



Symposium on Laboratory Lifecycle Management Executive Summary

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Summary of 2022 Lab Symposium Events

Introduction

The ability for any major research university to fulfill its research and teaching mission is intertwined with the usability of its laboratory facilities and related spaces. Modern facilities and proper facilities management enable departments to attract top-tier faculty and recruit top tier research students. The best scientific staff, facilities, and instrumentation allows researchers to effectively capitalize on emerging research opportunities and grant awards. While the researchers themselves are at the heart of our UW-Madison scientific enterprise, proper facilities management provides scientists the space to perform at their highest potential and for the university to remain competitive with our peers.

The university's capacity to fulfill its teaching and research mission is innately intertwined with the functionality and availability of laboratory facilities. The insufficient investment in facilities now impacts the ability of UW-Madison to recruit and support scientists and industry to develop high impact research outcomes. For UW-Madison to optimize its impact as a top-tier R1 public research institution, improve its ranking in research expenditures, recruit leading faculty, and deepen industry partnerships we must provide superior laboratory facilities in a timely fashion.

Sponsored by the Vice Chancellor for Finance and Administration, Office of the Provost, Dean of the School of Medicine and Public Health, and Vice Chancellor for Research and Graduate Education, the university hosted the Symposium on Laboratory Lifecycle Management in the fall of 2022. The Lab Symposium featured community leaders in research and development, higher education, and industry that sought answers to the question, "How can we accelerate innovation and research in Wisconsin by advancing laboratory facilities management and deepening collaboration between UW-Madison and industry partners?"

The Lab Symposium was held in-person on the UW-Madison campus with three events in November and December 2022. The events brought together an interdisciplinary collection of experts and practitioners to discuss long-term approaches to the management of our laboratory facilities and related assets, guided by the following questions:

- How do we maximize the impact of our research spaces and facilities?
- How do we position our research space for the future?
- How do we identify and develop operational and fiscal models that sustain long term growth?

We aimed to explore these questions through the following lenses:

- Consideration of the people and processes needed to support these facilities.
- Discussion of the finance and budget models for successful research infrastructure (in ways that address both cost and revenue).
- Dialogue around physical and operational models that combine design, construction, operations, and maintenance.

The Lab Symposium brought together almost 170 attendees over three days from the campus community – faculty, facilities experts, department leadership – and representatives from University Research Park and the Wisconsin Alumni Research Foundation; private architecture, design, and construction companies; leaders of life sciences companies and professional organizations; facilities experts from federal research and funding agencies; and representatives from peer institutions.

Each day featured panelists with a diverse array of experience from academia, industry, and federal research laboratories as well as design, real estate, and construction. Most speakers were from the broader Madison area, with some experts traveling in from other parts of the United States (see Appendix for full list of speakers). The high level of involvement from external organizations signaled the importance of this topic and its potential to further cooperation between industry and the university. The opportunity for collaboration between on-campus researchers, facilities experts,

and real estate professionals, with off-campus design and construction experts, industry scientists, and finance specialists, created a special environment that resulted in new knowledge and connections between experts.

The schedule for the three days follows:

Day 1: Readiness

Session 1: Current Landscape and Opportunities in Biotechnology and Biohealth

Wisconsin's biohealth industry is unique for its scope and breadth, encompassing global enterprises, a thriving start-up ecosystem, and a major research university. This session provided an overview of the biohealth community, the challenges faced and the potential opportunities.

Session 2: Aspects of Readiness to Meet the Challenges of Growth and Change

Physical space is key to developing science and technology responsive to critical events, meeting recruitment needs for leading faculty, post docs and graduate students, and thriving in the competitive environment of major research institutions. This panel included a discussion of strategies for management and improvement of facilities, and the instruments and equipment within them, to support a robust lab and research programs.

Session 3: Readiness Case Study

Representatives from the University of Washington School of Medicine and the National Development Council spoke about their experience using a private-public partnership model to design, finance, construct, maintain, and operate a new medical research facility.

Day 2: Operations and Renewal

Session 1: Opportunities in Lab Management, Operations, Design & Renewal

A successful and efficient lab facility operates at the nexus of strong planning, design, operations, and management. By incorporating voices from across the spectrum of lab facilities experts and users, this panel included individuals from across the spectrum of lab facility experts and users and discussed tools and strategies for successful lab operations and management, as well as innovative strategies for lab design and renewal.

Session 2: Case Study: Pivoting for COVID-19

The Covid-19 pandemic demonstrated rapid research mobilization, changes in technology, and unprecedented levels of cooperation amid constant evaluation and oversight. This panel investigated environments and strategies that fostered this fast-paced ability to respond to crisis. How did the experience affect attitudes and practice in design, development, maintenance operations and renewal – and prepare lab and organizations to be ready for the next event?

Day 3: Long-Term Planning Finance and Budget

Session 1: Managing and Maintaining Lab Operations for the Long-Term

This session focused on maintenance, operations, and renewal. In addressing the coming challenges to the research landscape, organizations must respond through facilities, people, and process. Discussion focused on best management practices in modeling facilities and processes for long-term planning in a field with rapidly changing needs that make it harder to anticipate possible future needs.

Session 2: Resourcing and Financing Laboratories for the Long Term: Facilities, People & Other Assets

Discussion focused on finding the appropriate talent and resources necessary to building these models. How do we authorize, predict, defend, manage, and use set-asides to fund recurring maintenance for the long-term care for our laboratories?

Key Themes from the Lab Symposium

The topics chosen for this section represent the main topics repeatedly brought forward throughout the Lab Symposium. These findings are key opportunities for development and growth on our campus, based on the unique challenges faced by UW faculty and staff in attendance at the event.

A. The maintenance, renewal, and efficient use of our existing facilities and assets are key to maximizing impact on a limited budget.

As our campus facilities age, routine maintenance, and modernization is essential to ensuring facilities remain effective for their users – yet much of the necessary capital renewal is deferred or remains uncompleted. Strategies for regular assessment and cataloging of aging facilities to determine effectiveness, redundancy, and maximization can ensure renewal projects will better serve current and future users.

B. Research core facilities are a significant asset and can be better leveraged to benefit UW, research, and industry.

Research cores include expensive, highly technical instruments, equipment, and techniques. Our current network of research cores serves as a resource to campus users and external research communities throughout the region, but there are opportunities for efficiency, awareness, or improvement. This includes the existing Office of Campus Research Cores working with campus cores to publicize capabilities for campus and industry-sponsored research, continued OVCERGE support of instrument acquisition and cost-sharing options, and evaluation of new operating and/or support models to enhance research cores' benefit to the research enterprise.

C. Adaptable and flexible laboratories are a priority to meet the unpredictable needs of the future of science.

Both the rapidly advancing pace of research techniques and practices and the growing need

to adapt campus lab spaces to accommodate new faculty and projects – the investment in adaptable and flexible laboratory spaces is a priority. These shifts require a different approach to designing and renewing spaces, and a culture change in the approach to requesting, assigning and sharing lab spaces on campus.

D. Current capital project delivery models, and procurement processes, severely constrain our ability to keep pace with our more autonomous peers.

Lab Symposium panelists from construction firms to peer institutions presented on alternative models for the delivery of capital building projects that could result in favorable outcomes of lowering total cost and shortened timelines, including Construction Manager at Risk, Design-Build, and Public-Private-Partnership.

E. Clear need for stronger partnerships between UW-Madison, government, industry, and economic development agencies to position the advantages of Dane County and Wisconsin as a high value location for health tech growth.

Madison is a local hub for industry advancement in the life sciences, anchored by the talented workforce trained at UW-Madison each year. This industry has become hugely important to the Wisconsin economy, such that the goals of the university often align with biohealth industry.

F. Researchers report a high administrative burden, limiting their ability to produce high-impact science and UW-Madison's ability to recruit and retain top talent.

Faculty and research teams are struggling with added administrative tasks related to grant management, procurement, hiring and other business services. Providing campus support to eliminate or minimize administrative burden, where possible, would allow faculty, graduate students, and staff to focus on research, teaching, and mentorship.

A. The maintenance, renewal, and efficient use of our existing facilities and assets are key to maximizing impact on a limited budget.

As our campus facilities age, routine maintenance is essential in ensuring those facilities remain effective for their users, yet much maintenance is deferred or otherwise remains uncompleted. Ideally, plans and budgeting for lifetime maintenance are made at the beginning of a project, but assessment of aging facilities to decide effectiveness, redundancy, and adaptability ensures that any renewal projects allow the facility to better serve its users.

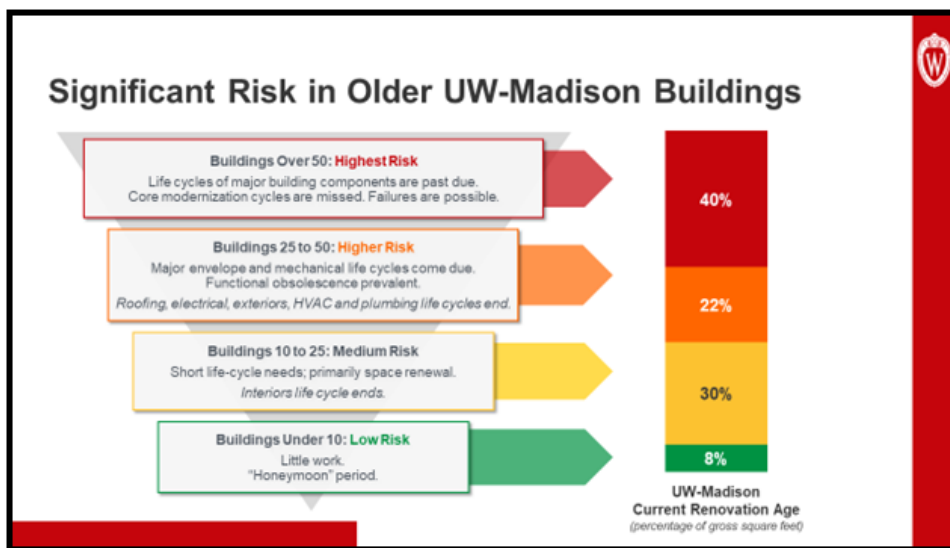
UW-Madison Associate Vice Chancellor for Facilities Planning & Management (FP&M) Cindy Torstveit shared UW's facility professionals' perspective. Our campus buildings are rapidly aging—83% of our buildings are over 25 years old and 79% are over 35 years old. This creates a situation that much of our portfolio is getting to the end of its useful life and is in need of full replacement of major mechanical, electrical, plumbing, fire protection and exterior envelope systems. We must have proactive facility plans for the lifetime maintenance of assets in order to reduce future costs as structures continue to deteriorate. This problem is not unique to our university. Representatives from other academic institutions and government laboratories reported the same problems with their ability to maintain their assets, despite maintenance and renewal being the preferred alternative to creating new facilities. A proactive attitude and plan are required for the lifecycle maintenance of assets to reduce future costs and advance our research enterprise in the long term.

routine maintenance, and building new facilities. The process of completing these projects must consider the nature of research and provide shorter and more predictable timelines to properly fund and deliver complex laboratory projects.

Maintenance and renewal must be prioritized as we look to maximize the use of our aging facilities that cannot be replaced in the near future. Campus buildings must be evaluated for space utilization, and assessed for the work required to make them usable to the modern researcher. Some facilities are at maximum capacity, limiting departments' ability to welcome new faculty or grow new research enterprises. Other facilities are so outdated groups find the buildings difficult use or incompatible with research infrastructure needs and even basic issues like ADA accessibility, and access to women's restrooms.

There is a very strong need for all campus buildings to be evaluated for space utilization. Followed by buildings identified as outdated or underutilized being assessed for the work required to make them useful to the modern scientist.

In addition, financing routine maintenance, renovation, and renewal must be prioritized. This includes addressing the deferred maintenance backlog. The State of Nebraska recently funded a strategic, long-term solution to the University of Nebraska's deferred maintenance problem, in which they committed to funding 40 years of deferred maintenance with an initial purchase of \$400 million of state bonds (Nebraska LB384, 2021). Their innovative approach allows for a long-term view of facilities maintenance and ensures that routine upkeep extends the life of their facilities.



Laboratory facility improvements include three target areas: renovation of existing facilities, completion of

Within industry, the best practice is to align the asset register – which includes space, systems, and

equipment – with the financial register so that the costs of maintenance, operation and renewal can be tracked and then predicted. The asset register also contains condition assessment and monitoring information to provide spending efficiencies through predictive maintenance and allows for budgets to be smoothed over time, eliminating capital spikes for emergency repair. Further, it must be clear where responsibility for routine maintenance “lives” for a building. Does the responsibility lie with the individual department? With FP&M/Physical Plant? With the school/college? While this must be clearly identified and funding provided to that group, “ownership” cannot be a reason for inaction. A former department chair emphasized the challenges departments face in financing and keeping up with routine maintenance. Departments, if found to be the party responsible for the maintenance of their facilities, must be allocated the necessary budget for their entire square footage.

The capacity to conduct regular, ongoing facility condition assessments and collect other asset-related data into a recognized framework, and then linking data to informed decision-making, is a key strategy for prioritizing projects. An assessment of existing facilities will catalog spaces that are still meeting the needs of users, spaces that are not, and what spaces require modifications to avoid replacement. An ongoing process of evaluation and surveys of asset operation over time helps in deciding the value of updating facilities for usability, resolving operations problems, improving sustainability, and ultimately extending the lifetime of a facility. However, the collection and management of this data requires significant capacity, which FP&M/Physical Plant currently does not have online at this time. Assignment of resources to Physical Plant to handle the historical tracking of building plans and maintenance ensures that campus is better able to plan for the lifetime of a facility and that fewer surprises emerge while work is done.

B. Research core facilities are a significant research asset, and can be better leveraged to benefit UW, research, and industry.

Our current network of research cores provides expensive, highly technical instruments, equipment, and techniques accessible to campus users - and serve as a resource to the external research community in the region. Symposium attendees discussed opportunities for Cores to better serve campus through increased publicity; more centralized administrative supports in financing, HR, and cost-sharing options; and evaluation of new operating and/or support models for core service delivery.

Scientific core facilities are specialized laboratories that provide shared, unique, highly technical, and high-cost services and instrumentation to users. These facilities are managed by skilled technicians and scientists, who train users, provide expert consultation and run specialized equipment and experiments. Core facilities are an integral part of a highly productive research campus as they reduce equipment and instrument redundancy between labs and departments and provide students with access to and experience with highly specialized equipment and research. At UW-Madison, our campus maintains 120+ core units, 500+ shared instruments and resources, and 450+ professional services through the Office of Campus Research Cores, an initiative of the Office of the Vice Chancellor for Research and Graduate Education (OVCRGE).

Research core facilities are important to the university research community and the broader region and Midwest research community. Although the priority of the Core is to serve the university community, these facilities are available to external users, sharing access to specialized instrumentation to the industrial life sciences research community. This also helps to fund the core facility, as industry user fees, which are slightly higher, subsidize core operating costs. Lab Symposium attendees reported that availability of core facilities should be better publicized to our campus to increase core usage and ensure their financial success.

Symposium attendees discussed how opportunities to further collaborate, consolidate, and/or provide shared services among Core Labs may be an approach to increase efficiency, reduce cost or support access to these valuable resources. In addition, continued efforts like the [Research Core Revitalization Program](#) and other instrument acquisition strategic initiatives in the Office of the Vice Chancellor for Research and Graduate Education (OVCGRE) are valuable to advance research.

Viewing research cores through the lens of potential effective public-private partnerships is an interesting opportunity to work productively with industry leaders. Core facilities that operate through this partnership model have been in place in many biomedical hubs, such as Boston, Chicago and Seattle for a decade or more. These examples provide a potential model for the Madison area, which could implement strategies to increase Cores availability to industry and developing partnerships that support the improvement of campus facilities. Conducting short-, medium-, and long-term surveys of need along with current and in-process capabilities and costs and then designing a business model for development is one way to move forward.

C. Adaptable and flexible laboratory spaces are a priority to meet the unpredictable needs of the future of science.

Both the rapidly advancing pace of research techniques and practices and the growing need to adapt campus lab spaces to accommodate new faculty and projects – the investment in adaptable and flexible laboratory spaces is a priority. These shifts require a different approach to designing and renewing spaces, and a culture change in the approach to assigning and sharing lab spaces on campus.

Long-term forecasting for laboratory needs is a challenge as we do not know where future science is headed. Science advances and techniques change extraordinarily fast, making it hard to predict what scientists will require in their laboratory facilities 10 to 20 years in the future. During design and construction, the requirements of the end user regarding space may be different than the initial design. Due to the extremely specific requirements of operating specialized instruments, working with chemicals, supporting living plant and animal specimens, laboratories often need to be retrofitted for the specific researcher using the space. Lab Symposium attendees discussed qualities of a laboratory design to minimize retrofitting requirements and maximize utility of research spaces into the future.

To enable a space to be retrofitted to its end user, initial design should be both flexible, or able to be changed quickly, and adaptive, or able to accommodate large less predictable changes. Best practice is for the initial design to predict 80 percent of the needs of the end user, with enough adaptability in the space to accommodate for the other 20 percent. Being mindful of flexibility in space and more granular levels of control in services is a partial answer to the problem of needing to accommodate unpredictable space requirements, but it is expensive and requires significant input and imagination during the design requirements phase. It may also lead to some spaces that are “over-designed,” but may be offset long-term by reducing retrofit costs. One solution to this issue is more open and customizable spaces with shared services, which may require a culture change away from the perception of lab and offices spaces “permanently” assigned to faculty for a single use.

Depending on the work taking place and instrumentation utilized in a laboratory, users have diverse and specific needs from their space. For example, chemists require high air turnover via a sophisticated HVAC system to allow for safe use of volatile chemicals, or physicists may require their space to be maintained at a very specific

temperature and humidity for a delicate instrument to operate reliably. To add to the challenge, different rooms may have different needs; for example, offices in a chemistry building do not need the same air handling as the laboratories. Space needs will change over time, and our facilities should be able to accommodate the very specific needs of the scientists who work in them.

In addition to a traditional wet lab and bench laboratory space, scientists also require appropriately outfitted lab spaces for computational analysis or clinical research. In addition, faculty, graduate researchers, and post-doctoral scholars require “out of lab” work and collaboration spaces to prep for courses, write and review research articles, apply for funding, etc.

To add to the complexity, graduate programs are larger than they used to be, and older buildings are struggling to accommodate the larger numbers of student office spaces that are required. Creative solutions will be required to fit group office spaces such that departments can continue effectively training large numbers of graduate students.

One thread carried through the Lab Symposium was the continued trend toward “team science” – the collaborative nature of today’s effort to address specific scientific challenges – and emphasizing the need for spaces that encourage collaboration. This includes appropriate shared space, conference room space, and increased technology for virtual team meetings to facilitate cross-campus and cross-institutional collaboration.

The modification of an existing laboratory to meet the needs of a new researcher can be a lengthy process, up to 2+ years in some cases. The Laboratory Delivery Team at FP&M is working to address the issue as an area needing improvement on our campus. The long timeline to create space for new faculty members was highlighted at the Lab Symposium as the leading reason for tenure-track clock extension requests. When a new researcher is hired to join the faculty, they either establish a new research group or move their existing students to Madison, and need spaces that are designed with adaptable and flexible lab spaces that may allow for a more efficient turnover time. New researchers on campus need to be able to pursue their research goals quickly, apply for grants, satisfy tenure track review boards, and keep their students on track to graduate. There are various strategies to reduce this time, both administrative (notifying FP&M more quickly about needs of new faculty) and operational (increasing flexible lab facilities, evaluating risk vs. reward in starting lab renovations sooner, etc.)

While science is moving rapidly, there are some fields we know will continue to be funded to meet society’s needs, and will continue to require appropriate lab

spaces to be able to capitalize on funding opportunities. One of these types of spaces are Bio Safety Level 3 lab spaces. These are laboratories that allow for the study of infectious agents or toxins that may be transmitted through the air and cause potentially lethal infections. Proven by the COVID-19 pandemic, the scientific community was underprepared to study airborne disease, and the pandemic has made the study of airborne pathogens a priority for funding. Another type of facility our campus is under-supporting is vivarium space, animal research facilities critical for conducting research in many areas of study. These facilities have very specific requirements that are monitored by the USDA and are very difficult to design and maintain.

Lab Symposium attendees also expressed the desire for flexible, temporary laboratory spaces that could meet many of the needs discussed above. A large, shared flexible laboratory space could serve as a landing zone for new faculty whose labs are being constructed. They have a place to conduct basic research while their permanent lab spaces are built out. These flex spaces could also serve as academic/industry co-working space, interdisciplinary workspace centered around a specific goal, or a place for academics to “rent” to develop their new startup company. These flexible spaces to “play in the sandbox” are common at other institutions, and industry partners are often involved in the creation of these facilities, as industries are often looking for ways to interact more closely with university researchers. Campus leadership should determine the feasibility of these facilities on our campus, and if this is a priority given space restraints. If so, initiation of a pilot could be supported by campus partners like Wisconsin Alumni Research Foundation or University Research Park and monitored and evaluated for clear deliverables.

D. Current capital project delivery models and procurement processes severely constrain our ability to keep pace with our peers with more operational autonomy.

Symposium panelists from construction firms and a peer institution presented on alternative models for the delivery of capital building projects that could result in favorable outcomes of lowering total cost and shortened timelines, including Construction Manager at Risk, Design-Build, and Public-Private-Partnership.

As our research enterprise aims to be on the cutting edge, showing up rapidly for state and national needs, facilities play a vital role in enabling science in a crisis. Our laboratories must remain sufficiently nimble

to meet emerging needs, and quickly. The current processes for delivering new facilities or retrofitting existing laboratories is not compatible with these goals as creating new buildings may take five to 20 years and a laboratory remodel may take up to two years.

The University and the State approach capital project delivery with the same core motivations—as responsible stewards of taxpayer money. The shared goal is to fund and build projects that serve the people of Wisconsin and delivered in a timely, budget-conscious manner. However current models for doing so can be slow, cumbersome, expensive, and limit the ability to be nimble to capitalize on opportunities or respond to crisis. The Lab Symposium addressed methods for improving capital project delivery processes that could result in less expensive projects delivered on a more predictable schedule with reduced redesign need.

Current state projects are usually delivered through a Design-Bid-Build model that focuses on controlling the initial cost of design and construction through a bidding process that focuses less on overall cost of building ownership. This ownership cost includes the possibility of extending the construction timeline due to redesign requirements. Additionally, the separation of design and construction and late collaboration between architecture teams and contractors leads to a more fragmented project team, resulting in longer timelines and possible redesign. More modern, collaborative models such as Construction Manager at Risk or Design-Build bring together stakeholders early in the process, improve communication, and focusing on overall cost at the beginning of the project, resulting in more favorable outcomes.

The University of Washington School of Medicine found success using another alternative delivery model, the Public-Private Partnership (P3). The P3 finance and delivery mechanism is a long-term agreement between a government entity and the private sector to share the risks and rewards of delivering an essential public service. The University of Washington School of Medicine entered a P3 agreement to build a new medical research and clinical facility in Seattle’s South Lake Union neighborhood. The University of Washington representative that oversaw the project felt that using the P3 model allowed for greater autonomy in the design and construction phase and greater control and flexibility in lifetime operations and maintenance. Moreover, the lower overall cost and shorter timeline of the project compared to a similar campus project using a traditional delivery method, made this nontraditional approach a success.

E. Clear need for stronger partnership between UW-Madison, government, industry, and economic development agencies to position the advantages of Dane County and Wisconsin as a high value location for health tech growth.

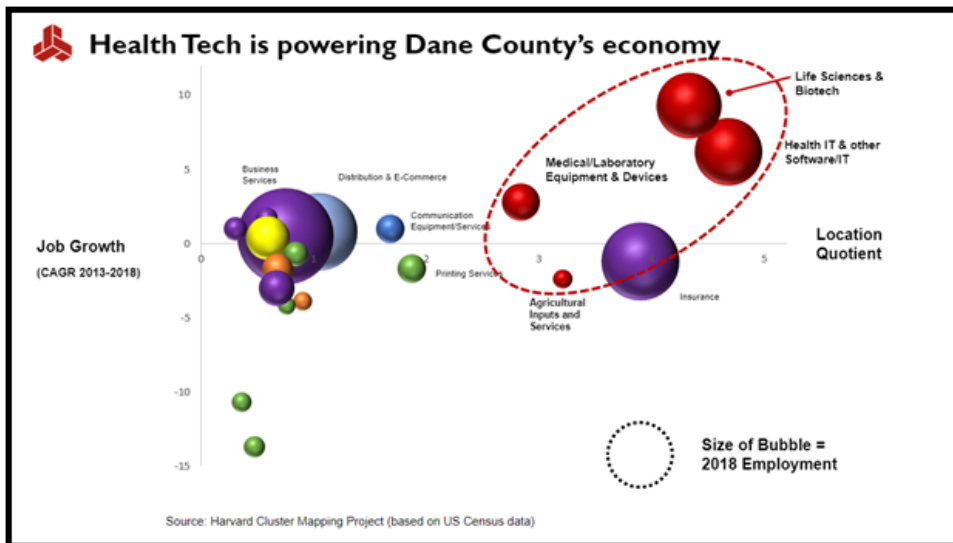
Madison is a local hub for industry advancement in the life sciences, anchored by the talented workforce trained at UW-Madison each year. This industry has become hugely important to the Wisconsin economy, such that the goals of the university often align with biohealth industry. We believe in this way, what is good for the University, is good for the biohealth industry, is good for Wisconsin.

The Lab Symposium began with dialogue about the role of the university in establishing Madison as a well-known hub for biotechnology and health research. A variety of metrics and reports, along with anecdotal information shared by the panelists from diverse organizations, focused the conversation in the success of the region in biotech and health research, and different avenues to promote the strength of the biohealth community to a broader national audience.

markets also discussed. Attention was drawn to areas experiencing high levels of growth as a life sciences cluster and CBRE stated the “most favorable markets demonstrate both high absolute numbers of talent and strong concentration of life sciences” employees. Despite performing well using their metrics, Madison was not included in their report. This illustrates both the opportunities that exist and the need to expand the reach of our capacity, success, and abilities.

- Madison deserves a spot on the map. Despite the smaller size of our population, Madison displays a degree of specialization in life sciences research rivaled only by the top markets in the country. In turn, the university and industry should focus on opportunities to collaboratively market and share the growth, innovation, and resources in our area.

In fact, Lab Symposium attendees called for collaboration to raise awareness of our specialty biohealth market and the opportunities housed here. Representatives of pharmaceutical and health sciences industries cited both our region’s high density of biological and biomedical, physical, and health sciences graduates from UW-Madison, and the advantages our of low cost of living, real estate, and business as reasons to promote and establish offices in Madison.



UW-Madison Lab Symposium:
The Madison Market; University
Research Park, Inc.; Aaron
Olver, Managing Director

One example of discussed was the U.S. Life Sciences Research Talent from Global Commerce Real Estate Services (CBRE) highlighting the top life sciences markets in the country. The locations were ranked using several metrics including total number and density of life sciences employees, growth in the number of life sciences workers, and number of PhDs produced in the biological and biomedical sciences (CBRE Research, 2022). As expected, the east (Boston/Cambridge) and west (San Francisco Bay) coasts were anchored clusters of life science research with emerging

BioFORWARD, representing the Wisconsin biotechnology, pharmaceutical, and health sciences industries, discussed the high economic impact of the Wisconsin life sciences sector and their role in better advocating for the advantages to doing business here in Madison.

- Madison is home to 3,900 life sciences employees, representing 1.03% of the Madison labor force (on par with competitive peers).
- From 2015–2020, Madison saw a 69% growth rate
- UW-Madison granted 7.21% of the total doctoral

degrees in biological and biomedical sciences. Regionally, only the New York/New Jersey and Boston/Cambridge markets surpass this rate. (National Center for Education Statistics, U.S. Department of Education, Integrated Postsecondary Education Data System).

Lab Symposium attendees echoed a desire for the university to work more collaboratively with the Wisconsin biohealth community. Panelists saw potential to strengthen trust and cooperation between the university and industry leaders to support common goals. Panelists advocated for promoting the university as the foundation for the life sciences industry that contributes \$32 billion to the Wisconsin economy and employs Wisconsinites with salaries above the state average and with a high job multiplier effect (TEconomy Partners, LLC., 2022). Supporting the needs of the university and life sciences industries has a positive impact on the broader Wisconsin community.

There is also a need for joint university and industry research spaces to improve the ability of the university to build better industrial relationships. This joint space could include flexible “swing space” for university users, entrepreneurial spaces for university-created startups, corporate innovation centers, and incubator facilities to foster economic growth and educational opportunities.

F. Researchers report a high administrative burden, limiting their ability to produce high-impact science and our ability to recruit and retain top talent.

Faculty, research teams, and research administrators are struggling to keep up with increasingly high levels of administrative burden, especially in the management of grant awards. Providing campus support to lift or streamline administrative labor, where accessible, from departments and individual faculty or researchers would allow additional time for research, teaching, and mentorship.

Often overlooked in long-term laboratory asset management is the well-being and development of our faculty, graduate students, post-doctoral scholars, and scientific and administrative staff who are the drivers of campus research and innovation. This includes skills training and professional development, but also establishing an environment that maximizes research capabilities.

Faculty attending the Lab Symposium compared operating a highly productive research laboratory

to running a small business in a high pressure, highly regulated environment including, planning, budgeting, facilities, procurement, and staffing. In this context, many named the related administrative burden as limiting their ability to focus on conducting research.

A recent Administrative Quality Satisfaction Survey administered by the Office of the Vice Chancellor of Finance and Administration validates anecdotal concerns of faculty burden due to administrative tasks, and a feeling of insufficient support from the business and research administration on campus. The overwhelming perception was the lack of support in administrative tasks from colleges or central campus, leaving department staff and faculty scrambling to keep up with the tasks and systems required of them in order to keep their labs operational. Specifically, attendees and panelists called attention to three specific business processes that they need assistance with:

- Pre- and post-grant award management, administration and accounting
- Changing and cumbersome purchasing systems and regulations
- Recruitment delays

Ultimately, faculty, research teams, and students are burdened by administrative tasks that prevent them from focusing on research. Inspired by the idea of the many-user scientific core facilities that allow for cost and equipment sharing, one avenue to help with pre/post-award support, the leading area where faculty felt overburdened, could be establishing a Grant Support “Core”. This would give access to award support to smaller departments without existing designated support staff, as well as to larger departments who have overstretched general support staff.

While post-award support is much more limited than pre-award support, faculty report a lack of effective services to find funding opportunities, plan grants and budgets, and conduct required reporting that is significant enough to prevent them from writing grants entirely. Designated grant experts could support the complexities of post-award support that involve budgeting and the need for research-specific financial tools. This would involve collaboration between Research Administration and Finance, as many of the complexities of post-award support involve budgeting and the need for research-specific financial tools.

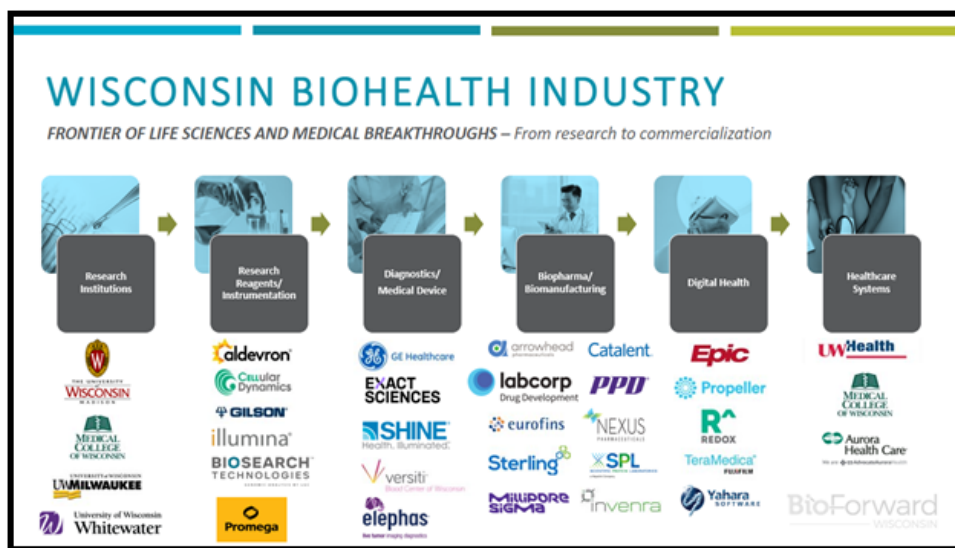
Reducing faculty and research team burden creates more time for scientific activities and increased productivity on administrative activities. The likely leading indicators of overall success would include increases in faculty and student retention rates, increased satisfaction scores for current faculty, more productive and streamlined recruiting of faculty,

graduate students and post-doctoral scholars, and an easing of burden up the ladder through Department Chairs and Associate Deans.

The Role of Partnerships

Madison is an advantageous mix of industry, academic, non-profit, and government interactions that, in this context, contribute to scientific advancement and positions Madison as a city of emerging specialization in the life science research field. As an outcome, The Lab Symposium served as a renewed call for the university to identify and cultivate partnerships that could create pilot programs addressing the needs outlined in this report.

In addition, the culture of our university, The Wisconsin Idea, can better serve as a selling point to bring partners in. As one panelist said, “We are a campus with lots of buildings with very few walls”, meaning that this is a collaborative place. Faculty and students often work across departments, share facilities and equipment in crises, and interdisciplinary team science thrives here. These are all selling points that make Madison an attractive place to do science and create a more diverse culture.



Discover BioForward and the Wisconsin Biohealth Industry, The Frontier of Life Science and Medical Breakthroughs BioForward Wisconsin

As we seek to better leverage the network of industry partners in the Madison area, the university must also look to be a better partner to these groups. Improvements to the contracting process, availability of space, and protections of intellectual property are already underway to ensure that partnerships are beneficial to both university and industry and that they can be approved in a timely manner. Looking at the UW-Madison campus, the School of Medicine and Public Health demonstrates one example in cultivating industry partnerships; their recent work in implementing new quality systems and standards in the clinical research domain has already resulted in an increase of clinical trials.

Collectively, through university, industry and government partnerships, it is valuable to better promote the advantages to living in Madison and Dane County—walkability and high quality of life with lower cost of living compared to larger cities and the coasts.

Recommendations

After conducting the Lab Symposium events and synthesizing the key themes, the following recommendations are provided as strategies to advance research and lab lifecycle management at UW-Madison. These suggestions range from topics to explore further at future learning events to targeted, action-oriented proposals for change.

1. Improve Stewardship of Existing Assets

- a. Plan for and fund lifetime facilities maintenance, and work closely with departments to decide ownership/funding sources. Funding should be secured from the beginning of a facilities project to ensure that routine maintenance can be completed during the 50-year lifetime of a building.

- b. Investigate strategies to reduce unnecessary equipment, instrument, and office/lab space redundancy and improve space allocation to maximize utility of existing facilities.
- c. Campus must be evaluated regarding space utilization and buildings identified as either outdated or underutilized, need to be assessed for the work required to make them useful to the modern scientist.
- d. Ensure that all campus research space is actively used by researchers for research purposes.
 - i. Investigate options by Office of Human Resources and schools, colleges, and divisions for clarifying office space and laboratory allocations in offer letters to ensure that indefinite laboratory space access is not guaranteed.
 - ii. Increase investment in the FP&M Lab Delivery Team to speed up the delivery of new laboratories for researchers.
 - iii. Invest in flexible and adaptable spaces, including the feasibility of multi-user flex laboratories for industry partnerships, new faculty use, or for providing space for campus-wide needs such as vivaria.
 - iv. Work with OVCRGE Office of Campus Research Cores umbrella to better publicize their resources to internal and external users.
 - v. Continue the OVCRGE [Research Core Revitalization](#) funding opportunity.

2. Strengthen Relationships with Industry and Government

- a. Leverage partnerships with established industry partners and startups in the biohealth community. Work with local and state government towards strategies to advance new research labs, tax benefits, real estate acquisitions, university system funding in the interest of all.
- b. Investigate and promote creative and appropriate delivery models for capital projects, depending on the type of project. This could include public-private partnerships allowing for lower overall costs, shorter and more predictable timelines throughout process.
- c. Support investment in the Wisconsin Department of Administration, Division

of Facilities Development to address long timelines for capital projects and fund the capital renewal backlog

- i. University Relations already advocates in the state budget request for efforts to improve the cost and timeline of state funded projects through additional investment for the Department of Administration, along with the ability of campus to issue bonds for select university-funded projects and increase the overall investment in campus infrastructure.
- d. Establish a community of practice composed of laboratory facilities professionals to continue the dialogue started in the Symposium to address issues raised in this report.

3. Improve Campus Systems and Culture

- a. Address and ease the administrative burden experienced by faculty, research teams, and graduate student through more efficient practices to support the pre/post-grant award management, recruitment processes, and purchasing systems. Invest in people as a resource and provide streamlined administrative support to allow scientists capacity to focus on research goals. Although this is a cross-campus issue that extends beyond the research experience, it's important to note that improvements in this area can support the campus in reducing barriers to conducting and sharing world-class research.
 - i. A potential solution could be centralization of administrative support. An "Award Support Hub" could better help faculty in identifying and applying for fundings, as well as the financial logistics of post-award support.
- b. Promote space sharing and research administrative support between schools and colleges, based on the Research Core Labs approach
- c. Increase transparency and communication between researchers, administrators, and campus leadership about how campus data are used and decisions are made on resource allocation and overhead costs.

Post Symposium Actions & Next Steps

Vice Chancellor of Research and Graduate Education (VCRGE) and the research and infrastructure aspirations of Chancellor Mnookin.

Consider the potential topics for future in-person or virtual symposia.

The Lab Symposium confirmed the interest and need for continued dialog and learning on campus and with external partners to advance these topics. Future strategies and projects include in-person or virtual symposia events in partnership with campus, industry and federal research and funding partners. In addition, other shared learning and networking opportunities like a community of practice for professionals in this space is under consideration.

The following topics were identified as a priority in the project charter, but not addressed in detail during the Lab Symposium event. These are suggestions for additional areas of continued dialog and learning to pursue in this space:

- Safety, security, space control, and clean air are rapidly expanding requirements for laboratory facilities.
- Procurement of laboratory supplies and equipment, including group buys of supplies and equipment, vendor partnerships, and tighter monitoring and negotiation of service contracts.
- Training and support of Principle Investigators, research teams, and administrators
- Investigating equitable approaches to lab funding and access that ensure schools, colleges, and departments with less financial weight maintain research access key to maximizing innovation.

Align next steps to campus strategic plans and aspirations

The goal of developing our infrastructure is to optimize UW–Madison’s investments in physical and technology system assets to support our growth objectives, while also ensuring strong delivery of facility, infrastructure, and financial system imperatives. Our laboratory facilities have a critical role to play in each of these priorities. A next step in this project is to socialize, revise, and advance the learnings and recommendations of the Lab Symposium to best support the strategic plans of Finance and Administration, Facilities Planning & Maintenance (FP&M), the strategic initiatives of the

Appendices

Key Resources and References

1. National Center for Science and Engineering Statistics (NCSES). 2022. Higher Education Research and Development: Fiscal Year 2021. NSF 23-304. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf23304/>.
2. CBRE Research. 2022. Life Sciences Research Talent 2022: The Search to Sustain an Industry Boom. Available at <https://www.cbre.com/insights/reports/us-life-sciences-talent-2022>
3. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment and Wage Statistics, Available at www.bls.gov/oes/
4. National Center for Education Statistics, U.S. Department of Education, COLLEGE Navigator, Available at <https://nces.ed.gov/collegenavigator/?q=University+of+Wisconsin-Madison&s=all&id=240444>.
5. TEconomy Partners, LLC. 2022. Wisconsin Biohealth: Industry Landscape and Economic Impact Report. BioForward Wisconsin. Available at <https://www.bioforward.org/wp-content/uploads/2022/10/TEconomy-Wisconsin-BioForward-Report-webready.pdf>.
6. Hockberger P, Weiss J, Rosen A, Ott A. (2018) Building a Sustainable Portfolio of Core Facilities: a Case Study. Journal of Biomolecular Techniques: JBT, 29(3):79-92. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6078059/>
7. Jeffs, A. 2021. Unlocking the value of data and workflow automation in the lab. PharmaIQ. Available here <https://www.pharma-iq.com/pre-clinical-discovery-and-development/reports/unlocking-the-value-of-data-and-workflow-automation-in-the-lab>.
8. National Academies of Sciences, Engineering, and Medicine. 2019. Managing the NIH Bethesda Campus Capital Assets for Success in a Highly Competitive Global Biomedical Research Environment. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25483>.
9. (2021) Legislature approves budget, university's deferred maintenance proposal. Nebraska Today. <https://news.unl.edu/newsrooms/today/article/legislature-approves-budget-university-s-deferred-maintenance-proposal/>.
10. Provide for and change provisions related to transfers of funds and funding for university and state college facilities, create and change permitted uses of funds, and create a grant program, LB384 (2021). <https://nebraskalegislature.gov/FloorDocs/107/PDF/Intro/LB384.pdf>.
11. Office of Campus Research Cores. Working Group on Scientific Core Resources Report and Recommendations. <https://research.wisc.edu/wp-content/uploads/sites/2/2016/12/working-group-on-cores-executive-summary.pdf>.
12. Meder, D., Morales, M., Pepperkok, R., Schlapbach, R., Tiran, A. and Van Minnebruggen, G. (2016), Institutional core facilities: prerequisite for breakthroughs in the life sciences. EMBO rep, 17: 1088-1093. <https://www.embopress.org/doi/epdf/10.15252/embr.201642857>.
13. Ibrahim, M. A.M. ASCE; Hanna, A., F. ASCE; Kievet, D. (2020) Quantitative Comparison of Project Performance between Project Delivery Systems. Journal of Management in Engineering: ASCE, 36(6): 04020082.
14. Labib, Y., Lotfallah, W., Hanna, A., Asce, F., Boulos, N. (2021) Development and Application of Performance Index for Comparative Assessment of Public Capital Projects. Journal of Construction Engineering and Management: ASCE, 147(2): 04020175.

Wisconsin Laboratory Lifecycle Symposium Program Committee

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Paul Seitz (Co-Chair)	Director, Strategic Initiatives	UW-Madison
Rich Halberg	Senior Director, SMPH Research Cores	UW-Madison
Mark Wells	Associate Dean for Facilities, SMPH	UW-Madison
Jon Audhya	Senior Associate Dean for Basic Science, Biotechnology and Graduate Studies	UW-Madison
Ed Borbely	Associate Dean, School of Engineering, UW - Madison	UW-Madison
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Kathy Collins	MadREP	External
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Aaron Williams	Interim Director, Campus Planning & Landscape Architecture, FP&M	UW-Madison
Brent Lloyd	Real Estate Development Director, FP&M	UW-Madison

Symposium Panel Participants and Slides

Day 1: Readiness

1. Current Landscape and Opportunities in Biotechnology and Biohealth

Anjon Audhya, Professor, Senior Associate Dean for Basic Research, Biotechnology, and Graduate Studies, School of Medicine and Public Health

Jessica Martin Eckerly, CEO and Co-Founder, Forward BIOLABS

Jason Fields, President and CEO, Madison Region Economic Partnership

Aaron Olver, Managing Director, University Research Park

Facilitated by Chris Kozina, University of Wisconsin–Madison, University Relations

Summary: Wisconsin's biohealth industry is unique for its scope and breadth, encompassing global enterprises, a thriving start-up ecosystem, and a major research university. This session will provide a view of the community, the challenges and the opportunities that meet the campus and community partners who seek to compete with larger biohealth communities in Boston, Seattle, San Francisco, Research Triangle Park North Carolina, and Minneapolis.

Panel discussions included:

- Overview of the current size, scope, and growth opportunities nationally and locally for the biohealth industry, including revenue, employment, space, and facilities
- Summary of the industry's areas of research and development
- Discussion of current and future opportunities for growth and the associated needs
- Big picture strategies for growing and recruiting the biotech industry
- Building collaborative relationships between campus, state, industry, and other partners.

2. Aspects of Readiness to Meet the Challenges of Growth and Change

Ramin Zandpour, Deputy Director/Electrical Engineer, Division of Facilities Stewardship, NIH

Robert Teigen, Vice President of IP & Associate General Counsel, Arrowhead Pharmaceuticals, Inc.

Paul Muench, Associate Director, University Research Park

John Huggett, Vice President–Central Operations, The Boldt Company

Jason Pinnow, Director of Research Facilities, Biomedical Research Model Services, School of Medicine and Public Health

Facilitated by Kurt Zimmerman, University of Wisconsin–Madison, School of Medicine and Public Health

Summary: Physical space is key to developing science and technology responsive to critical events, meeting recruitment needs for leading faculty, post docs and graduate students, and thriving in the competitive environment of major research institutions. This panel will include lightning talks and a discussion of strategies for management and improvement of facilities, and the instruments and equipment within them, to support a robust lab and research programs. Our preparedness for new opportunity makes this an exciting place to be.

Lightning talks and panel discussions included:

- Strategies to build readiness in facilities, equipment, processes, and people ready?
- Establishing an understanding of change in the industry and - where, how, and the speed at which change is occurring
- Models of readiness including: practices, metrics, and benchmarking
- Leadership to create a culture of readiness

3. Readiness Case Study

Mike Stanislaus, Director of Facilities, University of Washington School of Medicine

Paula Li, Asset Manager, National Development Council

Summary: Representatives from the University of Washington School of Medicine and the National Development Council speak to their experiences building a new medical research and clinical facility using a Public-Private Partnership delivery model. This session summarizes a real-world case study of organizational and project readiness and lessons learned, when faced with major opportunities or issues.

Day 2: Operations and Renewal

1. *Opportunities in Lab Management, Operations, Design & Renewal*

Randi J. Smith, AIA, Research Laboratory Architect/Engineer Manager, Facilities Planning & Management, University of Wisconsin-Madison

Rich Halberg, Professor of Medicine, School of Medicine and Public Health, University of Wisconsin-Madison

Jody Peter, Director of Research Services, Biomedical Research Model Services, University of Wisconsin-Madison

Jason Atkisson, PE, Principal, Affiliated Engineers, Inc.

Judith Burstyn, Professor, Department of Chemistry, University of Wisconsin-Madison

Facilitated by **Craig Weisensel**, Director, Strategic Project Delivery, University of Wisconsin-Madison

Summary: A successful and efficient lab facility operates at the nexus of strong planning, design, operations, and management. In the rapidly evolving landscape of biotech research and technology, it's becoming more important, and more challenging, to design and operate labs to be flexible, cost effective, and able to meet short- and long-term research needs. Incorporating voices from across the spectrum of lab facilities experts and users, this panel will discuss both the and tools and strategies for successful lab operations and management and innovative strategies for lab design and renewal.

Discussion topics included:

- Cases for process automation, standardization, staffing, and other supports for lab management
- Models for outsourced and insourced service and support, including contracts and purchasing
- Strategies to transition lab spaces from unique operations to commodity processes
- Role of Core Labs and shared facilities and services
- Understanding the changing nature of science and anticipating future needs
- Considering the need for spaces beyond the typical wet lab
- Connecting labs to each other and to sponsors – strategies for remote and co-location
- Meeting the challenges of renewing existing space including assessment, planning, design, and budgeting
- Maintaining current and accurate data regarding the portfolio of spaces being managed by an institution, and the sub-units within that institution.

2. *Case Study: Pivoting for COVID-19*

Keith Poulsen, Director, Wisconsin Veterinary Diagnostic Lab

Shelby O'Connor, Professor, Department of Pathology and Laboratory Medicine, UW-Madison

David O'Connor, Professor, UW Medical Foundation, UW-Madison

Dr. Jennifer Laffin, Clinical Laboratory Medical Director, Exact Sciences Laboratories

Mike Wagner, Investment Director, WARF

Facilitated by **Mark Wells**, Assistant Dean for Facilities, SMPH, UW-Madison

Summary: Covid saw rapid mobilization, changes in technology, unprecedented levels of cooperation amid constant evaluation and oversight. This panel will investigate what happened to facilitate success: how did the experience affect attitudes and practice in design, development, maintenance operations and renewal – and prepare lab and organizations to be ready for the next event?

Day 3: Long-Term Planning, Finance and Budget

1. *Managing and Maintaining Lab Operations for the Long Term*

Rich Halberg, Professor of Medicine, School of Medicine and Public Health, University of Wisconsin-Madison

Jim Bogan, CEFP, Interim Director, Physical Plant, University of Wisconsin-Madison

Jason Atkisson, PE, Principal, Affiliated Engineers, Inc.

Scott Morris, Principal Engineer, Sanofi

Rory Holland, Facilities and Laboratory Project Manager, University Research Park

Facilitated by Aaron Olver, Managing Director, University Research Park

Summary: This session will discuss the challenges to the research landscape in the next 5, 10, even 20 years, and how organization leadership can predictively create facilities to meet the future needs of researchers and extend the lifetime of the facility. This session will discuss the evaluation of existing facilities and how to address their needs as they age.

Panel discussion included:

- Developing and maintaining the asset register as a base for prediction
- Modeling facilities and processes inside them for the long term
- Establishing KPIs to support organizational growth
- Understanding leading and lagging indicators, along with benchmarking best practices

2. *Resourcing and Financing Laboratories for the Long Term: Facilities, People, and Other Assets*

Mike Wagner, Investment Director, Wisconsin Alumni Research Foundation

Gareth Lifton, Managing Director, KPMG

David Murphy, Associate Vice Chancellor for Finance, University of Wisconsin-Madison

Tim Donohue, Director, Wisconsin Energy Institute, University of Wisconsin-Madison

Facilitated by Paul Seitz, Director, Strategic Initiatives, Office of the VCFA, University of Wisconsin-Madison

Summary: This session discussed the importance of caring for our scientific staff by limiting their necessity for involvement in facilities issues, being mindful of their administrative burden, and offering competitive salaries. In discussing the maintenance and renewal of our aging facilities, the need to ensure maximum allocation of all facilities by ensuring their modern usability.

Panel discussion included:

- Establishing a defensible budget: models and guidelines to project costs
- Building the necessary talent and resources to build these models
- Comparing financing and funding sources to meet goals
- Investigating how to fund recurring maintenance
- Authorizing and using set-asides – if that’s an available option

Additional Background Data on Regional Economic Development

The Lab Symposium began with a conversation about the role of the university in establishing Madison as a well-known local hub for biotechnology and health research. A recent publication about U.S. Life Sciences Research Talent from Global Commerce Real Estate Services (CBRE) discussed the top life sciences markets in the country. The locations were ranked with several metrics including total number and density of life sciences employees, growth in the number of life sciences workers, and number of PhDs produced in the biological and biomedical sciences (CBRE Research, 2022). As expected, both the east and west coast were highlighted as clusters of life science research, with Boston/Cambridge and the San Francisco Bay anchoring each coast. Emerging markets were also discussed, with attention drawn to areas experiencing high levels of growth as a life

sciences cluster. CBRE stated the “most favorable markets demonstrate both high absolute numbers of talent and strong concentration of life sciences” employees. Despite performing well using their metrics, Madison was not included in their report.

Using the most recent census data from the U.S. Bureau of Labor Statistics and the same metrics defined in the CBRE report, Madison deserves a spot on their map.

- Madison is home to 3,900 life sciences employees
1.03% of the total Madison labor force, with our closest peers included in the CBRE report being Raleigh-Durham with 0.08% and Boston/Cambridge with 1.37%.
- Madison saw a 69% growth rate from 2015 to 2020.
With our closest peers in the CBRE report being the markets with the highest rates of growth, Nashville at ~110% and Dallas-Ft. Worth at 61%.
- UW-Madison alone granted 105 doctoral degrees in biological and biomedical sciences of the 1455 total doctoral degrees granted (7.21%) (National Center for Education Statistics, U.S. Department of Education, Integrated Postsecondary Education Data System).
- UW-Madison alone is only outperformed in share of all PhD’s in biological or biomedical sciences by the New York/New Jersey market and Boston/Cambridge.

Despite the smaller size of our population, Madison displays a degree of specialization in life sciences research only rivaled by the top markets in the country, yet there is no attention paid to Madison in this CBRE report. We are quite literally not on the map.

Lab Symposium attendees called for raising awareness of our specialty biohealth market. Representatives of pharmaceutical and health sciences industries cited the high density of graduates in the biological and biomedical, physical, and health sciences from UW-Madison, as well as the logistical and financial advantages of low cost of living, real estate, and business as reasons they established offices in Madison. BioFORWARD, representing the Wisconsin biotechnology, pharmaceutical, and health sciences industries, discussed the high economic impact of the Wisconsin life sciences sector and their role in better advocating for the advantages to doing business here in Madison.