The following Facilities Master Plan was conducted by CRP 4910
Realizing the Plan under the instruction of Jennifer Evans-Cowley
and Jason Sudy in the Knowlton School of Architecture at the Ohio State University. The following students contributed greatly to this:

Alyssa Taylor
Ameya Schrimpf
Andrew Pilarcik
Andrew Moore
Arij Yousef
Daniel Sheehan
Daniel Louwers
Dante Farris
Edward Ramey
Jasmine Ringold
John McDermott
Jordan Whisler
Katherine Sims
Lauren Lotze
Megan Moeller
Miao Zhou
Peter Miller
Zachary Cowan
Table of Contents

Introduction........................................................................................................1

Principles............................................................................................................2
Tactical Urbanism...............................................................................................5
Transportation....................................................................................................8
Greenway..........................................................................................................16
University Renovations....................................................................................18

Building Reports

Baker...............................................................................................................20
Bolz..................................................................................................................22
Caldwell..........................................................................................................26
Dreese..............................................................................................................28
Hitchcock.........................................................................................................30
Knowlton..........................................................................................................32
Koffolt and Fontana.........................................................................................35
MacQuigg and Watts......................................................................................37
Scott...............................................................................................................40
Smith...............................................................................................................43

Summary of Costs............................................................................................46
Implementation..................................................................................................47
Conclusion.........................................................................................................50
References........................................................................................................51
The College of Engineering Facilities Master Plan is a document which aims to further the direction of the One Framework Plan by providing a growth strategy for the College of Engineering. The underlying goals of the College of Engineering Facilities Master Plan are to create quality spaces, ensure connectivity, promote a unique sense of community, implement strategic growth techniques, encourage sustainability, and create a safe and comfortable environment in which to learn, live and work. These goals are in accordance with the One Framework Plan while emphasizing certain needs which are necessary for the future of the college.

This study was conducted using extensive data collection, stakeholder engagement meetings, transportation and building assessments, and a tactical urbanism salon. This data was further analyzed to provide multiple practical solutions. Some of these solutions conform closely with the One Framework Plan while others provide a pragmatic alternative plan which is specific to the needs of the College of Engineering. Reports in this study are presented using text, descriptions, photos, captions, and physical renderings which enhance the reader’s understanding of each solution.

The Facilities Master Plan guides a future of planned growth specific to the needs of the College of Engineering. Concern with the changing dynamics of technology and the overall campus community are ingrained throughout the report to further the success of the College of Engineering.
The changes recommended in the College of Engineering Facilities Master Plan have been guided by a defined set of Principles. All strategies and tactics proposed in the plan have been tested against these Principles for consistency. The Principles are as follows:

• **Growth:**
  Strategic **Growth** is the principle force of change in regard to future expansion of the College of Engineering. To ensure and accommodate growth, we must be vigilant to acquire and implement the use of up to date technology, incorporate building spaces that support flexibility, and practice diligent fiscal responsibility to ensure the longevity of strategic growth.

• **Sustainability:**
  Implementing **Sustainability** in all new construction and renovation projects is an aspect of our design principles that will not only fulfill our social responsibility, but improve long-term function. By encouraging alternative transportation, energy efficient building designs, as well as sustainable materials, the College of Engineering can enhance and secure a hand-in-hand relationship with strategic growth.

• **Connectivity:**
  Ensuring **Connectivity** is crucial to the functionality of the College of Engineering. By working towards a simpler infrastructure system and implementing elements such as the “complete streets” concept as well as design strategies such as woonerfs, we can accommodate not only visitors and frequent users, but encourage a safe and flexible multi-modal area of campus.

• **Quality Space:**
  Creating **Quality Spaces** is essential for encouraging an engaging and interactive educational environment. High quality interior and exterior spaces will create a sense of identity and destination for each program within the College of Engineering. By implementing good interior design and matching function to form, student spaces will foster educational needs with inviting spaces for studying, researching, meetings, and more.

• **Safety:**
  Safety is a fundamental expectation of all campus users and can be improved by the use of good design practices. All modes of transportation, lighting, and other safety resources must be accommodated in a manner that allows safe interaction and access to campus.

• **Community:**
  Promoting a unique sense of **Community** is a key component to the vitality and success of any social environment. Fostering a sense of community will be accomplished through welcoming social spaces. These central destinations will encourage interaction among the different programs in the College of Engineering.
The One Framework is a comprehensive and flexible plan for the Ohio State campus that uses an integrated approach to planning to allow the long-term advancement of The Ohio State University. This plan is a vision to create a 24/7 campus with live-work communities that serves all populations.

The Principles of the One Framework Plan are as follows:
- One University
- Campus Life
- Space
- Civic Infrastructure
- Practice

Working with the One Framework Plan

During the planning process, our studio found it crucial to create a set of principles that closely integrated and complemented the One Framework Plan. Our Facilities Master Plan, like the One Framework Plan, aims to take care of physical resources, connect to our communities, and organize spaces that create meaningful experiences for a safe and accessible campus.

On the following page, the diagram represents how intricately our principles coincide with the One Framework principles.
*Each plan goal has a color and number, these colored boxes appear alongside each of the plan concepts articulating the connection back to the goals.
The inaugural Columbus/Dresden Biannual Tactical Urbanism Planning Salon was an interactive way to re-imagine existing and underutilized space in the North academic core. Specifically, the event brought students and professional planners together in a one-day takeover of the outdoor plaza between Knowlton Hall and Hitchcock Hall on the Ohio State campus. The purpose: to transform a little-used space with a limited budget, lots of creativity, and many volunteers—with the final set up acting as a visualization of the potential for the College of Engineering (CoE).

Jason Roberts, founder of the Better Block project, kicked off the day with an excellent lecture on tactical urbanism methods. He emphasized the importance of doing, not just talking, to get new ideas on the ground for people to see for themselves what is possible. Roberts’ work with the Better Block Team is geared towards creating livable streets, and his message at our Tactical Urbanism Salon was that phased and low-cost projects often produce more effective and popular end results than a single uninformed, capital intensive project.

Lunch for the event was provided by RedHot food truck, and salon participants ate in the plaza. Meal choices included tacos, chips and fresh salsa, black beans, and rice. More important than the tex-mex cuisine, however, was that the food truck itself attracted much attention. Students passing by on their way to class noticed the new food option in the vicinity and were trying to buy lunch there during the event. It was obvious that a food truck program in the Knowlton plaza would thrive—an idea that can be translated into the final recommendations for the college master plan. A similar program has proved very popular at the University of Wisconsin-Madison Library Mall, where over 40 vendors sell a variety of local and international foods to those who work and study in Madison. They have set a great precedent for food truck courts that could easily be replicated at other universities, including Ohio State.

The remainder of the tactical urbanism salon was dedicated to participatory
workshops and the actual transformation of the plaza. The workshops varied in degrees of success, though the whole purpose of the salon was not to find perfection but rather to freely sample whatever ideas came to mind for the space. Jason Roberts’ earlier discussion urged phased planning and smaller, less capital-intensive projects, which set the stage for workshop participants to excitedly transform the plaza through chalk art, hanging mirrors, way finding signs, and a temporary bike lane. In this sense, the salon was a huge success because the entire day required people power, not dollars, and exemplified the type of pop-up urbanism that can eventually bring long-term change to a block, plaza, or corner.

The bike lane was perhaps the most interesting experimental element. Many people seemed glad to see multi-modal order brought to the plaza, but even more ignored the bike lane altogether. Regardless, seeing the infrastructure physically drawn out on the pavement gave everybody at the salon a better idea of how users would react if a bike lane were actually built—observations that are a lot cheaper to obtain with a temporary lane than by building a permanent and expensive one that ultimately fails.

The conclusion of our tactical urbanism salon left the studio teams with many thoughts, concerns, and visions for this particular space, and for the College of Engineering plan in general. The salon was unlike anything most of us had ever organized or participated in before, and it proved to be a great learning experience for all.
A few overall key takeaways from the day that can be incorporated into the CoE plans:

1. The chalk art was beautiful and very fun to create but was more time-consuming than expected. This approach to a space “takeover” is very good for engaging the public.

2. The availability of food will almost always attract people, and can be a serious tool in reinvigorating all types of space, attracting local businesses, and increasing “stay power” in an area.

3. The bicycle lane was a practical approach to changing user behavior in the plaza and is an experiment that can be replicated in many other areas around campus as an inexpensive way to gauge cyclist, pedestrian, and driver response to infrastructure changes. Proper implementation of the proposed bike paths in the North Academic Core green corridor can be informed by first marking out temporary bike paths in the corridor and observing their use before making them permanent.

4. As a studio, we struggled with the short time frame in which to organize this Tactical Urbanism Salon. However, a lesson was learned in “blackmailing” ourselves with a deadline in order to force change. By embracing the chaos and pushing forward with the project, we made things happen by doing instead of just talking an idea to death.
Data collected during the assessment phase of this report indicates that various improvements can be made to the transportation network throughout the College of Engineering. The analysis elements that inform the physical design process were very data driven in approach. The various elements analyzed included bicyclist activity, bus traffic, and mapping of pedestrian routes and origin destination findings. The data collected demonstrated a number of areas of improvement throughout the College of Engineering. The results from the data collection observed that safety and connectivity are two principle focuses of interest that are currently lacking. A number of improvements are being proposed in order to positively transform the physical environment in order to increase both safety and connectivity for a multi-modal transportation network.

The majority of bicyclists interviewed use sidewalks to navigate through campus and most do not feel comfortable riding on the roads, which is both a safety concern and connectivity issue. In order to improve the bicycling network and facilities throughout the College of Engineering, various design approaches have been created. First, expanding the on-street and off-street bicycle network is crucial in order to increase bicyclist safety and connectivity. Two North/South bicycle connections are being proposed in order to expand the bicycling network. A designated bicycle lane on College Avenue is being proposed, suggested as a way to segregate the bicycle traffic from both vehicular and pedestrian traffic to increase safety and instill increased comfort for bicyclists. This approach will ensure that the bicycling system connects to and integrates with the existing transit system. Secondly, a bicycle path is being proposed for the future greenway between 17th and Woodruff Avenue to also increase connectivity and safety.

The Origin Destination Survey indicated that there is strong pedestrian activity on campus. Specifically, the Northeast side of campus saw the most activity. Once on campus, 76% of people surveyed chose to walk between their destinations. These findings inform many proposed physical design approaches in concepts such as the “woonerf” style on streets like 19th, 18th, and 17th in order to accommodate the pedestrian, bicyclists, and bus traffic in a shared space and to slow vehicular traffic. Three design alternatives to the street network throughout the north academic core were created in order to accommodate such a large pedestrian presence. All three alternatives establish a pedestrian dominated zone between Lane Avenue and 17th avenue with a design that can accommodate vehicular traffic, but also discourages it. Specifically, alternative one suggests restricting vehicular access on Woodruff between Tuttle and College to only authorized university vehicles, transit vehicles, pedestrians, and bicyclists. Alternative one also suggests establishing major pedestrian crossings along 17th at non-intersections. A second alternative suggests extending Neil Avenue to Woodruff, however, with a design that
discourages vehicular traffic. Along Woodruff Avenue, the addition of bus pull offs are suggested in alternative two to facilitate efficient traffic flow. Like alternative one, alternative two also establishes pedestrian crossings at non-intersections along 17th Avenue and also along Woodruff Avenue. Finally, alternative three suggests extending Neil Ave. to Woodruff as a major North/South connection in order to facilitate through traffic. The addition of bus pull offs are suggested again in this alternative in order to facilitate efficient traffic flow. Observations indicate that differences in street design result in the differences of pedestrian and bicyclist behavior. In order to accurately accommodate each mode of transportation, the physical design of the street was carefully planned. The key challenge that is being addressed through the physical design approaches is to better integrate the various modes of transportation to increase safety, efficiency, and connectivity.
In order to increase both on-street and off-street bicycle connectivity and safety, the diagram suggests designating a bicycle lane on College Ave., installing a bicycle path down the greenway, and allowing bicycle traffic in the shared woonerf spaces along Neil Ave., 17th ave., and 18th ave.

Proposed bicycle lane and bicycle box in order to safely turn left onto Woodruff Ave.
Consistent with our goal of reducing vehicular traffic on the internal streets of the campus, bus stops should be moved to the perimeter street network. The elimination of the two stops located along 19th and Neil Ave. will not cause any reduction of service nor have significant impacts on the system coverage.
One of the main challenges Ohio State currently faces is monitoring the flow of traffic between automobiles, bikers, and pedestrians. Several incidences of harmful collisions amongst the three modes have occurred on campus this year and continue to grow. One of our principles, like the one framework plan, stresses the need of definitive safety at Ohio State to support the well-being of students, strong connectivity throughout campus, and a quality environment for drivers, bikers, and pedestrians alike. As a way to alleviate the tension between the differing modes of transportation, our team has suggested the integration of “woonerfs” hemmed within the interior of campus, mainly on 18th and 19th Avenue between College and Neil Avenue.

A woonerf, known as a “living street”, originated in the Netherlands and is characterized as a road that allows motorist activity, yet gives precedence to pedestrians and bikers. The concept of the woonerf began in the 1960’s with the Dutch architect Niek De Boer who wanted to correct two problems in city streets: inconvenient traffic flows as well as decaying streetscapes. The common techniques utilized to obtain these conditions are elements such as shared space, lower speed limits, and traffic calming methods. For instance, under Article 44 of the Dutch traffic code, motorized traffic in a woonerf or “recreation area” is restricted to walking pace. The woonerf idea can be compared to “home zones” in the U.K., or “complete streets” in the United States.

Physical differences can be recognized when comparing woonerfs with more common, auto-dominant streets. For example, the typical streetscape (auto-dominant) is linear in form and consists of sidewalks, curbs, and designated crosswalks. On occasion, the road will present a bike lane and vegetation. Woonerfs, on the other hand, take on a different appearance. Mostly used as gateways to busier roads, these living streets don’t include curbs so they are flush with the sidewalks with intermittent parking. They gather park or recreational features, such as playgrounds, benches, plants, and trees. In addition, a woonerf is typically

---

2. The standard sign indicating a woonerf street.
marked by a blue sign with a picture of a pedestrian, a child playing, a house, and a car.

Although physical changes create an enjoyable environment, what really makes woonerfs special is the psychology behind the design. The elimination of curbs creates a flat plane, positioning the car and pedestrian on the same level. The shape of the street, the benches, plants, and trees are not only meant to distract and direct the people on-foot, but also those in cars. This idea of shared space is the key to understanding the purpose of the woonerf. In a report conducted about the woonerf, residents of Hesselterbrink stated to “now know that car drivers should become residents. Eye contact and human interaction are more effective means to achieve and maintain attractive and safe areas than signs and rules”. Studies have shown a significant decrease in traffic accidents, as well. For instance Holland’s implementations of woonerfs have resulted in a 40 percent decrease in traffic accidents. In essence, the lack of rules and limitations on a woonerf actually causes drivers to pay more attention to their surroundings as opposed to resulting in reckless behavior.

The Ohio State University has identified substantial jaywalking, illegal bicycle activity, and several motorist accidents within campus boundaries. Due to the urban conditions, the close proximity of residential and academic facility locations, and the variety of transit options, we feel that campus would be an ideal location to implement the woonerf concept. The idea has been applied on 17th Avenue between High Street and OSU’s stadium, eliminating curbs and planting more trees curbside as a traffic calming method along with a focus on pedestrian safety. A majority of the project was completed in 2012 and has shown a significant decrease in vehicular activity, by means of many drivers now using Lane Avenue as planners had anticipated.

To encourage the continual remodeling of the streets within the Academic Core North, we propose to execute the woonerf model on 18th, 19th, and Neil Avenue between 17th and Woodruff Avenue, giving priority to 18th Avenue. We believe that 18th is more critical than the other streets due to its current location and pedestrian orientation on campus.

As a way to ease the transition of street types, we would recommend applying a phased implementation plan, an idea we gathered through the tactical urbanism event we hosted earlier this month. This method of intervention is inexpensive, fast-paced in alteration, and ultimately temporary. Due to the positive results of our event, we find that this approach is a simple, temporary way to evaluate the success of 18th Avenue as a woonerf before beginning renovations on 19th and Neil Avenue.

In support of our quality spaces and sustainability principles, we propose to incorporate a variety of materials in the woonerf to delineate transportation
uses as well as applying permeable surfaces for sustainability. For instance, a variety of brick and concrete would reinforce separation of differing transit types in an aesthetic manner without the use of curbs, lines, or signage. In addition, we would recommend including permeable resources in the landscaping and paving projects as a way of increasing sustainability and decreasing maintenance.

In terms of expenses, we believe it will closely equate to the costs needed to renovate 17th and Woodruff Avenue.

**Woonerf Elements**

A. Curbside trees to distract and direct motorists and improve aesthetic quality

B. Standard sign indicating the area is designated as a Woonerf. Permeable paving is used as a functional and sustainable alternative, and modern bike racks are used to encourage bicycling.

C. Multiple paving materials are used for visual direction for pedestrians and bicyclist while supplanting the other aesthetic qualities. A pop-up cafe is used for gathering, socializing, studying and eating - encouraging a pedestrian dominant area.

D. Green buffers to separate pedestrian and cyclist traffic.
The current view of 18th Avenue.

18th Avenue with the woonerf concept applied.¹
The green corridor proposal stretches from Woodruff Ave on the north to the The Oval on the south. Originally proposed by the University’s One Framework Plan, the corridor is described as one of three paramount urban design moves for the North Academic Core. The framework plan states: “The central north-south green spine through the middle of the Academic North Core, connects the north residential community to the oval and beyond.” This will be good for North Campus and the College of Engineering as it will bring students to and through our district and has great potential to be a destination for students to study, relax, and socialize.

Building off of this need for a green corridor, ideas were generated on how to make the greenway successful. After careful analysis of successful green corridors, the study team concluded that enhanced lighting, installation of public art, and the addition of tables and more seating are essential to the quality of life. Using the oval as a model of success, the corridor will be mostly grass with sidewalks cutting across it. The last, and one of the biggest additions, will be a bike path that stretches the length of the corridor, connecting Woodruff to 17th. This bike path is a part of the plan to establish a bike network throughout the north academic core and eventually throughout all of campus. It separates the bike traffic from the pedestrian traffic to enhance safety and serves as one of three key north-south routes for bikers to utilize.
The green corridor will feature enhanced lighting, additional seating and tables, public art, and will remove the concrete tree beds and walls (left) to make way for an open grassy area (right).

The green corridor will feature a permanent bike path to help separate bikers and pedestrians and allow bikers to safely and legally traverse campus.
University Renovations

With hundreds of buildings dotting its campus, the Ohio State University regularly must make decisions on which aging buildings to renovate and which to demolish. As part of the College of Engineering Facilities Planning process, a number of the recent renovations across campus were selected for examination to generate ideas of creative ways to address the current and future academic needs of students, faculty and staff.

One common element found throughout the renovation projects is the expansion of natural light in buildings. Most buildings that studied were built in the middle of the 1900’s, a time period when closed buildings, with minimal natural light were constructed to achieve utility benefits. With improvements in building materials it is now possible to provide greater natural light, now still achieving utility efficiencies. For example, walls were removed in the Biological Sciences building in order to allow for more light in the hallways. The Thompson Library addition includes a primarily glass façade. The Physics Research Building boasts a massive lobby that lets in sunlight, both directly and from adjacent offices. Perhaps the most impressive example comes from Cunz Hall, where new glass-enclosed stairwells were added to give a transparent, welcoming, and open feel to the brutalist-style building. The example of Cunz proves the importance of including aesthetically pleasing architecture and natural light in any new construction or renovation project that the University commissions.

A crucial element of student engagement with campus facilities is the quality of lab space that students and faculty work in. Lab spaces vary significantly, from wet and dry research labs, to computer labs. One impressive space is the first floor computer lab in Hagerty Hall. This lab consists of 30+ Apple iMacs loaded with state-of-the-art software, televisions for telecommunicating, a plotter, and a regular color printer. Essentially, the technology in this lab space radiates feelings of intelligence, future, and sophistication that might be seen in the high tech offices of Silicon Valley. In addition to the fantastic technology, the lab space was designed in a way that fostered interaction and group work based on the table and chair configurations- a key trait of the “real world” workforce and a great idea to practice while still in school. This lab space

These observations were drawn after reviewing the renovations at the following buildings on campus:

- Biological Sciences Building
- Biomedical Research Tower
- Cunz Hall
- Hagerty Hall
- Hayes Hall
- Hopkins Hall
- Institute for Biomedical Research
- Jennings Hall
- Lincoln Tower
- Mathematical Biosciences Institute
- Mirror Lake
- Murray Hall (Institute for Biomedical Research)
- Ohio Union
- Physics Research Building
- Prior Hall
- Pomerene Hall
- Thompson Library
serves as an example for future computer labs in libraries and other buildings. Similarly to computer labs, quality research lab space is critical for conducting cutting-edge research and attracting superb students and faculty. A great picture of this significance is seen in the Biological Sciences Tower, which is currently undergoing a floor-by-floor renovation. The difference between updated versus outdated research lab space in the Tower is quite striking. Sleek new equipment, furniture, and personalized spaces complete with necessary safety features such as fume hoods, humidity & climate control, and refrigeration define these renovated lab spaces. This is in sharp contrast to the dingy, dated, and potentially hazardous work environments that occupy the original lab spaces the building. Once again, these lab spaces serve as prime examples for future research labs.

A final observation of the recent renovations amplifies the importance of creating functional student lounge and social spaces in new buildings. Renovations in nearly every building toured featured emphasis on some type of lounge area. Cunz Hall now boasts a bright, inviting lobby that has plenty of seating options.

The renovated floors of the Biological Sciences tower and the Physics Research Tower have outlets located near windows with several comfortable chairs that invite students to kick back and stay a while. The renovation of Hagerty Hall created what was probably the most intriguing social space studied in the renovation tour, creating an inner courtyard from what was once a lecture hall. The courtyard showcases plenty of creative seating that could also double for public art. Lounge spaces, both interior and exterior, are going to be a critical element of future building design and renovations for the University. In summary:

1. Windows are a hot commodity, and sometimes hard to come by
2. Transparent work areas encourage interaction and allow natural light
3. Modern lab spaces are both flexible and comprehensive
4. Social spaces near elevators and restrooms foster spontaneous interaction
5. Unique furniture, bright paint, and interesting materials create character
Baker Systems

Summary

Baker Systems was constructed in 1968 on Neil Avenue near 17th Avenue, adjacent to a green space. The building is home to the Integrated Systems Engineering and Aviation Programs. Baker Systems is an aging building that is reaching the middle of its life cycle, with a Facilities Condition Index score of 64.7%. Students complain about the overall quality of the interior including a lack of lighting, temperature swings, and a general lack of upkeep reflected in items such as dirty walls. The basement shop lacks adequate HVAC making working conditions uncomfortable and limiting the types of research that can be conducted due to the lack of climate control. The main lobby of the building is congested with vending machines and lacks the proper amount of seating. It is not uncommon to see students sitting on the floor.

Recommendations

1. Update Main Lobby
   Priority: Medium

2. Basement HVAC installation
   Priority: High

The existing main entrance lacks an inviting and comfortable feel when walking into the main lobby of the building.
1. Updated Main Lobby
   • Category: Renovation
   • Priority: Medium
   • Estimated Cost: $30,000
   • Time Frame: 1-5 years
   • General Summary: The current main entrance to Baker Systems lacks the inviting comfort one should feel when walking into a main lobby of a building. Currently there is no adequate place for students or visitors to sit after entering the building, aside from the floor. The main lobby is overcrowded with vending machines, making the lobby appear to be smaller than it is. The addition of comfortable seating would add to the comfort of the lobby. Wayfinding signage in the lobby would allow for students to more easily find their classroom.

2. Basement HVAC installation
   • Category: Maintenance
   • Priority: High
   • Estimated Cost: $400,000
   • Time Frame: 1-5 years
   • General Summary: The basement level of Baker Systems lacks a HVAC system and thermal control. This issue was raised when talking with stakeholders, particularly the students and faculty who work in the basement. The lack of climate control has limited the ability of researchers in the manufacturing area to apply for research grants. Installing a better HVAC system would allow for a more comfortable climate to work in, along with not limiting the research done within these facilities due to current temperature control problems.
Summary

Bolz Hall, built in 1960, has a Facility Condition Index Score of 56.7% and is in need of major renovation. The University’s Capital Plan identifies the need for renovation of Bolz. The data collected during the assessment phase and discussions with stakeholders concur with the need for renovation. Bolz central location along the academic main street and heavy student use allows for exciting opportunities of change to occur. Both the Civil, Environmental and Geodetic Engineering and Aerospace Engineering faculty, staff and students identified key renovations.

Recommendations

1. Upgrade Network Connections
   Priority: High

2. HVAC Improvements
   Priority: High

3. Combine Bolz/Hitchcock Lounge Space
   Priority: High

4. Complete Building Renovation
   Priority: Medium

The sleek-looking renovation of the lobby and stairwell at Cunz Hall is a great example of what Bolz Hall has the potential to look like.
1. Upgraded Network Connections
   - Category: Maintenance
   - Priority: High
   - Time frame: 0-5 years
   - Estimated Cost: $20,000 (Assuming $500 per network drop, with 40 drops needed)
   - General Summary: Bolz currently has 40 wiring projects in queue for upgrade. These wiring projects mainly consist of adding additional network drops in labs due to the large increase in internet usage, and increasing the amount of outlets in labs. Connection to the Supercomputer has also been requested. Upgraded wiring will be more energy efficient, and speed along connections to the internet- an upgrade all users will be able to experience.

2. HVAC Improvements
   - Category: Maintenance
   - Priority: High
   - Time frame: 0-5 years
   - Estimated Cost: $1,000,000
   - General Summary: The building lacks adequate climate control. With no air conditioning in the lab areas, warmer months cause the building to become unbearably warm and impossible to conduct certain types of aerospace experiments.

3. Combined Bolz/Hitchcock Lounge Space
   - Category: Maintenance
   - Priority: High
   - Time frame: 0-5 years
   - Estimated Cost: $28,000 per lounge
   - General Summary: Neither Bolz nor Hitchcock have adequate public lounge space. The buildings seem to be geared exclusively for classroom engagement, and nothing more. Investing in lounge space invites students to be in the buildings outside of class time. Students whose majors and classes are located in these buildings will begin to see the buildings as more of a “home” to socialize and do homework, rather than just a place to go to class. Locations for lounges could include the open space connecting the two buildings for example.

4. Complete Building Renovation
   - Category: Physical change (Major renovation)
   - Priority: Medium
   - Estimated Cost: $32,800,000
• Time Frame: 15-20 years
• General Summary: The building renovation should modernize labs and teaching spaces. In addition, the renovation provides the opportunity to provide an eye pleasing entrance to the building at the corner of Neil Avenue and 19th Avenue. Hundreds of students pass through the current narrow entryway and stairwell to get to class every hour. A more exciting and functional entrance and lobby space, like the one recently constructed at Cunz Hall could prove to be an exciting and worthwhile improvement to the building.
Caldwell Lab's unique exterior architecture achieved positive survey responses.

The current design of 19th Avenue outside of Bolz Hall (left). By employing permeable paving techniques, as seen in this vision for the street (right), water will soak into the ground rather than being funneled into the already strained storm sewer system.
Caldwell Laboratory

Summary

Built in 1959, Caldwell Laboratory is one of the oldest buildings in the College of Engineering. It currently houses Electrical and Computer Engineering. The building is connected with the journalism building and Dreese Laboratories. Caldwell Laboratory has a number of classrooms, contributing to the academic main street on Neil Avenue. The Facility Condition Index Score of Caldwell is 55.1%, indicating that the building is in need of significant renovation. Stakeholders identified that the building lacks public seating areas and that the facilities are dated. Caldwell has been identified for rehabilitation or replacement as part of the University’s Capital Needs Inventory. The following are recommendations for improvement of Caldwell Laboratory.

Recommendations

1. Hallway Renovation
   Priority: High

2. Improve Signage
   Priority: High

3. Building Renovation
   Priority: Medium

Creating this type of area would make Caldwell more comfortable and encourage use of the building. The addition of carpeting makes the older buildings seem more up-to-date.\(^1\)
1. Hallway Renovation
   • Category: Maintenance
   • Priority: High
   • Estimated Cost: $25,000
   • Time Frame: 1-5 years
   • General Summary: The hallway provides valuable space for students to study and be more comfortable. Space can be made available by removing the lockers and incorporating seating for students to prevent students from sitting on the floor.

2. Improve Signage
   • Category: Maintenance
   • Priority: High
   • Estimated Cost: $5,000
   • Time Frame: 1-5 years
   • General Summary: Caldwell lacks signage to help users with wayfinding. Designation of entrances are needed due to the fact that the journalism building is attached and has similar building materials, making it confusing to decipher between the two. Internal wayfinding signage would allow faculty, students and staff to understand how to connect through the buildings and to find key classrooms.

3. Building Renovation
   • Category: Physical change (Major renovation)
   • Priority: Medium
   • Estimated Cost: $26,230,000
   • Time Frame: 10-15 years
   General Summary: Being an older building, Caldwell needs a mid-life cycle renovation, updating mechanical systems, as well as aesthetic renovations to improve the usability of the building. As part of the renovation, HVAC should be added to the basement to increase the usability and comfort of this portion of the building. Classrooms should be updated to meet current and anticipated future teaching needs. Laboratories should be upgraded to meet the power needs of electrical and computer engineering faculty.
Dreese Laboratory was constructed in 1969 under the name Electronics Laboratory. In 1994, the building quadrupled in size after the completion of the Dreese Addition and has a current Facilities Condition Index of 68.7%. Three above ground walkways connect Dreese to surrounding buildings; Caldwell Laboratory, Baker Systems Engineering and the Northwest Parking Garage. Dreese Laboratory is home to Computer Science and Engineering and Electrical and Computer Engineering. Stakeholders found wayfinding to be difficult in part due to the lack of a uniform interior color scheme and lack of signage. The main lobby of the building lacks quality seating and aesthetic appeal. There are no wayfinding signs in the lobby providing direction on how to reach desired locations, such as departmental offices. With a location on the academic main street and a number of classrooms, wayfinding and seating would add significantly to the building.

Recommendations

1. Update Main Lobby
   Priority: Medium

2. Update Signage
   Priority: High

An example of what a new lobby would bring to Dreese Laboratory. A functional and comfortable lobby would welcome visitors to the building and help alleviate wayfinding confusion.
1. Updated Main Lobby
   • Category: Maintenance
   • Priority: Medium
   • Time frame: 1-5 Years
   • Cost: $50,000
   • Building Summary: The current main entrance to Dreese Lab lacks adequate places for students to interact and communicate with each other. Limited seating inside the main lobby usually leaves people sitting on the floor or stuck standing waiting for the large lecture hall right inside the building’s entrance. The main lobby of Dreese feels inviting with the large floor to ceiling windows, allowing for plenty of natural light and a view of campus but does not offer anyone a reason to do anything but pass through. Adding more adequate places for people to sit would open up the lobby to become a more interactive space in the building.

2. Updated Signage
   • Category: Maintenance
   • Priority: High
   • Time frame: 1-5 Years
   • Cost: $1,000
   • Building Summary: Signage needs to be improved within the lobby of the building. There is no signage once inside the main lobby to point you towards the elevators, departmental offices, or even a sign that distinguishes the addition of Dreese that connects to Baker Systems as being part of one or the other. The connecting hallway on the second floor of Dreese and Baker Systems also needs a bigger, more noticeable sign to notify people that they are leaving one building and entering another.
Hitchcock Hall

Summary

Home to College of Engineering Administration, the Engineering Education Innovation Center (EEIC), Civil, Environmental, and Geodetic Engineering, and Engineering Career Services offices, Hitchcock Hall can be considered the “headquarters” of the college. However, the building’s ominous and dated appearance leaves a poor impression on visitors, students, and faculty. The stakeholder engagement assessment revealed that the benches are an awkward length and students feel uncomfortable sharing them. Faculty, staff and students did not feel the building expresses the importance of engineering and that office and laboratory spaces don’t meet current needs. Classroom services and the departments agree that upgrades are needed to the classrooms to meet modern teaching needs. Since Hitchcock remains functional, the focus for renovation should be on updating mechanical systems and upgrading the aesthetics to ensure that Hitchcock is a flagship building for the College.

Recommendations

1. Roof Replacement
   Priority: High

2. Complete Building Renovation
   Priority: Medium

A complete renovation would allow for the modernization of the building and allow for the branding of the building as the flagship engineering building.
 Recommendation Details

1. Roof replacement
   • Category: Maintenance
   • Priority: High
   • Estimated Cost: $870,000
   • Time Frame: 0-5 years
   • Summary: Replacing Hitchcock Hall’s roof in the near future will ensure that the building remains functional. It is a necessary expense and will help prevent water and wiring damage on the interior.

2. Complete Building Renovation
   • Category: Renovation
   • Priority: Medium
   • Estimated Cost: $29,000,000
   • Time Frame: 10-15 years
   Summary: A complete renovation would allow for the modernization of the building and allow for the branding of the building as the flagship engineering building. Key to the modernization of Hitchcock is a complete renovation of the exterior west wall to create a sleek, contemporary exterior façade, including windows allowing more natural light throughout the entire building and identifying signage. The interior space, mostly consisting of computer labs and office space on the second and third floors, can simultaneously be renovated to increase shared workspace through a more open floor plan, accommodating the needs of the EEIC and CEG. Reconfiguration of the first floor would allow for the Dean’s suite and student services center to be organized to meet functional needs. The research labs should be upgraded, focusing on creating flexible space that can be used for a wide variety of changing research needs in the future. The first floor lobby can also be improved by adding more user friendly seating encouraging students to collaborate. Individual chairs or small group worktables would better serve the lobby.

The Hitchcock Hall lobby has uncomfortable bench seating and students are frequently seen sitting on the floor instead of the benches. Comfortable lounge style seating will encourage students to gather before and after class.
Knowlton Hall

Summary

Knowlton Hall has an FCI score of 94.9% which makes it one of the newest buildings in the College of Engineering and in excellent condition. Knowlton Hall as a new building faces minor issues related to fine tuning the functionality to serve its purpose. Stakeholders requested more seating and gathering spots outside of classrooms. Other concerns raised by stakeholders were that the concrete walls all over the building make it seem sterile. Many professors noted the projection screen covers up the entire chalk board making it impossible to use both at the same time. With these small changes the usability and comfort of the building would be enhanced.

Recommendations

1. Improved Signage
   Priority: High

2. Improve Aesthetic Environment
   Priority: Low

3. Acoustic Improvements
   Priority: Medium

4. Writing Boards
   Priority: High

An example of what wall art can bring to Knowlton Hall. (5)
### Recommendation Details

#### 1. Improved Signage
- **Category:** Maintenance
- **Priority:** High
- **Estimated Cost:** TBD
- **Time Frame:** 1-5 years
- **General Summary:** Some consider Knowlton hall to be something akin to a maze, mainly due to the lack of internal signage and number of ramps. Staff have added a variety of impromptu signs directing people to the auditorium. And the studios on the third floor do not have a sign indicating their room number. Adding permanent signage to designate the various areas would be well received by first time visitors and KSA students, faculty and staff.

#### 2. Improve Aesthetic Environment
- **Category:** Maintenance
- **Priority:** Low
- **Estimated Cost:** $25,000
- **Time Frame:** 1-5 years
- **General Summary:** Knowlton Hall is perceived to be a sterile place given its unfinished look and concrete as the primary building material. Public art would add color and character to the building in a needed way. The large walls provide ample opportunity for murals, posters, or tapestries. This could provide a community building project for students throughout the KSA to work together to design wall treatments.

#### 3. Acoustic Improvements
- **Category:** Maintenance
- **Priority:** Medium
- **Estimated Cost:** TBD
- **Time Frame:** 5-10 years
- **General Summary:** Through observation and concerns expressed by stakeholders, the way sound travels through Knowlton Hall warrants attention. Not only can you hear what is happening on a specific floor from every other floor, large spaces such as the large central space on the ground level lack the ability to effectively host jury reviews due to the poor acoustic qualities. Changes such as adding walls enclosing the café would improve the acoustics.
4. Writing Boards

• Category: Maintenance
• Priority: High
• Estimated Cost: TBD
• Time Frame: 1-5 years
• General Summary: One of the common complaints present by the facility of Knowlton was that the projection screens in the classrooms were too large and did not allow them to use both the projector and the chalk/white board at the same time. Resizing the screens would be welcomed. Depending on room type, adding extra chalk boards on available walls is an alternative solution.

Creative wall art that can be a great community project.(6)

An aesthetic improvement to help solve the problem of seating. Creative solution for a building that houses creative majors.(7)
Koffolt and Fontana Labs are connected buildings housing Chemical and Biomolecular Engineering and Material Science and Engineering. Fontana Lab has an FCI score of 51.6%, while Koffolt Lab has an FCI score of 55, both indicating the need for significant renovation. Building users cited issues of leaking pipes and air conditioning units, as well as faulty heating and cooling systems. Further concerns include the presence of mold, asbestos and insects. Disability access is a concern. Bathrooms are small, and substandard, with restrooms for women not available on every floor. There is no public seating in the hallways, although the third floor houses a lounge for the use of students. The lounge is located behind a heavy metal door with no visibility to the rest of the building.

Based on stakeholder feedback and observations made during the assessment phase, a complete renovation is needed in order to make these buildings functional and able to accommodate the needs of faculty and staff.

**Recommendations**

1. **Complete Building Renovation**  
   Priority: High

---

Student Lounge Space: Although it provides an opportunity for students to relax, its location is not easily accessible.
1. Complete Building Renovation
   • Category: Physical change (Major renovation)
   • Priority: High
   • Estimated Cost: $47,000,000
   • Time Frame: 1-5 years
   • Summary: Some of the major issues are asbestos and mold in the ceiling, damaged ceilings and pipes, ongoing issues with the heating and cooling systems, as well as a lack of safety of the wiring connecting throughout the Fontana, Koffolt, McQuigg and Watts complex. In addition to properly functioning heating and cooling systems and electrical wiring, there should be sufficient soundproofing in certain labs that have machines that are very loud. More changes include, proper signage and room numbering for wayfinding, public seating or gathering spaces for students, and larger lab/office spaces for students and faculty, handrails for stairs outside, as well as ADA approved restrooms. The renovation should, if possible, include a student educational shared shop facility that can be used by students across the College. The renovation should focus on creating office space for Materials Science and Engineering faculty to allow for the vacating of Watts Hall. In addition, relocation of Biomedical Engineering into this renovation should be a high priority. As space permits, the inclusion of space for Aviation would be ideal to accommodate their growth needs.

The left photo is the current condition of office space, while the right photo is an example of what shared office space could potentially look like.\(^8\)
Watts Hall and MacQuigg Lab

Summary

Watts Hall and MacQuigg Lab are positioned at one of the key gateways into the North Academic core. The corner of College Avenue and Woodruff Avenue is one of the main access points into the Science and Technology Gateway. As part of the University’s Capital Needs Inventory, Watts Hall has been identified for renovation or replacement with an estimated cost of $14 million within a 10-20 year timeline. MacQuigg Laboratory, as part of the Capital Needs Inventory, has been identified to have a need for renovation at a cost of $31 million with an estimated timeline of 5-10 years. MacQuigg Lab and Watts Hall have among the lowest Facilities Condition Index scores at 48.9% and 44.2% respectively. Data gathered during the assessment process, along with comments from stakeholders lead to the recommendation that both buildings be demolished and replaced. The Materials Science and Engineering faculty are unanimous in their support for the replacement of both buildings.

Recommendations

1. Demolition of current buildings
   Priority: High

2. Redevelopment
   Priority: High

3. College Avenue/Woodruff Avenue CoE Gateway Entrance
   Priority: Medium
1. Demolition of current buildings
   • Category: Physical change (Major renovation)
   • Priority: High
   • Time frame: within 5-10 years
   • Estimated demolition cost: $1,990,000

2. Redevelopment
   • Category: New Construction
   • Priority: High
   • Time frame: 10-15 years
   • Estimated construction cost: $97 million
   • Summary: Following the demolition of both Watts Hall and MacQuigg Lab there will be a need for space to accommodate Materials Science and Engineering. In concert with Arts and Sciences long range plans for redevelopment along College Avenue, the redevelopment of the corner of College and Woodruff offers the opportunity to create a grand welcome to the Science and Technology Gateway along Woodruff and to a new Materials Corridor along College Avenue. The design of the new gateway building would incorporate a mix of materials, highlighting innovation in materials research. The new building would house the Materials Science and Engineering program, with the possibility of collaborative space with Arts and Sciences and other materials faculty on campus. The research lab space would be designed to encourage collaboration. The building would also house a student activities center, which would include a café and social spaces for students to interact in the northeastern corner of the building.

3. College Avenue/Woodruff Avenue CoE Gateway Entrance
   • Category: Physical change (Major change)
   • Priority: Medium
   • Time frame: 10-15 years
   • Estimated construction cost: $500,000
   • Summary: The creation of a noticeable entrance way into the College of Engineering will help to leave an impression on those visiting the gateway.
The new MacWatts Hall would house the Materials Science and Engineering program, with the possibility of collaborative space with Arts and Sciences and other materials faculty on campus.
Scott Laboratory is one of the newest buildings in the College of Engineering. The structural elements of Scott Laboratory include concrete and steel with prefinished aluminum cladding, steel wall panels, and brick. The data collected during the Facilities Assessment phase indicate that most stakeholders agree that they would like to see the style and function of Scott Lab materials incorporated into other buildings in the College of Engineering. However, minor improvements to make the building even more appealing to faculty and students were suggested. The key concerns raised by stakeholders and from observation include minor improvements to the interior and exterior spaces to maximize the building’s usability.

Recommendations

1. Improvements to interior
   Priority: Medium

2. Improvements to exterior
   Priority: Medium

(Left) Present style of chair in classrooms, which are mostly broken, uncomfortable, and very noisy. (Right) The proposed style of chair for the classrooms will not only allow for a much more conducive learning environment because they will be more comfortable, but they also allow for the present style of table to be utilized.
Recommendation Details

1. Interior Upgrades
   • Category: Maintenance
   • Priority: Medium
   • Estimated Cost: $15,000
   • Time Frame: 0-5 years
   • Summary: There are a number of minor interior improvements that would increase the usability and comfort of students, staff, and faculty. The attached chairs in the east wing classrooms squeak loudly and are uncomfortable and should be replaced. The north, east, and west building numbering system is confusing. Increasing wayfinding signage would aid in students finding their way to classes. There is a comfortable lounge for MAE students in the north building. Adding seating in the main lobby of the east building would increase comfort of students and visitors.

2. Exterior Upgrades
   • Category: Maintenance
   • Priority: Medium
   • Estimated Cost: $30,000
   • Time Frame: 0-5 years
   • Summary: There are a number of minor exterior improvements that would improve the experience for students, staff, and faculty. There is inadequate bicycle parking with the bike racks consistently full. Installing more bicycle racks would ensure students, faculty, and staff could find a convenient bicycle parking location near Scott Lab. The outdoor seating is frequently used by students, staff, and faculty for lunch and breaks and at times is entirely full on nice days. Adding more outdoor seating would encourage people to enjoy the green space. Adding to the appeal of the green space could be interactive engineering art. This art would encourage people to touch, feel, and see how the art piece works.
(Top) Current main entrance space. (Bottom) Proposed rendered installation of seating/gathering space in main entrance area to create social space to accommodate interaction.
Smith Laboratory

Recommendations

1. Entrance renovation
   Priority: Medium

2. Aesthetic changes
   Priority: Medium

3. Wayfinding and Comfort
   Priority: Medium

Summary

Smith Lab is located in the center of the North Academic Core and is shared between the Colleges of Engineering and Arts and Sciences. The FCI score for Smith Lab is 72.2% which indicates the need for some renovations to improve the overall appearance and quality of the building. A series of renovations are currently underway in Smith Lab including a two story student lounge and study space, along with HVAC renovations. Based on comments from stakeholders, along with data gathered renovations are principally focused on aesthetic renovations until such time as a full renovation is possible.

Smith Laboratory

The side alley of Smith is a well traveled and popular pedestrian path to gain access to Smith. An indistinct access way, improvements such as distinctive pavers and flush curbing would create a sense of direction, safety and purpose for pedestrians. By also adding public seating and an awning, the alley would become a destination and point of reference for students. 

(10)
Recommendation Details

1. Entrance renovation
   • Category: Physical change (Major renovation)
   • Priority: Medium
   • Time frame: 10-15 years
   • Estimated cost: $230,000
   • Summary: The purpose of this renovation is to create a noticeable main entrance into Smith Laboratory. Comments suggest that the building lacks a “defining” entrance. The implementation of a main entrance on the east, plaza side of the building will improve the ability to wayfind within the building.

2. Aesthetic changes
   • Category: Maintenance
   • Priority: Medium
   • Time frame: 10-15 years
   • Estimated cost: $955,000
   • Summary: Renovations would include replacing ceiling tiles throughout the building and changing the interior paint. These changes would improve the overall appeal and appearance of the building.

3. Wayfinding and Comfort
   • Category: Renovation
   • Priority: Medium
   • Time frame: 0-5 years
   • Estimated cost: $17,500
   • Summary: The building lacks seating throughout the hallways. The two floor student space will help improve this issue, but there is still a need for seating to accommodate the needs of students between classes. Wayfinding throughout the building seems to be an issue among those who were surveyed throughout the assessment phase of the planning process. The creation of better signage may be a short term solution to the problem, although long term renovations may need consideration.
Existing Smith Greenway space. (bottom) Proposed improvements to the Smith Greenway as part of the overall proposed Greenway Plan. (top)

Inspired by the Oval (top right), possible improvements for the Smith Greenway are shown. Key elements are pedestrian pathways, a dedicated bike lane and ample seating.
The costs presented in this report are derived from a fiscal model that evaluates renovation and construction costs. The buildings and rooms surveyed in our initial assessment report were given a renovation value by examining previous College of Engineering projects. A total cost was assigned to each proposed renovation based cost per square foot and room type. Additionally, a soft cost of 30% was applied to each proposal for items such as A/E services, contingencies, and permits.

The unique proposal costs are based on examining similar construction projects across Ohio State University. The main type of projects examined were recent renovations, new builds, and street rebuilds. Street network pricing examined the total linear footage for each alternative and multiplied the total by $4,000 per linear foot. Outside research was factored into a cost when a previous Ohio State project was not adequate enough for accurate estimation. After the total costs for the proposed renovations were complete, the proposed renovations were prioritized into high and medium priorities based on various findings in the initial assessments of each building and from the renovation reports. Priority was included under each renovation description and price.

<table>
<thead>
<tr>
<th>Building</th>
<th>Renovation</th>
<th>Construction</th>
<th>Maintenance</th>
<th>Demolition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolz</td>
<td>Building Renovation - $32,800,000</td>
<td>HVAC/Wiring - $1,000,000</td>
<td>Network Drops - $20,000</td>
<td>Lounge - $28,000</td>
<td>$1,048,000</td>
</tr>
<tr>
<td>Baker Systems</td>
<td>Main Lobby - $30,000</td>
<td>HVAC - $400,000</td>
<td></td>
<td></td>
<td>$400,000</td>
</tr>
<tr>
<td>Caldwell</td>
<td>Hallway - $25,000</td>
<td>HVAC - $400,000</td>
<td></td>
<td></td>
<td>$400,000</td>
</tr>
<tr>
<td>Dreese</td>
<td>Main Lobby - $50,000</td>
<td>Roof Replacement - $870,000</td>
<td></td>
<td></td>
<td>$870,000</td>
</tr>
<tr>
<td>Hitchcock</td>
<td>Complete Renovation - $29,000,000</td>
<td>Acoustic Engineering - TBD</td>
<td></td>
<td></td>
<td>TBD</td>
</tr>
<tr>
<td>Knowlton</td>
<td>Wayfinding - $1,000</td>
<td>Aesthetic Changes - $944,000</td>
<td></td>
<td></td>
<td>$989,000</td>
</tr>
<tr>
<td>MacQuigg/Watts</td>
<td>Entrance Renovation - $230,000</td>
<td>Replacement - $97,000,000</td>
<td></td>
<td>Demo - $1,990,000</td>
<td>$98,990,000</td>
</tr>
<tr>
<td>Scott</td>
<td>Seating - $150,000</td>
<td>Exterior Seating/art - $30,000</td>
<td>Main Entrance Seating - $15,000</td>
<td></td>
<td>$165,000</td>
</tr>
<tr>
<td>Smith</td>
<td>Entrance Renovation - $230,000</td>
<td>Aesthetic Changes - $944,000</td>
<td></td>
<td></td>
<td>$1,202,500</td>
</tr>
<tr>
<td>Fontanna/Koffolt</td>
<td>Building Renovation - $47,000,000</td>
<td></td>
<td></td>
<td></td>
<td>$47,000,000</td>
</tr>
</tbody>
</table>

**Total Costs**

**High Priority**

$148,494,000

**Medium Priority**

$89,852,500

**Low Priority**

$238,346,500
Implementation

Under the umbrella principles of quality spaces, connectivity, community, growth, sustainability, and safety, a layered plan came together through the development of specific strategies and tactics that address each broad area. Phased implementation of these ideas will be key and allow for adjustments to be made along the way. The concepts of staggered implementation and less-capital intensive tactics were drawn from the Tactical Urbanism Salon and have become cornerstones of this particular plan.

Conservatively, the entire College of Engineering facilities plan can be implemented for about $250 million with the Neil Avenue extension, or $235 million without the extension. The fiscal analysis is based on recent renovations, new builds, and street rebuilds on campus, and is therefore based on current market realities. The projected time frame for a plan of this scope to be realized is estimated at 20 years.

The following is an overview of the expected implementation procedures for each principle and the underlying strategies and tactics:

1. Quality spaces across the College of Engineering will be accomplished by designing both buildings and outdoor landscapes that are unique, flexible, and modern.
   - **Woonerfs**: Apply the woonerf-style street concept within the internal road network of the North Academic Core, as described in the transportation portion of this report. Eighteenth Avenue is the first street slated in the plan for a woonerf rebuild. Specific tactics include designing the new streets with a mixture of softscape and hardscape materials and allowing for ad-hoc placement of benches, planters, and other aesthetic additions.
   - **Improved Facilities**: Renovate, demolish, and construct new buildings following the recommendations within the report. The implementation periods for the different projects vary, but all aim to promote an urban and modern feel in the North Academic Core.

2. Connectivity will be improved across campus by focusing on streetscapes, internal and external networks, and accommodation of multi-modal transportation.
   - **Street rebuilds**: Recommended street rebuilds include 18th Avenue, 19th Avenue, and the Neil Avenue extension to create shared use woonerfs with pavers, flush curbs, and limited access to automobile traffic.
   - **Bike Paths**: Foster a bicycle culture on the Ohio State campus by creating a new bike network with dedicated North-South bike lanes on College Avenue, Neil Avenue, and the proposed greenway.
• **Restricted Access**: Strategically limit vehicular access on West Woodruff Avenue and the internal campus streets to give precedence to pedestrians and cyclists. Bus service will also be altered by removing the stops on 19th Avenue and routing busses around the north campus periphery. This strategy can be implemented simultaneously with the street rebuilds.

3. Community can be fostered among College of Engineering constituents and the wider University by focusing on strategies that bring people together through the built environment.

  • **Branding**: Create a College of Engineering brand to provide students, faculty, and staff with a sense of belonging and identity during their daily activities. Improving physical signage for COE buildings and adding a “College of Engineering” emblem to Hitchcock will be the first step in establishing a unifying theme in the district.
  
  • **Social Spaces**: Many of the recommended building renovations in the report address the need for more internal social spaces. The first phase in implementing this strategy is to add furniture to existing spaces that have the potential to be transformed into study or social spaces, such as the lobbies of Scott Laboratory and Hitchcock Hall.

4. Growth and expansion are integral parts of the plan that focus on ways for the College of Engineering to thrive well into the future.

  • **Building Renovations**: The renovation plans for Bolz Hall, Hitchcock Hall, Caldwell Lab, Dreese Lab, and Baker Systems reflect on strategic growth theories to create state-of-the-art facilities ideal for attracting the best students and faculty. Renovations are often favored in the plan over demolition and new construction to take advantage of existing infrastructure and the current campus layout.
  
  • **Fiscal Responsibility**: The manageable price tag on the Facilities Master Plan promotes fiscal responsibility within the College. This is an important element for ensuring that the facilities and engineering programs can persist into the future, within budget, and provide for many generations of students and researchers.

5. Sustainability is a top priority for the College of Engineering as a budgetary control, to ensure that the college is housed in high-quality buildings, and to care for the environment.

  • **LEED Certification**: The University will strive for sustainable design and LEED certification for campus buildings by encouraging all new construction and renovations to achieve LEED standards.
**Green Space**: Maintaining and expanding current green space places emphasis on being respectful stewards of our environment at Ohio State while also alleviating some of the cramped spatial concerns that come with urban campuses.

6. Safety is important both in actuality and in perception on a college campus. Achievement of this principle relies on strategies that meet the most basic needs of all people on campus – the ability to travel from place to place safely and without fear.

- **Network Design**: Construct a safe campus environment through quality road networks that slow all modes of transportation and specifically cater to pedestrians. Traditional measures of safety, such as emergency vehicle access, are also incorporated into the plan.

- **Infrastructure**: Install proper signage and signals at crosswalks to increase pedestrian awareness, particularly on West Woodruff Avenue. A focus on pedestrian lighting along internal streets and the proposed North-South greenway will diminish students’ fear of walking at night.
Conclusion

After a detailed data collection process, intensive benchmarking, observational studies, thorough stakeholder engagement, and the creation of numerous physical renderings, the College of Engineering Facilities Master Plan studio proudly presents this conceptual report to the college and Ohio State. The report and comprehensive plan serve as a valuable tool for the University in moving forward with implementation of the One Framework Plan, giving particular guidance in shaping the future of the North Academic Core and College of Engineering (COE) district.

The success of the Facilities Master Plan studio can be measured by the final review and studio showdown. The studio took first place at the showdown event, sweeping most of the individual categories. The client presentation was impressive as well, and College of Engineering Dean David Williams was among the reviewers. Both events were further testaments to the studio members’ professionalism and the practicality of the proposed College of Engineering Facilities Master Plan.
References

(2) Payton Chung Photo. thestar.com
(3) Brick Road: Civil Engineering Photos. ceephotos.karcor.com
   Paper Clip Bike Rack: joindes.com
   Woonerf Sign: Payton Chung Photo. thestar.com
   Couple Walking Dog: myrebody.com image sourced blogs.inlandsocal.com
   Girl on Bike/Pedestrian: Gettyimages/the image bank (via bicycling.about.com)
   Popup Cafe: Michael Drury. transportationnation.org
   Permeable Paving: good2golawncare.com (also used for Bolz Corner)
   Crab Apple Tree: greenhouseplants.com/ushostmaster.com
   Pink Flowering Trees: http://www.1zoom.net/big2/824/309584-frederika.jpg
   People Walking (background): tofuphotography.blogspot.com
(4) http://www.kahlerslater.com/expertise/culture-communications/millercoors
(5) http://www.unusual-travel-destinations.com/full-wall-mural.html
(6) http://www.moillusions.com/2008/03/painted-electric-boxes-illusion.html
(8) http://miami-coworking-offices.blogspot.com/
(10) Pedestrian Permeable Pavers: pathwaycafe.com
    Sintra Portuguese Pavement: sidewalkcity.wordpress.com
    “Ice Jam” Public Seating: Cameronvandyke.com (I really like this, I may use them in some more renderings)
    Glass Awning: Chartley Lean To woodpecker-joinery.co.uk