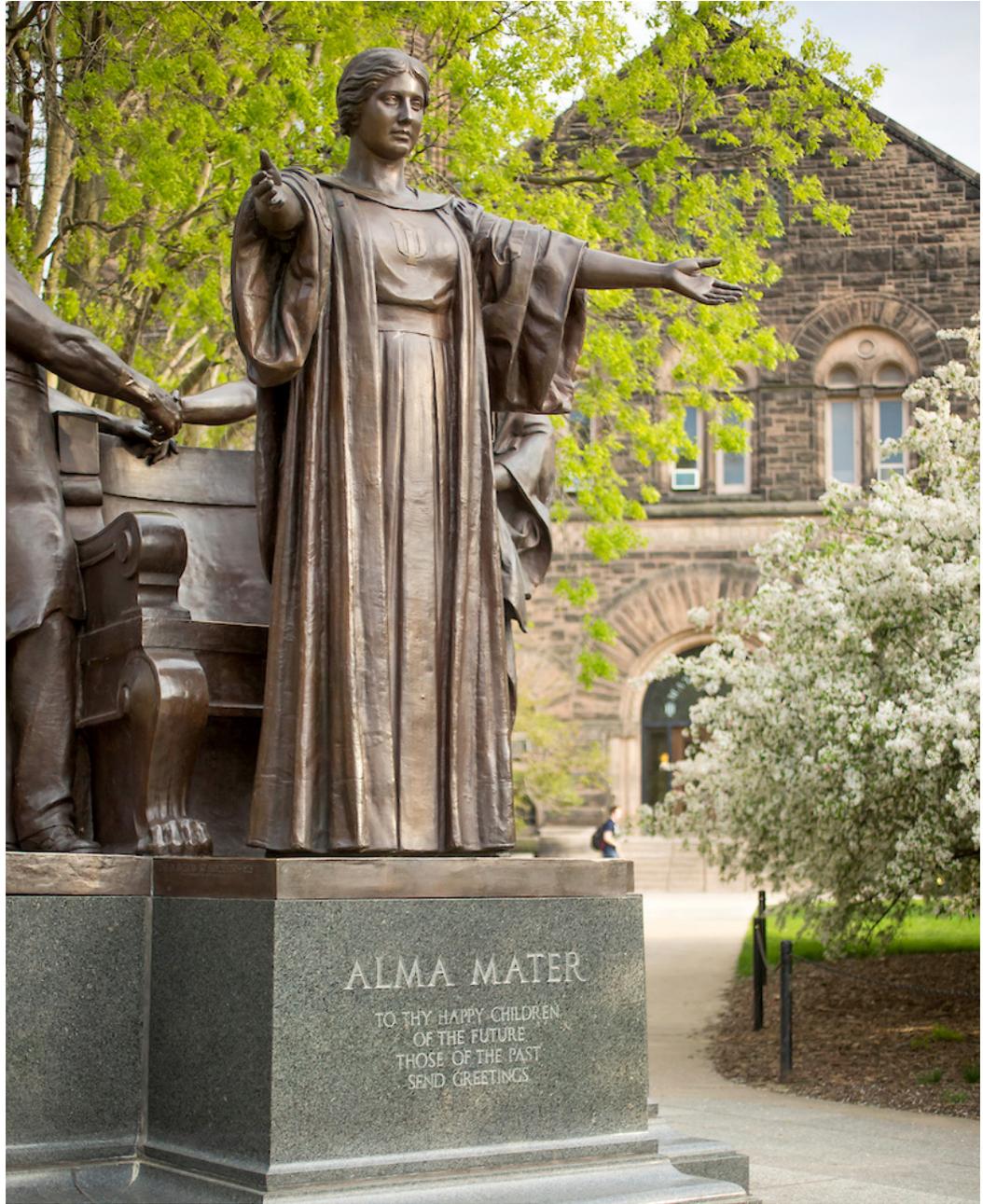
Train grounds staff for all units

Grounds staff should receive additional training on green infrastructure, native plant maintenance, and traditional ecological knowledge. Partnerships with Parkland College or collaborations with UI faculty and staff could be pursued to create short learning courses. This training should be done in collaboration with other unit's grounds maintenance staff, such as Athletics and Campus Recreation. It is imperative that all staff receive proper training to maintain a cohesive campus aesthetic.

Provide appropriate equipment and facilities

1. **Update F&S Grounds equipment.** Evaluate F&S Grounds' equipment for replacement and new equipment needs and develop a plan for funding. Equipment should be assessed for replacement with inefficient, hazardous, and aging equipment at the top of the list. Investing in newer equipment will reduce downtime for repairs, while allowing us to take advantage of technological advances. The use of other newer technologies should be explored, including autonomous mowers for difficult to maintain areas where turf is previously established, such as in interior building courtyards.
7. **Continue transition to electric equipment.** Smaller tools should be converted to electric to reduce emissions and sound levels. Electric four-wheeled utility vehicles should also be researched and strategically deployed, especially where their asset as a silent workhouse would be of particular value to the campus.
8. **Plan for appropriate substation facilities.** Identify underserved zones and incorporate Grounds substations throughout campus. Explore the potential for growing new plants on campus, underscoring long-term benefits and costs. Efficiencies depend on quick deployment and easy access of equipment. Campus planning should include provisions for substations, which should be considered critical infrastructure.





FUNDING SOLUTIONS

Funding Solutions

As this university implements the first year of the Integrated and Value-Centered Budgeting, continuing to emphasize flexible and cost-effective funding solutions is vital. As the provost website says, “Optimal use of available resources is one of the most critical issues that we face as a university.” To that end, we reviewed existing and potential funding mechanisms for realizing a resilient campus landscape and recommend ways to optimize these funding mechanisms.

Existing and potential funding mechanisms

Capital project funding

Landscape improvements on campus are most often funded as part of a capital project’s site design and installation. These landscape improvements include the site around a capital project building and infrastructure projects like MCORE. Whether it is a building, transportation, or utility project, the core purpose of the project is the focus of the primary client, the design team, and the major stakeholders. The exterior landscape is often an afterthought or simply a method for achieving extra points in the LEED system. Additionally, these projects have highly defined, rigid, yet arbitrary, project boundaries, so they focus inward from the site boundary, unable or unwilling to address the larger campus needs beyond their specific project boundary.

The total project budget is focused upon maximizing the core goal of that particular project, such as more classroom space. Naturally, it does not prioritize improvements to the outdoor space around a building or adjacent to a large infrastructure project. Because the outdoor landscape is not the capital project’s priority, when a project budget gets tight, a common decision is to reduce the landscape design complexity or rainwater management plans. This is a shortsighted outcome, as our outdoor space functions as collaboration and study space, as well as allowing students and staff to connect with nature and decompress from their high-pressure lives. There are numerous examples of projects that become inward focused to the detriment of the campus landscape. Below are two recent examples.

LIFE Home

LIFE Home,¹⁵ a capital project through the College of Applied Health Sciences, received research grant funding to build a “multi-function space to support research, education, and community outreach activities” in a formerly open field off of First Street and Windsor Road. The Facilities Standards state that projects must use green infrastructure in any new facility, but the design team decided to minimize all site elements and simply drain all water off of the site. As the majority of the site was to become impervious area, more water would be leaving the site after construction, which is against campus standards. Even minor amounts of water runoff can cause flooding or other negative effects downstream.



The clients consistently pushed back against the recurrent technical guidance of the ULA, only acquiescing just as the project entered the bid process. At that point, the project designers ended up designating funds to use for green infrastructure, allowing them to add in bioswales and design drainage pipes. However, as a last minute add, the system was not properly vetted by their design team, and brought the project \$200,000 over budget during bidding. This resulted in more pushback and contacting higher administrators requesting that all of the improvements be removed from the project.

¹⁵ <https://chart.ahs.illinois.edu/lifehome>





These improvements are important to campus as a whole and meet the Facilities Standards. Fortunately, the University Landscape Architect was ultimately re-engaged and a better solution was offered. However, it was only after firm persistence against unnecessary resistance to the campus requirements that proper design occurred.

Siebel Center for Design

A more visible example is the Siebel Center for Design. The donor for this project initially provided \$25 million that was matched by the University, for a 60,000 GSF facility. The intent was to design a facility that would inspire creativity and provide a conduit for collaboration, exploration of ideas and future innovation.



As the building was meant to demonstrate and inspire forward thinking, a water reuse system was introduced. This would have cost approximately \$75,000 (approximately 0.2% of the construction budget) and would align with the iCAP goals for water reuse. However, in the value engineering phase—seeking to increase GSF while staying within budget—this sustainable innovative item was cut out of the project, although the underground detention modules were designed for future reuse. Without internal pipe routing, this building will never be able to incorporate reused water, and installing these specific interior pipes would be prohibitively expensive in the future and ultimately infeasible. Although this example may seem unrelated to landscape, we understand that the landscape is part of a cohesive and multi-functional campus system for utilities and sustainability. The landscapes designed for this building were meant to mitigate rainwater events, while supporting our utility infrastructure and meeting our iCAP goals. Instead of using water on site within the building interior, water will now be sourced from the local aquifer, impacting regional land use and resources.

With consistently more than \$500M in active capital projects ongoing at the Urbana campus in recent years, we recognize that the Capital Planning process will continue to be the primary method for implementing landscape improvements. However, when a project budget gets tight, without strategically allocating funds for landscape it will continue to be minimized at the expense of the overall campus environment. To put it simply, if it comes down to Building vs. Site, the Building wins every time.

To address this issue, the committee recommends defining a small percentage of all capital project budgets to be dedicated to the exterior landscape. For example, a goal of at least 4% of a project's budget could be specifically marked for the exterior landscape. A sliding scale could be implemented to account for projects of various sizes. With the recognized tangible and intangible benefits of a properly designed site, this budget number no longer represents pure aesthetics. Protecting project funding and mandating site innovation should be the standard. With this, incremental improvements can be made throughout campus on a project-by-project basis. We can no longer allow building projects to proceed without contributing to the overall vision for a sustainable campus environment.

Direct funding

In addition to the larger improvements that occur during Capital Projects, there is a small amount of funding in F&S Grounds for Repair and Renovation (R&R) projects. For the last

three years, this represents a mere \$100,000 annually. This limited funding is used for upgrading small exterior areas, and has been almost entirely devoted to safety improvements for sidewalks. In FY19, this funding replaced less than a quarter-mile linear segments of degraded or settled sidewalks at Henry Admin., Gregory Hall, Beckman Institute, Foellinger Auditorium, and on the Main Quad. It is not a large enough resource to address even a medium-size improvement, such as implementing the bikeway upgrade planned north of Bevier Hall and the Institute for Genomic Biology.

Outside of the R&R funds, Grounds looks for incremental improvement opportunities through their standard maintenance funds. For example, this is where the funding for new trees comes from. These funds are very limited and cannot address large-scale needs. One example of a large-scale need is the pavers all around campus. The pavers have settled and sunken down throughout campus. This settling often occurs next to a sidewalk, creating trip-hazards and potential fall areas. Additionally, the settling makes the campus look less maintained. Correcting this issue will cost hundreds of thousands of dollars. However, the operations and maintenance funds for Grounds are primarily used for required maintenance, so very few improvements can be funded this way. As a pedestrian society where walking is the main form of transportation, this need should be systematically addressed.



Very rarely, landscape improvements have been funded with a direct allocation from the campus. The recent improvements on several university-owned streets are the result of one-time allocations from campus. The recent \$40M funding allocation for addressing major deferred maintenance priorities could have addressed some of the needed exterior space improvements, but after going through the prioritization process all the funding was directed toward building improvements. Campus landscapes were again left out of any funding opportunities.

There are several landscape improvements needed for the Urbana campus (see Appendix B). These improvements are identified as high-profile needs that will make an immediate impact on the overall look and feel of the campus environment. The project at the top of this list is the promised landscape buffer along Curtis Road, between our Savoy neighbors and the planned Solar Farm 2.0. There are several more improvements that are needed after these priority locations are addressed, but currently there is no available funding source to implement stand-alone exterior improvements.

We reviewed the experiences from other Big Ten schools, and found that several of our peers allocate significant funding for landscape improvements. One example is Penn State.

Penn State

Penn State and our university are both members of the Midwest Landscape Architects and Grounds Managers Association, geared toward the Big Ten universities. When Penn State hosted the conference in 2017, their landscape architects described how they attended a previous conference in the early 2000's, and were struck by how beautiful the host university's campus was, compared to their own.

Their team of landscape architects returned to Penn State and prepared a plan to make a change. They began to assess different projects to update their campus landscape. Next, they formally requested university funding to begin making improvements. They requested an initial \$250,000, to which Penn State campus approved, and then doubled to





\$500,000. Projects were immediately designed and implemented to great campus favor. The next year, the request was for \$500,000, and their administrator again increased it to \$750,000. By the third year they were allocated \$1 million. With an investment from campus, and the resources to identify and design in-house projects, Penn State has been incrementally and consistently increasing their campus aesthetic over the last 2 decades. With four landscape architects, plus student employees, they are also able to identify and design other improvements that can be presented to campus units for funding. Of note, their grounds department has approximately fourteen working horticulturists who manage and maintain their own areas on campus. Through funding, creative design, and properly resourced management, their campus now stands in the top tier of campus landscape aesthetics. This is noticed by donors, prospective students, faculty, and visitors.

We recommend a direct line of annual funding for landscape improvements. This funding can support large-scale improvement projects, as well as smaller-scale efforts that are beyond the ability of F&S Grounds to fund. We recommend an allocation of \$1M per year, starting with \$500K in FY20, under the direction of the ULA.

Donor engagement

In general, there has been very little donor support for exterior landscapes on the Urbana campus. There are some small-scale improvements that were funded by donor support through the Donor Tree program or Endowed Landscapes. Historically the full cost of maintenance had not been correctly calculated, so there are a handful of endowed landscapes with insufficient funds to properly maintain the spaces. One notable example is the Chi Omega Plaza, which has been an endowed landscape since 2001.

Chi Omega Plaza

Chi Omega donors paid for the installation, but the leftover maintenance endowment allows for only \$235 annually. This amount is woefully inadequate, so the plaza maintenance did not meet the donors' expectations and caused friction between the community and F&S Grounds. There was also confusion on who was supposed to maintain the landscape. One committed volunteer has historically done some maintenance, but they did not agree with Grounds service levels and approaches. In the confusion, Grounds backed away thinking this area was supposed to be maintained by the volunteer. The donor, Chi Omega, stated they do not think the site looks good, so it was brought back to F&S for a resolution. The ULA has now redesigned the garden with long-term maintenance in mind. He has also assisted with alleviating confusion for all parties and making sure that there is a clear documented path forward.



This type of confusion and inadequate maintenance funding in the past has led to a reluctance in F&S to pursue more endowed landscapes. Recently, funding from donors has been increased through improved conversation and support from the ULA. After revising the Donor Tree and Endowed Landscapes policies and preparing clear implementation policies, F&S is better prepared to increase funding support for campus landscapes through donor funding. This comes with an upfront understanding that the maintenance funding will be appropriately calculated for the long-term caretaking of the endowed sites.

F&S is now requesting a Memorandum of Understanding (MOU) with each new endowed landscape effort. The MOU clearly states the expectations of each participating party, including ongoing financial support and end of project expectations. These documents are filed for future reference and use, with the F&S Facility Information Resources team. Use of the MOUs has also allowed increased support by student groups, outside volunteer entities, the UI Extension. Further synergies with student, faculty, and donors should be pursued using this model.

Although UI Foundation (UIF) involvement has not been high for landscape improvement projects, it is growing. A great example is the improvements at the Stock Pavilion. Originally the donor wanted to provide funds to fix the windows at the Stock Pavilion because they looked bad. As the relationship grew, the College of ACES has partnered with him to renovate the interior, renovate the south entrance, and add a potential new classroom space.



There are many opportunities like the Stock Pavilion that can be integrated in the UIF development efforts. A great example is the success story for improving donor support at Allerton Park and Conference Center. With some initial direct funding support from campus allocations, Allerton was able to make a few key improvements that attracted donors for further investments. Recently, a UIF gift account was set up to support implementation of the Campus Bike Plan. A similar account should be created to support the Landscapes Master Plan, and campus could seek assistance from UIF to prioritize donor support for this plan. Additionally, the ULA should work with the UIF to establish a closer relationship and collaborate to seek donor funds for prospective landscape projects and needs.

Utility fee for rainwater management

In 2012, both the City of Champaign¹⁶ and the City of Urbana¹⁷ adopted Stormwater Utility Fees to support their rainwater management infrastructure and encourage adoption of green infrastructure. As the City of Champaign’s website notes: “Like gas, electricity, water, and sewage, stormwater runoff can be managed as a utility and billed as a fee. The fee is based on the concept that every property in a watershed contributes stormwater runoff and should support the operation, maintenance, and rehabilitation of stormwater drainage systems in the City.” The campus should adopt a similar rainwater management utility fee on campus and use the fee to

16 <https://champaignil.gov/public-works/find-a-service/stormwater-management/>

17 <https://www.urbanaininois.us/sites/default/files/attachments/city-urbana-frequently-asked-questions-final-version.pdf>





support green infrastructure maintenance. Existing utility rates are approved by the Office of the Provost annually for the following utilities: steam, electric, chilled water, water, and sanitary.

Annually, F&S Utilities & Energy Services estimates the projected expenses for each utility, including operating costs, capital improvement costs, and debt service payments.¹⁸ The costs for supporting the existing storm sewer system are currently rolled into the sanitary utility rate, which is allocated to individual buildings, based on metered potable water consumption. This funding is extremely limited when it comes to capital improvements for the rainwater system. When a capital project will impact an area that needs a rainwater management improvement, there is once again a conflict between the building and the site. As described previously, the building maintains priority, and modern rainwater solutions that could be implemented through the capital project are often left undone.



There is an immediate need for a campus-wide rainwater management plan that identifies priority locations for green infrastructure, the associated capital costs, and the long-term maintenance costs. To fund the development and implementation of this plan, we recommend implementing a separate Rainwater Management utility rate starting in FY21.

Recommendations

Based on our review of existing and potential funding mechanisms, we recommend the following cost-effective funding solutions to realize the campus landscape vision.

Earmark capital project funding for landscapes

A small percentage of all capital project budgets (at least 4% of a project's budget) should be dedicated to the exterior landscape and site innovation. A sliding scale could be implemented to account for projects of various sizes. With this, incremental improvements can be made throughout campus on a project-by-project basis, and capital projects will contribute to the overall vision for a sustainable campus environment.

Provide direct annual funding for landscape improvements

We recommend a direct line of annual funding for landscape improvements to support large-scale improvement projects, as well as smaller scale efforts that are beyond the ability of F&S Grounds to fund. We recommend an allocation of \$1M per year, starting with \$500K in FY20.

¹⁸ For a full list of expenses included in utility rates, see <https://www.fs.illinois.edu/services/utilities-energy/business-operations/utility-rates>

Prioritize efforts to seek donor funding for campus landscapes

We recommend the Campus Landscapes department, in collaboration with the UI Foundation, prioritize efforts to increase donor funding for endowed campus landscapes. Agreements with donors should be clearly documented with a formal MOU, stating the expectations for each participating party, including ongoing financial support for landscape maintenance and end of project expectations.

Establish a Rainwater Management utility fee

We recommend implementing a separate Rainwater Management utility rate starting in FY21 to develop and subsequently support implementation of a comprehensive rainwater management plan.





CONCLUSION

Conclusion

We have an historic obligation to those who inhabited these lands before us and a future existential responsibility to those who will inhabit them after us to steward and maintain our valuable campus landscapes. The current systems for managing our landscape fall short of the ideals we espouse for a multitude of reasons. To live up to these ideals we need to develop a Landscape Master Plan with a shared vision for campus landscape that demonstrates the university's vision of itself, and we need to provide operating processes and funds to achieve the vision. In 1894, Andrew Draper noted, "The wealth of Illinois is in her soil and her strength lies in its intelligent development." This sentiment remains true today and as Illinois embarks on the next 150 years of excellence.

This report recommends the following strategies to realize a resilient campus landscape.

1. Develop a **Landscape Master Plan** that includes a shared vision for the overall campus landscape and specific design guidelines. This will involve:
 - a. Establishing a steering committee
 - b. Employing an external landscape architecture firm
 - c. Engaging with the public and stakeholders
2. Develop a **clear and consistent decision-making process**, consisting of
 - a. Establishing a Campus Landscapes department, headed by the University Landscape Architect, with authority over landscape design and with appropriate staff support.
 - b. Creating a landscape design appeals process, with representation from campus officials who are responsible and accountable for the resilient campus landscape.
 - c. Revising policies to support resilient landscape practices.
3. Promote **exemplary rainwater management practices** through
 - a. Increasing education and engagement, for grounds employees and Illinois communities, as well as, initiating a recurring student design competition, and funding the implementation of their designs.
 - b. Requiring Best Management Practices (BMPs) for rainwater management, in both core campus areas and agriculture lands.
 - c. Developing and then following a comprehensive rainwater management plan.





4. Provide **adequate resources for an effective Grounds Department** by
 - a. Increasing the F&S Grounds staffing complement, including additional Grounds Workers; reinstating the Grounds Gardener, Horticulturist, and Tree Assistant positions; and hiring an Ecologist.
 - b. Training the grounds employees, both at F&S and for all units with grounds staff.
 - c. Providing appropriate equipment and facilities, with updated equipment and planning for appropriate substation facilities.

5. **Fund landscape improvements** by
 - a. Earmarking capital project funding for landscapes
 - b. Providing a direct line of annual funding of \$1M for landscape improvements
 - c. Prioritizing efforts to seek donor funding for campus landscapes.
 - d. Establishing a Rainwater Management utility fee to support a comprehensive rainwater management plan.

Working together, these solutions provide a framework to ensure that our campus landscapes reflect the overall quality and mission of the university, providing ideal spaces for learning and growth for generations of students to come. These solutions must be coupled with opportunities to inform and educate university clients about the multifunctional aspects of campus landscapes. These aspects go beyond mere aesthetics, from marketing and advancement, to collaboration and interaction, to living labs and passive learning, and finally to sustainable practices and environmental benefits. Implementing these changes will promote a cultural shift within our units, amplifying other efforts to promote campus landscape health, beauty, and sustainability for the next 150 years.