



# Taking Space Offline

How Bowling Green State University Reined in Deferred Maintenance and Reduced Campus Size

# Facilities Forum

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## Resources Available Within Your Membership

This publication represents only one of our many resources to support members in their drive to improve space utilization. Details about additional resources are provided below.

For additional information about any of these services—or for an electronic version of this publication—please visit our website ([eab.com/facilitiesforum](http://eab.com/facilitiesforum)), email your institution’s dedicated advisor, or email [research@eab.com](mailto:research@eab.com) with “Facilities Forum Taking Space Offline” in the subject line.

### Enhancing Space Data Collection and Validation

*Perfecting Facilities Data Collection and Improving Unit-Owned Data Validation*

This study helps institutions improve the collection and validation of space data. It outlines strategies to enhance Facilities-led walkthroughs of campus space and to improve data validation provided by units. It also previews technologies that support automated collection of space data.

### Working with Academic Leaders to Improve Space Utilization

*Best Practices for Inflecting Behavior Change and Improving Space Utilization Rates*

This study provides strategies to help institutions to identify and correct space misuses and incentivize academic leaders to redeploy underutilized space. It provides nine best practices on improving space governance and better utilizing offices, classrooms, and research labs.

### Unlimited Access to Experts

Facilities Forum members may contact EAB researchers at any time to discuss our findings, request networking conversations, or review related resources and practices.

### On-Demand Webconferences

Register for upcoming sessions to hear our latest findings or access archives of past presentations. Many members convene campus leaders and task forces to attend and share ideas on practices and implementation.



# Introduction

## The Imperative to Reverse Campus Growth

For a graphic depiction of Bowling Green's master planning process, please see page 18.

In 2009, Bowling Green State University launched a new campus master planning initiative to address three pressures that threatened the long-term stability of the institution.

### 1 Regional Decline in High School Graduates Seeking Traditional Residential University Experience

A decline in high school graduates across the Midwest meant increased competition among regional and flagship universities to attract, enroll, and retain students.

### 2 Changing Student Body Composition

An increasing number of students began opting for part-time, non-residential arrangements.

### 3 Aging Physical Campus

In 2008, the Ohio Board of Regents classified over 40% of the institution's buildings as "obsolete," meaning over 40 years old and without significant renovations. At the same time, a separate facilities conditions survey estimated that Bowling Green carried a deferred maintenance backlog of over \$500 million.

Faced with a changing student body and constrained financial resources, senior leaders recognized that Bowling Green could not continue to operate and maintain all of its existing space.



"Proceeding on a traditional course is simply not sustainable long term."

*Steven Krakoff  
Vice President, Capital Planning and Campus Operations*

## Developing a Campus Plan

In response, Bowling Green developed a two-part reinvestment approach: reduce the campus footprint by taking some buildings offline and maximize the potential of existing space through targeted reinvestment. Bowling Green established three principles to align campus investments with institutional needs.



Maximize use of Traditions buildings, the oldest and most historic facilities



Improve the quality and distribution of academic space



Determine which buildings have the most strategic long-term use

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

# Quantifying the Opportunity to Take Space Offline

## Calculating Minimum Classroom Count Requirements

The first step was to determine how much space could be decommissioned without detracting from academic programming. With the campus master plan’s emphasis on upgrading the teaching and learning platform and improving overall asset productivity and utilization, Bowling Green recognized the opportunity to better align the classroom inventory with planned curriculum needs. In 2012, Bowling Green tasked the provost, college deans, and other academic leaders with conducting a study to quantify Bowling Green’s true academic space requirements. At the time, there were 191 classrooms, nearly 1,900 sections, and an average classroom utilization rate of 60%. To better gauge actual need, the academic leaders modeled out the following changes:

- Elimination of low-census and low-demand courses from the curriculum
- Consolidation of low-census sections and multi-section courses
- Increasing station size to accommodate active learning pedagogies
- Optimizing the academic week to ensures courses are meeting between 8 a.m. and 8 p.m., Mondays through Fridays, and between 8 a.m. and 5 p.m. on Saturdays

The table below captures their findings. Bowling Green estimated they could decrease the number of classrooms by 44, to 147, in four years. Ultimately, Bowling Green aims to reduce the number of classrooms to just 114, a 40% reduction from 2012.

### Bowling Green Enrollment and Academic Space Requirements

For more detailed information about classroom utilization by time of day, please see page 19.

	2012	2016	Future Target
Headcount Enrollment	19,916	19,262	19,243
FTE Enrollment	15,994	15,280	15,265
Number of Course Sections	1,897	1,899	1,897
Average Section Size	30	33	33
Average Hrs/Wk Classroom Scheduled	24	31	40
Length of Academic Week, Hours	30	60	60
Classroom Utilization Rate	60% <sup>1</sup>	54% <sup>1</sup>	70% <sup>1</sup>
Number of Classrooms	191	147 <sup>2</sup>	114

1) The 2012 utilization rate reflects a daytime-only schedule. Both the 2016 and future target reflect a combined day and evening schedule.  
 1) Bowling Green ultimately reduced the number of classrooms to 150 by 2016. See page 7 for more information.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

It is important to note that in 2012, Bowling Green had separate day and night schedules. At the time, the daytime academic schedule was 8 a.m. to 4:30 p.m., Monday through Friday. By comparison, the 2016 column reflects a combined day and evening schedule, with classes 8 a.m. to 8 p.m., Monday through Friday.

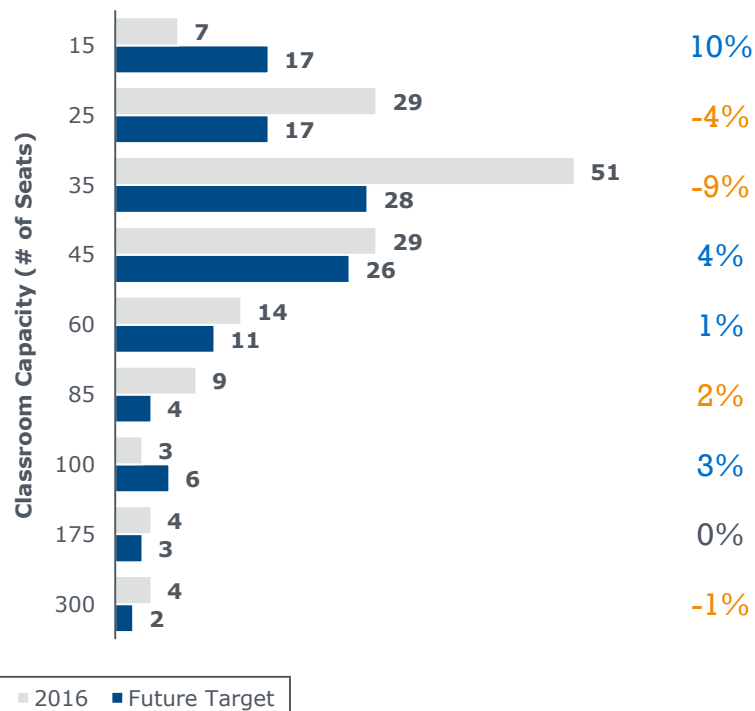
Additionally, while this brief will later explain how Bowling Green identified which spaces to take offline, the institution also:

- Upgraded 80 classrooms between 2012 and 2016
- Consolidated small, adjacent rooms into larger classrooms to support the academic plan calling for larger section sizes and a transition to active learning pedagogies
- Strategically reduced the percentage of smaller, 25-35 seat classrooms and large auditoriums to create more classrooms in the 40-70 seat range

By 2016, Bowling Green was just shy of its 2012 estimate, ultimately reducing the number of classrooms to 150. The chart below shows how the distribution of classrooms will change as Bowling Green consolidates down to 114 classrooms. As a percent of the total number of classrooms, Bowling Green will increase the number of classrooms that can accommodate up to 15, 45, 60 and 100 seats. These changes align with Bowling Green's focus on increasing section sizes and changing pedagogy to support active learning.

**Distribution of Classrooms by Maximum Seat Capacity**  
2016 vs. Future Target

**Change in Share of Total Classroom Pool, by Room Size, 2016 vs. Future Target**



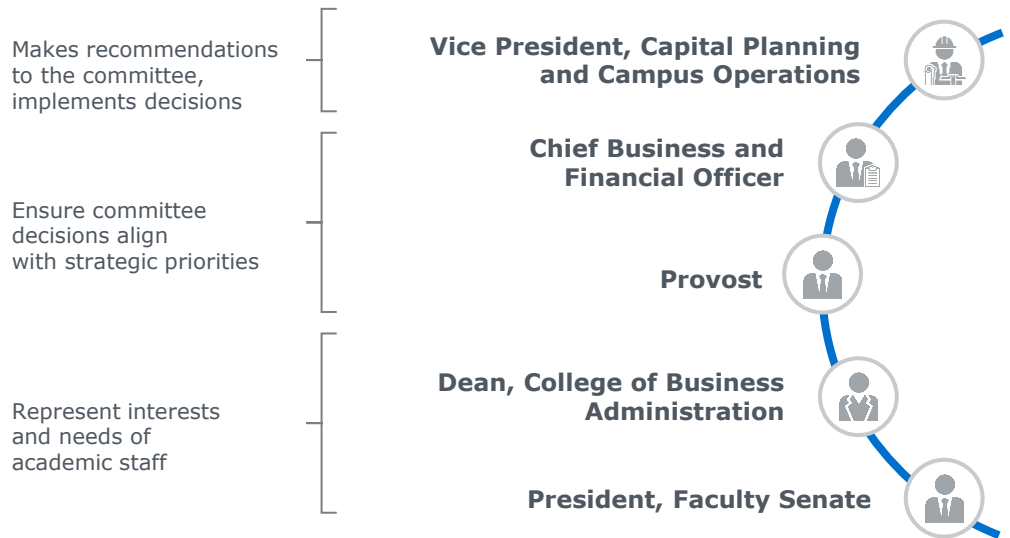
Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

# Making Strategic Building Investment Decisions

## Creating the Building Investment Committee

Once Bowling Green quantified the opportunity to take academic space offline, the next step was to identify which buildings and spaces to invest in and which to decommission. Recognizing that this step involved a series of difficult decisions, Bowling Green assembled senior academic and administrative leaders to form the Building Investment Committee. This committee was a critical decision-making body responsible for translating the campus master plan into actionable milestones. It consisted of five members: the vice president of capital planning and campus operations, the chief business and financial officer, the provost, the dean of the college of business, and the president of the faculty senate.

### Membership of the Building Investment Committee



The committee met regularly throughout 2009 and early 2010. The Facilities leader was responsible for providing data and information to help the committee make informed decisions about campus redesign and building investments. To ensure strategic relevance, every decision the committee reached was sent to Bowling Green’s president for final approval.

## Standardized Criteria for Evaluating Campus Facilities

One of the first sets of decisions the committee had to make was identifying the specific buildings to renovate, decommission, and demolish. To help guide these decisions, the committee translated their campus planning principles into a series of questions to evaluate campus facilities:



Maximize use of Traditions buildings, the oldest and most historic facilities



What should we do with our **Traditions buildings?**



Improve the quality and distribution of academic space



How can we selectively invest to get buildings into **better condition?**



Determine which buildings have the most strategic long-term use



Which spaces truly help advance the **academic mission?**

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.



## What Should We Do with the Traditions Buildings?

The first question the committee considered was how to invest in its Traditions buildings, the oldest structures on campus. The committee acknowledged that the academic neighborhood housing the four structures designated as Traditions buildings—Moseley, University, Hanna, and South Halls—were cornerstones of the university’s academic core. Though these structures, some over 100 years old, had some of the highest renewal needs of any building on campus, senior leaders felt their historic significance was important to Bowling Green’s identity.

Today, the Traditions buildings are being gutted, maintaining the exterior look of the building while modernizing the interior. Ultimately, the Traditions buildings will be repurposed to support investments in signature academic spaces including science teaching labs, new media, business and innovation, and academic best practices that support the Bowling Green experience®.

Of course, there is some difficulty making the old floorplates work with the requirements of modern teaching spaces. Bowling Green’s solution is to match academic space needs with existing architecture, where possible. For example, Moseley Hall (pictured below) was built with high floor-to-ceiling heights, an architectural feature that can most readily be repurposed into a lab. Hanna Hall requires a more substantial gut renovation along with judicious new construction to meet the needs of the College of Business Administration.

### Moseley Hall



BOWLING GREEN STATE UNIVERSITY.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

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## How Can We Selectively Invest to Get Buildings into Better Condition?

Once the committee had decided to invest in the Traditions buildings, the second question they considered was which other buildings to selectively invest in. To guide selective investment decisions and determine which buildings to take offline through decommissioning or demolition, the committee assessed each facility on three metrics:



### **Number of Classrooms**

Highlights academic impact of building



### **Percentage of Total Classroom Inventory**

Illustrates building's impact on number of courses taught each year



### **Facility Condition Index**

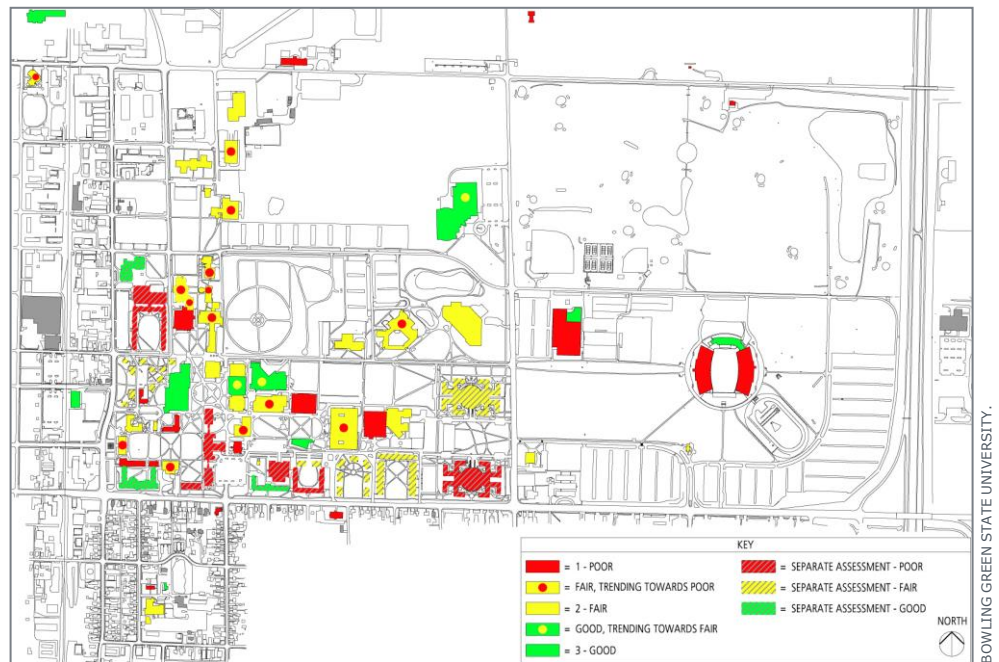
Illustrates current condition and investment necessary to bring building into better condition

The first two metrics quickly signal how critical a building is to Bowling Green's teaching mission. The third metric, the facility condition index (FCI), compares the cost to repair current facilities deficiencies to the building's current replacement value, measuring the relative condition of a building.

Together, these indicators provided senior leaders with a quick snapshot of each building's teaching capacity and condition, enabling them to quickly differentiate buildings in good condition with high instructional value from those in poor condition with limited instructional value.

The committee also considered a facilities condition analysis illustrated by a color-coded map, shown below. The color-coding helped members quickly gauge the condition of every building on campus and in particular, buildings where condition was deteriorating rapidly. To help with master planning efforts, the committee commissioned Capital Planning to prepare cost estimates of restoring the buildings with the greatest maintenance needs.<sup>1</sup>

### Facilities Condition Analysis



1) Bowling Green worked with a group of internal and external advisors to collaboratively develop the master plan.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

## Which Spaces Truly Help Advance the Academic Mission?

The final question the committee considered was how each building could advance Bowling Green’s academic mission and strategic priorities. The committee took the academic priorities and translated them into implications for facilities, outlined below.

Academic Priority	Facilities Implication
<b>Respond to reduction in residential student population</b>	Reduce number of residential beds
	Reduce number of classrooms
	Reduce number of academic buildings
<b>Increase freshmen recruitment and first-to-second-year retention</b>	Invest in general education classrooms and labs that focus on student needs across the freshman and sophomore years; for example, Moseley Hall is being outfitted with upgraded undergraduate science teaching labs
<b>Modernize classrooms to support residential and non-traditional students<sup>1</sup></b>	Create informal study spaces and group work areas to give students and faculty physical space on campus to study and collaborate
	Change classroom design to better facilitate active learning

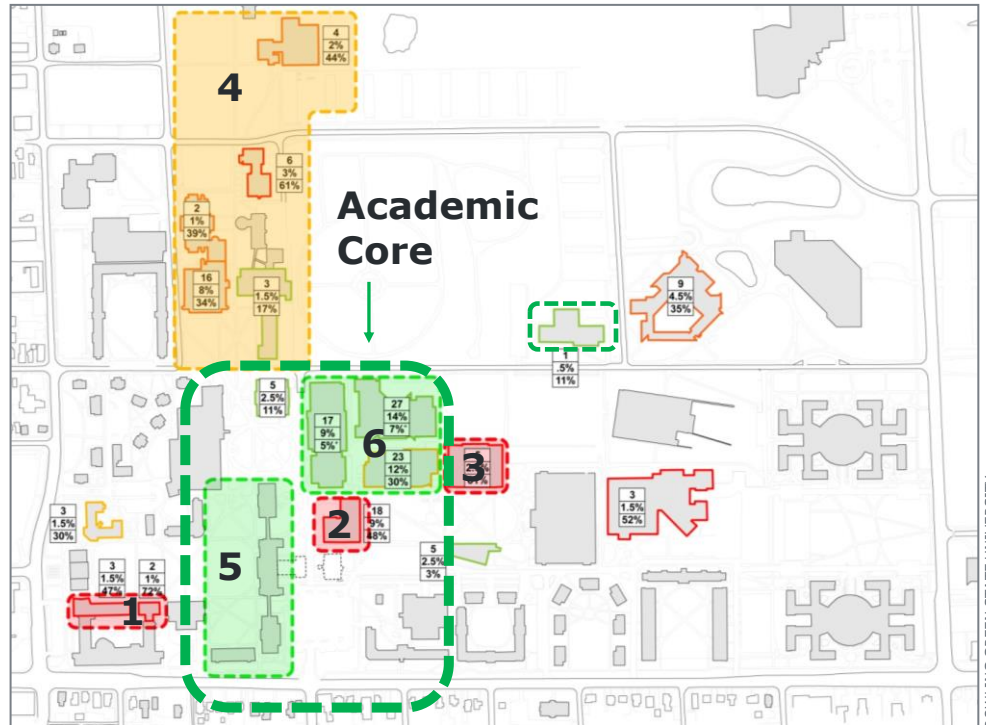
1) Bowling Green anticipates that its residential student population will level off or decrease, while part-time, distance, and adult learning student segments will increase.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

# An Academically Aligned Campus Vision

Ultimately, answering the three questions—what do to with Traditions buildings, how to selectively invest in buildings to improve their condition, and identifying spaces that truly advance the academic mission—enabled the committee to build a plan that identified which buildings to invest in, which to defer investment in, and which to take offline. The map below reflects these decisions.

## Bowling Green State University Campus Investment Strategy

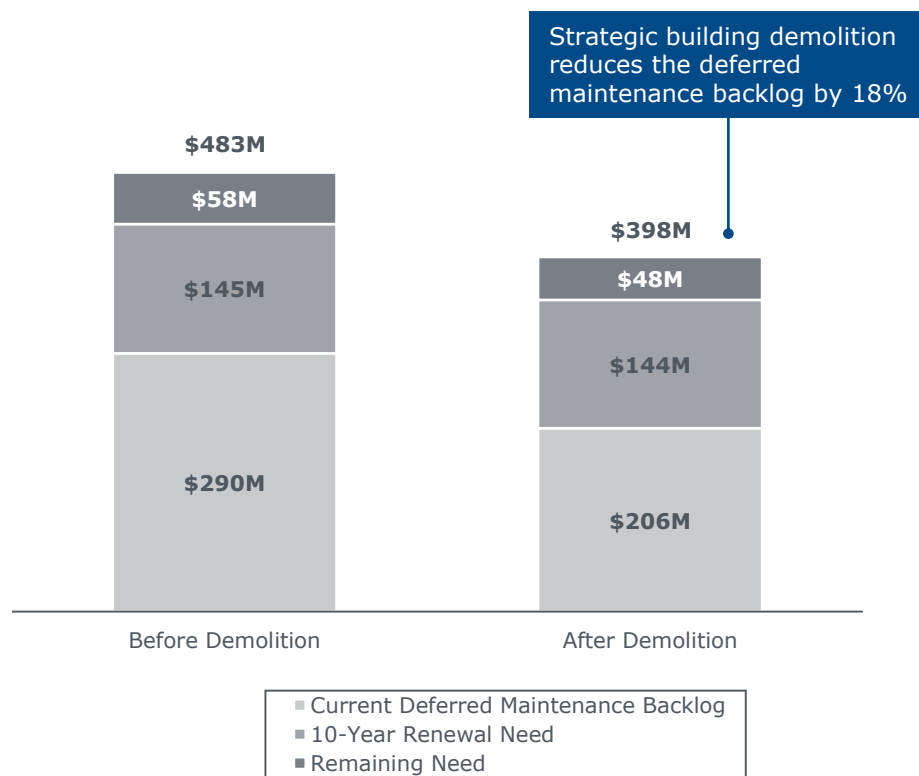


- |  |   |
|--|---|
| <p><b>1. West Hall, Family Consumer Sciences, Administration</b></p> <p>Very high remediation to replacement cost. Some programs can go off site.</p> <p><b>2. Education Building</b></p> <p>Very high remediation to replacement cost. Consider relocation as part of investment in adjacent academic core buildings.</p> <p><b>3. Memorial Hall</b></p> <p>Defer near term investment until justified by growth of enrollment and revenue.</p> | <p><b>4. Math and Science, and Technology Buildings</b></p> <p>Defer investment until justified by enrollment growth and move undergraduate science teaching labs to Moseley Hall.</p> <p><b>5. Traditions Building</b></p> <p>Use investments in Traditions building to improve academic space inventory and avoid cost in other buildings.</p> <p><b>6. Academic “Engine” Buildings</b></p> <p>Invest in enhanced student experience and interaction in these heavily used buildings.</p> |
|--|---|

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

Bowling Green anticipates decommissioning 380,000 square feet by early 2018. By demolishing buildings with no long-term strategic value, Bowling Green’s plan will address significant deferred maintenance needs. Executing the master plan will eliminate approximately \$85 million of deferred maintenance which, in turn, will lower the amount of yearly capital required to address the remaining backlog. Bowling Green now anticipates needing \$40 million dollars in capital expenditure each year to maintain the campus at a reasonable standard, a 13% reduction from before.

### Bowling Green’s Capital Renewal Needs<sup>1</sup>



Finally, Bowling Green will realize operational cost savings from the master plan. Based on 2016 dollars, Bowling Green will save approximately \$2.6 million per year in operating costs by demolishing select buildings while still advancing the academic mission in the remaining buildings. Additionally, the remaining buildings will receive the same level of operating funding, as well as significant investments to support the reengineering of the teaching and learning platform.

1) Data come from Sightlines ROPA+ modeling on behalf of Bowling Green State University.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

# Generating Faculty and Student Buy-In

## Mitigating Campus Resistance

Because Bowling Green set out to make a number of dramatic changes to the campus all at once, senior leaders were cognizant of the need to mitigate resistance and generate support. To achieve this, the Building Investment Committee established a two-part strategy: (1) engage end-users in developing new instructional space design guidelines through prototyping and (2) offer faculty upgraded classrooms in exchange for an extended academic week.

## The Case for Prototyping

The primary purpose of prototyping is to solicit faculty and student feedback about instructional space designs and to ensure new spaces align with user needs and preferences before making large-scale investments. Bowling Green also found that involving end-users in the design process can increase buy-in and alleviate anxieties about using new spaces.

Bowling Green used the following process to prototype instructional space. They converted a floorplate of a major classroom building into an active learning prototype. Once the rooms had been used for regular courses, academic affairs and facilities staff solicited feedback from both students and faculty. One specific question they asked faculty was “what would make you want to spend more time on campus?”

### Prototype to Enhance New Instructional Spaces



#### Develop Prototype to Test Classroom Design

Create prototype classrooms to test functionality of new space, design, and technology

#### Solicit User Feedback to Improve Design

Schedule regular classes in prototyped space and communicate with users to identify design flaws and get feedback

#### Build Classrooms That Meet User Needs

Final designs accommodate most user needs from day one; reflects feedback from every stage of review

Prototyping uncovered a number of important design elements for Bowling Green. First, the committee was able to adjust classroom design to include multiple projectors, screens, and whiteboards to better support faculty teaching preferences. More importantly, prototyping also uncovered that faculty and students craved flexibility in the layout of the room. Faculty generally valued the ability to rearrange the classroom more than having a room with significant technology investments.

Lastly, Bowling Green learned that students and faculty wanted additional touchdown space in hallways to continue conversations after class. This need became particularly apparent when three faculty commandeered a conference room near the newly opened Math Emporium—a dedicated math learning center for students—so they could be available to students throughout the day.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.



### Tips to Maximize Classroom Prototyping

- In the design phase, engage a small cross-section of academic, administrative, student, and support groups in an interactive visioning process to review precedents and pedagogies and clarify goals; this step can create early champions of the prototyping process.
- Provide regular updates to the broader academic community through routine promotional channels (including press releases and the institution's website) and through professional development groups and activities such as teaching festivals and faculty meetings.
- Once constructed, test the prototype against the original goals through a structured evaluation process; expect to make adjustments to subsequent classroom upgrades based on what is learned.
- Include support units like custodial and maintenance staff to get comprehensive feedback on space design and operation.

## Classroom Upgrades

The second strategy Bowling Green used to generate faculty buy-in was to offer faculty upgraded classroom spaces in exchange for an extended academic week. Faculty who were used to teaching no later than 4:30 p.m. initially resisted a push to an extended 8 a.m. to 8 p.m. day. By offering upgraded classroom space with more generalized academic technology and furnishings, faculty were more willing to teach across longer days and in different spaces.

Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.



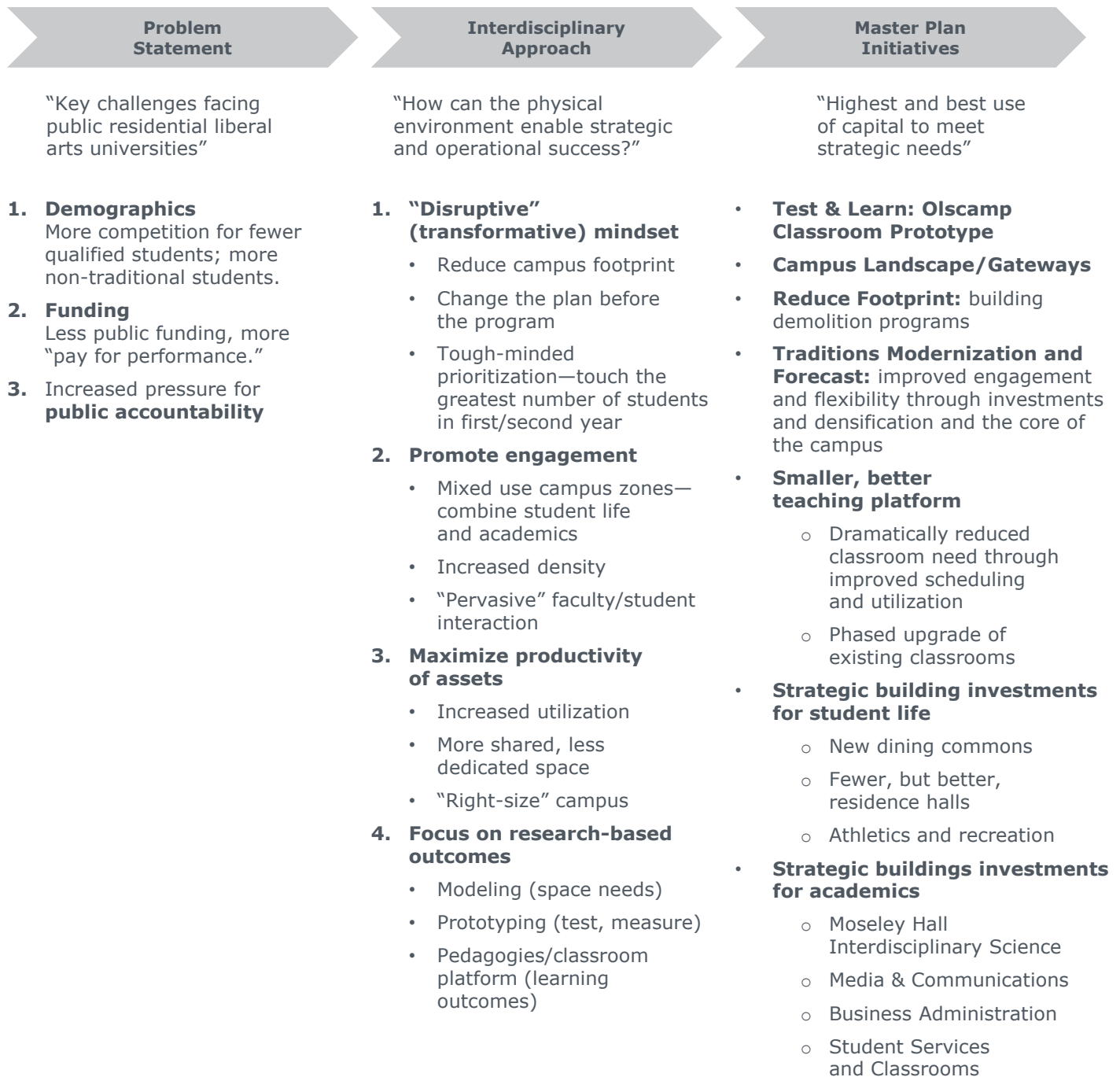


# Appendix

Supplemental Materials from Bowling Green State University

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# Summary of Master Plan Evolution



Source: Bowling Green State University, Bowling Green, OH; Facilities Forum interviews and analysis.

# Classroom Utilization by Time of Day

## Classroom Utilization Analysis, 2012

Classrooms: 192

Seats: 9371

Classes in Session at:	Percent of Spaces Utilized				
	M%	T%	W%	R%	F%
8:00:00 AM	10	31	10	31	0
9:00:00 AM	48	44	49	43	31
10:00:00 AM	71	74	72	75	59
11:00:00 AM	69	26	70	27	59
12:00:00 PM	72	74	74	73	56
1:00:00 PM	58	71	58	71	53
2:00:00 PM	66	75	64	74	52
3:00:00 PM	58	67	59	67	45
4:00:00 PM	46	55	52	56	29
5:00:00 PM	57	59	61	59	2
6:00:00 PM	44	41	40	34	0
7:00:00 PM	43	40	38	33	0
8:00:00 PM	29	21	24	14	0
9:00:00 PM	2	5	3	0	0

Key:	60% - 100%
	40% - 60%
	20% - 40%
	0% - 20%

## Classroom Utilization Analysis, 2016

Classrooms: 153

Seats: 7606

Classes in Session at:	Percent of Spaces Utilized				
	M%	T%	W%	R%	F%
7:30:00 AM	0	1	0	0	1
8:00:00 AM	11	43	12	42	5
8:30:00 AM	61	53	64	51	56
9:00:00 AM	61	54	64	53	56
9:30:00 AM	63	76	69	75	65
10:00:00 AM	62	77	69	76	65
10:30:00 AM	67	69	71	69	66
11:00:00 AM	67	24	71	22	65
11:30:00 AM	61	73	67	73	58
12:00:00 PM	61	68	65	69	57
12:30:00 PM	52	58	53	59	47
1:00:00 PM	50	69	52	66	47
1:30:00 PM	60	76	63	75	58
2:00:00 PM	59	73	63	70	57
2:30:00 PM	54	67	59	65	44
3:00:00 PM	52	68	57	65	44
3:30:00 PM	50	62	57	58	42
4:00:00 PM	50	66	56	58	42
4:30:00 PM	58	66	59	63	5
5:00:00 PM	57	65	59	64	2
5:30:00 PM	44	16	44	16	1
6:00:00 PM	65	59	66	46	1
6:30:00 PM	66	59	65	47	1
7:00:00 PM	65	57	65	46	1
7:30:00 PM	41	40	42	26	1
8:00:00 PM	35	33	35	23	1

Key:	80% - 100%
	60% - 80%
	40% - 60%
	20% - 40%
	0% - 20%



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