

## EXECUTIVE SUMMARY



*Perspective Rendering of New Engineering Buildings along College Avenue*

# 1

*The Master Plan provides a long-term vision and framework for growth, renewal, and transformation of two key precincts of the University Park campus at Penn State – West Campus and Core Campus.*

## GOALS OF THE MASTER PLAN

In March 2018, Penn State engaged Payette to develop a Master Plan for the College of Engineering (COE). The main goal of this effort was to define an actionable strategy, spanning two 5-year funding cycles (2018-2023 and 2023-2028), to provide a framework for capital projects to support the College of Engineering's strategic plan. The anticipated capital investment by the University is intended to increase the quantity and improve the quality of the COE's physical space and optimize the distribution and organization of its departments and programs, to support the realization of the College's academic vision as articulated in the Unit Strategic Plan: <https://www.engr.psu.edu/strategic-plan/index.aspx>

The University identified two campus sites as major opportunities for development:

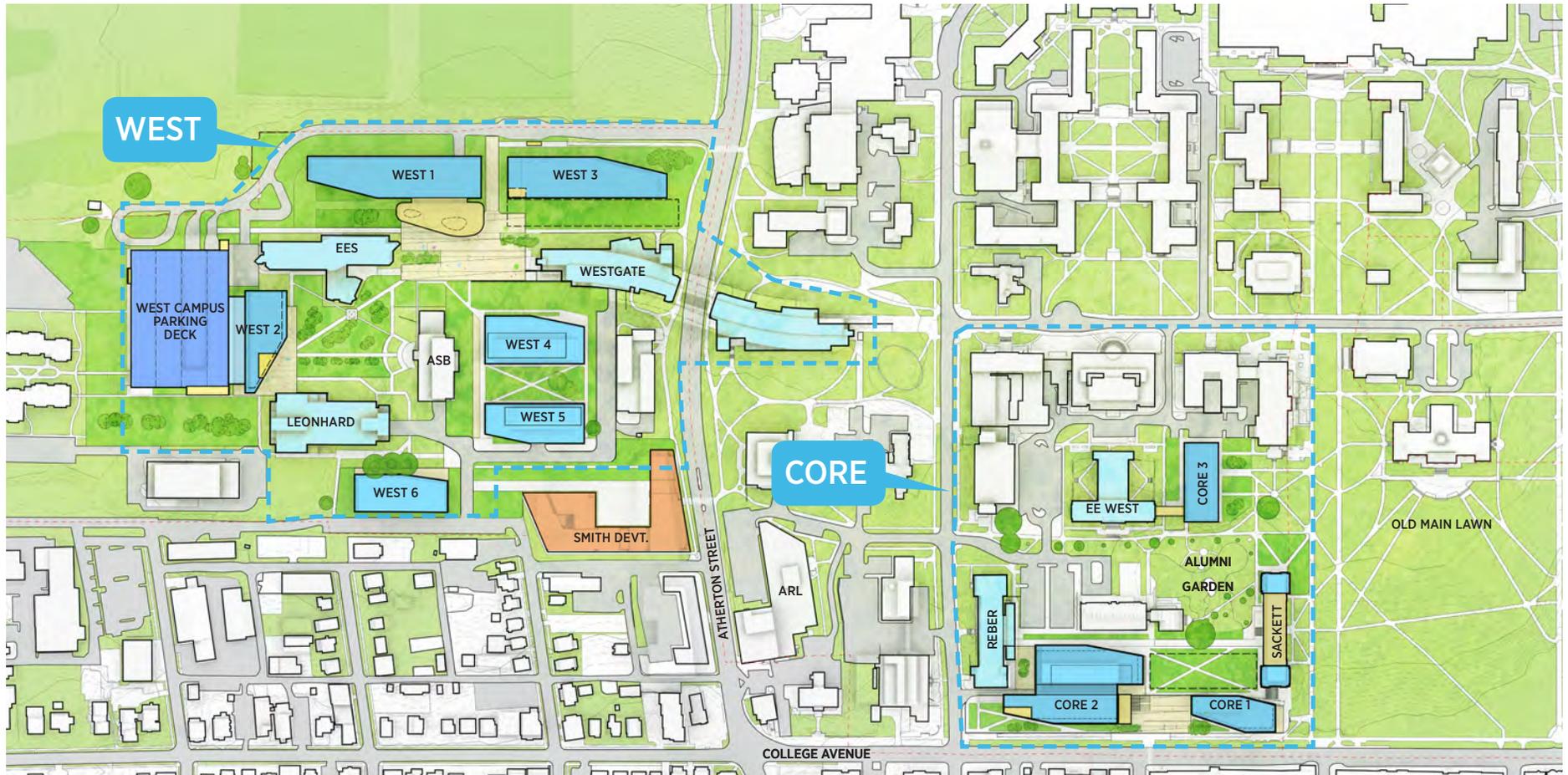
- **Site 1:** West Campus: considering the entire precinct and including the development of available building sites currently used as surface parking lots;
- **Site 2:** Core Campus: also known as the Core Engineering Sub-Campus, focusing primarily on the existing sites of Hammond, Sackett and the Engineering Units, adjacent buildings and open spaces.

The scope of the Master Plan focused on two major strands, which were to be carried out in parallel and in close coordination with each other:

- Programmatic analysis of the COE's current and future states, and projection of programmatic strategies and associated space needs for the College of Engineering for the next 10 years.
- Actionable physical plan for the near-term and long-term development of the West Campus and the transformation of the Core Campus through identification of opportunities for new buildings, renovation of existing buildings, campus infrastructure and systems, and the improvement and creation of major campus spaces.

The goals of the Master Plan are:

- Outline current and future space needs for the COE.
- Realize West Campus's potential to be a vibrant part of the Penn State campus fabric.
- Transform the COE's Core Campus while respecting its historic location near Pattee Mall and Old Main and addressing the campus edge along College Avenue.
- Determine the highest and best use of existing facilities and opportunities for redeveloping existing sites with the underlying goal of reducing the cost of maintenance and repair work needed to maintain the University's aging building inventory.
- Develop a plan that supports the COE departments and interdisciplinary thematic research.
- Strengthen the physical connectivity between COE's two principal precincts.



Illustrated Master Plan—Long-Term Framework



- FUTURE COE BUILDINGS
- EXISTING COE BUILDINGS
- EXISTING COE BUILDING TO BE RENOVATED
- POSSIBLE FUTURE BUILDING

## COE GROWTH AND SPACE DEMAND

Since 2008, the College of Engineering's undergraduate population has increased by 43%, and the graduate population increased by 7%. During this period, the tenure track faculty have grown by 10%, with additional growth in 2018, bringing the overall faculty growth to 20%. The COE has effectively added no assignable space to their inventory during this period of growth, though the new Chemical and Biological Engineering Building (CBEB), opening in 2019, will address some of the pent-up demand.

In the next ten years, the College of Engineering anticipates 26% growth in its FTE population, with an increased graduation rate of 700 undergraduate and 1,500 graduate degrees per year. The COE is also introducing a new policy of admissions after the freshman year which implies not only an emphasis on college-wide first-year and second-year experiences, but also commensurate demand for tenure track faculty and administrators.

The projected population growth stems from the factors above as well as the COE's desire to rebalance the graduate student-to-faculty ratio to be competitive with its peers. The College is aiming for an overall graduate student-to-faculty ratio of 8:1, and a 6:1 grad-to-faculty ratio in research labs. Rebalancing these ratios will enhance the COE's ranking, which is a key goal of the College's Strategic Plan.

The growth in the headcounts (both historic and projected) creates a corresponding demand for growth in physical space to support the goals of the College.

### 10 YEAR COE GROWTH PROJECTIONS

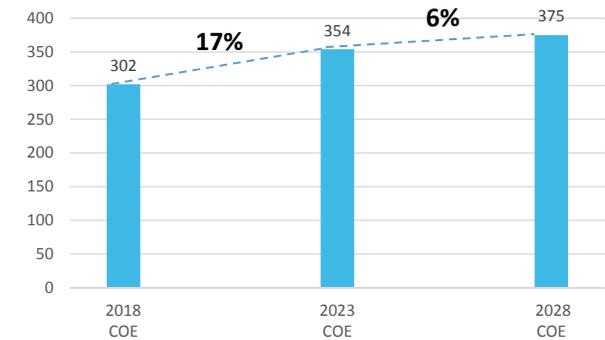
	2018 COE	2023 COE	2028 COE
TTF Faculty	302	354	375
All Faculty	410	497	520
FTE	847	1,014	1,072
*Graduate Students (MX + PhD)	1,547	2,903	3,075
Lab Seats	1,547	1,959	2,075

*\*MX refers to both MS and MEng students*

Currently (Fall 2018) the COE occupies approximately 715,000 assignable square feet (ASF) in more than 31 buildings, both across and off of the University Park campus.\* Using projections based on benchmarking of similar institutions and with reference to Penn State space standards, the current "right-sized" space demand for the College of Engineering is 810,00 ASF, indicating that the COE currently does not have sufficient space, by a factor of 13%. When growth is also considered, the projections suggest a total idealized demand for approximately 960,000 ASF by 2028; yielding a need to increase the COE space inventory by about 250,000 ASF (34%). This projected growth occurs in three main areas: research and office space growth to support the headcount growth, and growth in student space to support the inclusion of robust student collaboration space in all COE buildings.

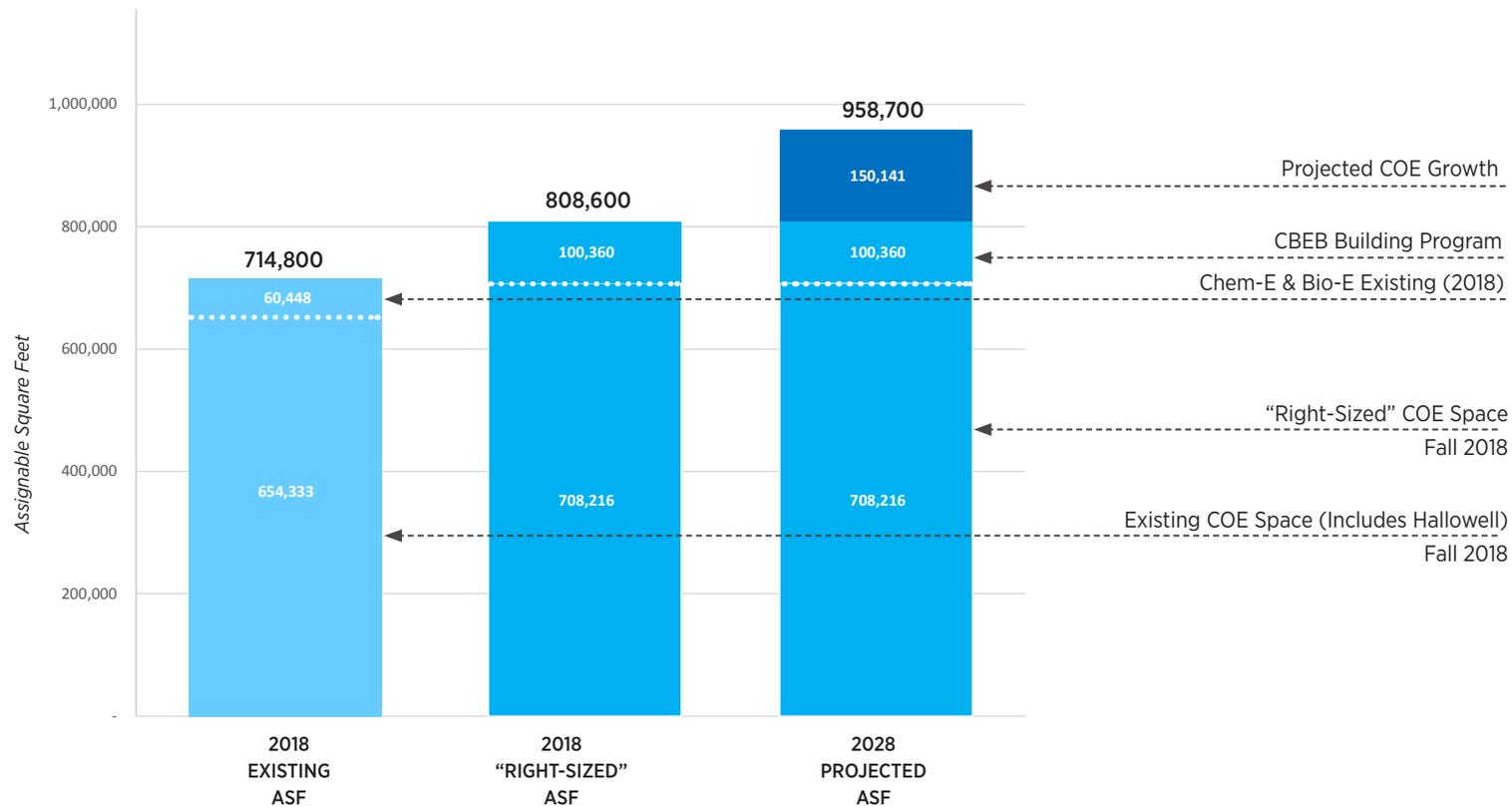
*\* This figure does not include the planned growth in the CBEB or the Agricultural Engineering departmental space.*

### TENURE TRACK FACULTY GROWTH



Another feature of the COE space demand is the desire to not only grow programs on the Core and West Campus, but also to consolidate some research spaces from off-campus locations back to main campus (e.g., Civil Engineering labs in the North American Refractories Building in Cato Park). More detail on the assumptions and calculations for growth on the Core and West Campus is provided in Chapter 3: Growth Projections.

COE SPACE DEMAND GRAPH



## EXISTING CONDITIONS

**Buildings:** The COE occupies space in 14 buildings on the Core and West Campuses, and these buildings range from excellent to poor in terms of their overall condition and their ability to meet the needs of their occupants. The worst-performing buildings in the portfolio are: Hammond; Engineering Units A, B, and C; the Kunkle Lounge; and the mid-century additions to the original Sackett Building (North and South Wings). The best-performing buildings are the most recent constructions, including Westgate, Leonhard and Earth and Engineering Sciences on the West Campus. The remaining buildings in the portfolio are in adequate condition, though many would benefit from upgrades to improve building systems, accessibility, building envelopes, finishes, and insertions of student space. These buildings include: Research West, Hollowell, Engineering Services, Reber, Electrical Engineering West and Electrical Engineering East.

**Site and Landscape:** Today, the Core Campus precinct includes significant open spaces such as Obelisk Garden, Alumni Garden, and Foundry Park. However, these spaces lack adequate spatial continuity with the rest of the campus and the town. A critical challenge is the wall created by the Hammond, Kunkle, and Sackett Complex effectively prevents a natural flow of pedestrians into and through these spaces without navigating the outdoor staircase through Hammond, a pinch point, or circulating through the service drive “moat” behind the Hammond and Sackett Buildings.

On West Campus, the primary open campus spaces feel empty and devoid of student life and are not properly programmed. The design of the exterior spaces—and the location of building entries and pathways—do not have the same quality of other spaces on the Penn State campus.

There are a number of reasons for this: activating elements—such as building entries, cafés, and student study spaces—do not face onto landscaped campus open spaces. In addition, the precinct is lacking mature trees and carefully crafted landscape elements. Compounding these issues, many of the commonly used pathways are not through the quads and pathways, but instead pass through parking lots and past loading docks and service entrances to buildings.

There are two primary pathways linking these two precincts—the north pathway is across the Westgate Pedestrian Bridge, and while this pathway is well travelled, it terminates on West Campus in an uncelebrated intersection of concrete pathways adjacent to flat planes of grass without site amenities or plantings that would signal arrival at an important place on the West Campus.

The south pathway between the Core and West Campuses follows a natural desire line linking Core Campus with several buildings on West Campus, including Leonhard, Hollowell, Applied Sciences Building, and the Engineering Services Building. This path runs along Steam Drive and Railroad Avenue, traversing Atherton Street, a four-lane state highway, at an on-demand signal. As it runs towards the West, the path becomes a series of parking lots and the north portion of Barnard Street. This condition is less than ideal for a safe and effective flow of pedestrian traffic will require attention, including the need for a more clearly delineated campus walk and associated improvements to landscape, lighting and signage.

### Utilities

**Core Campus:** Existing infrastructure, both active and abandoned, snakes into and around the buildings. Careful planning for the replacement of aging infrastructure and tying into existing systems is a key element in the success of the transformation of the Core Campus. Critical deflections have been noted in the 48” CMP storm line that runs immediately north of the Sackett building, so the state of this pipe should be considered when demolishing or using heavy equipment in this area.

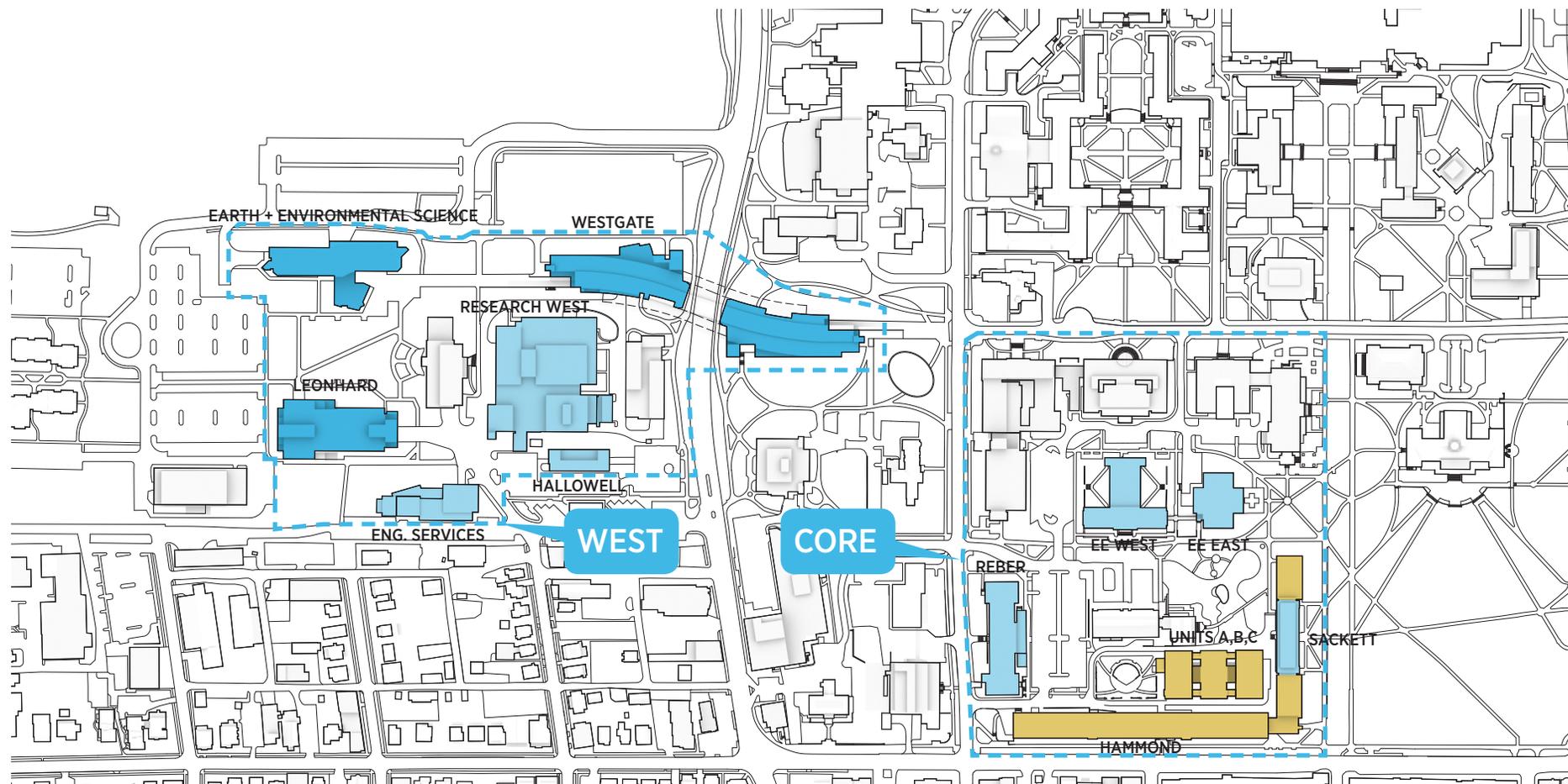
**West Campus:** Development in the West Campus is generally more recent and is less dense as compared to the Core Campus. Some of the utilities are bundled into utility corridors and, as more development occurs on the West Campus, it is recommended to continue to develop additional utility corridors under campus pathways where possible.

### Stormwater

**Core Campus:** The main stormwater collection pipe along College Avenue that drains the Main Campus is undersized and causes flooding. Future development of the site requires sub-surface stormwater detention to mitigate the current and proposed stormwater demand.

**West Campus:** There are significant, existing stormwater run-off problems causing flooding on a regular basis on the West Campus and Atherton Street. The University has a policy that no new impervious areas can be built on the West Campus until these stormwater and flooding problems are addressed with sub-surface stormwater detention facilities.

*See Chapters 2 and 5 for more detail on utilities and stormwater.*



COE Buildings on the Core and West Campus Assessed: Quality and Adequacy

## MASTER PLAN VISION

**The Master Plan** defines a comprehensive capital improvement plan for the University and the College of Engineering, establishing a vision for the development of the West Campus and Core Campus precincts. The Plan's implementation is organized in three phases:

**Phase 1** consists of a series of capital projects that can be implemented within the \$370M budget approved by the University for the funding cycle 2018-2023. This phase includes new building construction, demolition, renovations, infrastructure, and campus landscape design. Phase 1 is also intended to reduce the backlog of deferred maintenance, especially associated with Hammond, Sackett and the Engineering Units. In total, Phase 1 consists of the demolition of 304,000 GSF in the Sackett Wings, Kunkle, Engineering Units A, B, C and Hammond; the addition of 393,000 GSF of new construction with the building of West 1, West 2 and a new north addition to the Sackett Building. Also in Phase 1 is the renovation of 48,000 GSF in the historic Sackett Building on the Core Campus. The current capital plan is not intended to be a growth plan for COE, but to address approximately \$59M in maintenance backlog by demolishing Hammond, Engineering Units A, B, C, and the renovation of Sackett.

**Phase 2** consists of capital projects intended to provide additional space for the College of Engineering to meet its projected space needs identified for the overall 10-year horizon of the plan. Included in the 2023-2028 funding cycle, Phase 2 projects are provided as a list of opportunities, allowing the University flexibility in managing their precise scope and aligning them with various, yet-to-be-determined funding scenarios. In total, Phase 2 consists of 483,000 GSF in new construction in the buildings of West 3, Core 1, Core 2, the South Wing of Sackett, and the fit-out of 7,000 ASF of space within the North Wing of Sackett.

**Future** identifies a list of additional opportunities for major renovation or replacement of existing buildings, as well as associated campus improvements that could be achieved beyond the horizon of Phase 2. Part of the purpose of these future opportunities is to define an overall planning framework to situate Phase 1 and Phase 2, pointing to a long-term vision.

**Tactical Interventions** include a set of small-scale tactical projects within existing buildings and the existing campus landscape that complement the larger moves of the Master Plan. However, these will be funded outside of the budget defined by the Master Plan. These interventions are described in greater detail in Chapter 4.



## PHASE 1

*2018-2023 Capital Funding Cycle*

- West 1
- West 2
- Sackett Renovation and North Wing Addition (shelled)

## PHASE 2

*2023-2028 Capital Funding Cycle*

- Sackett South Wing Addition
- Core 1
- Core 2
- West 3

## FUTURE

*2028 and Beyond*

- EE East Replacement
- West 4, 5, and 6

## WEST CAMPUS

**A key goal** of the Master Plan is to establish a vibrant campus precinct on the West Campus. A major investment in the West Campus will transform the precinct into a campus district equal in quality to the best spaces on the University Park Campus. The Master Plan establishes a singular vision for this precinct that will allow the University to capitalize on this once-in-a-generation opportunity.

**Establishing Key Campus Spaces:** The West Campus precinct will feature two signature open spaces: the Plaza and the West Quad. These spaces will be framed and defined by four new buildings, West 1, West 2, West 3, and the West Campus Parking Deck, as well as by the existing buildings. West 1, West 2, and the parking deck are part of Phase 1, West 3 is part of Phase 2, and other West Campus buildings will be completed in future phases. Locating a new Plaza at the west terminus of the Westgate crossing is a critical driver of the Master Plan – this move strategically concentrates student activity and building access for West Campus as a way to reinforce and strengthen the Westgate crossing. Together with the student Hub in the West 1 Building, the Plaza will become a landmark destination and memorable campus space.

**West Campus Programs:** On the West Campus, the COE will accommodate a range of programmatic needs, including research laboratories with significant levels of technical requirements; next generation teaching space; and associated support spaces for faculty, administration and students. The new space creates the opportunity to re-align research space into strategic thematic groupings and focus on the shared use of space to increase utilization at a significant scale that will change the culture of the College of Engineering for decades.



*West Campus Plaza and Student Hub, Looking West from the Westgate Ramp*

The development of the West Campus strategically addresses the maximization of building sites, funding allocated by DGS (Department of General Services) for Phase 1, and the thematic synergies of COE programs.

**Buildings:** Four large new buildings are planned for the West Campus. These buildings are sited on open space or existing on-grade parking lots and do not displace any existing buildings.

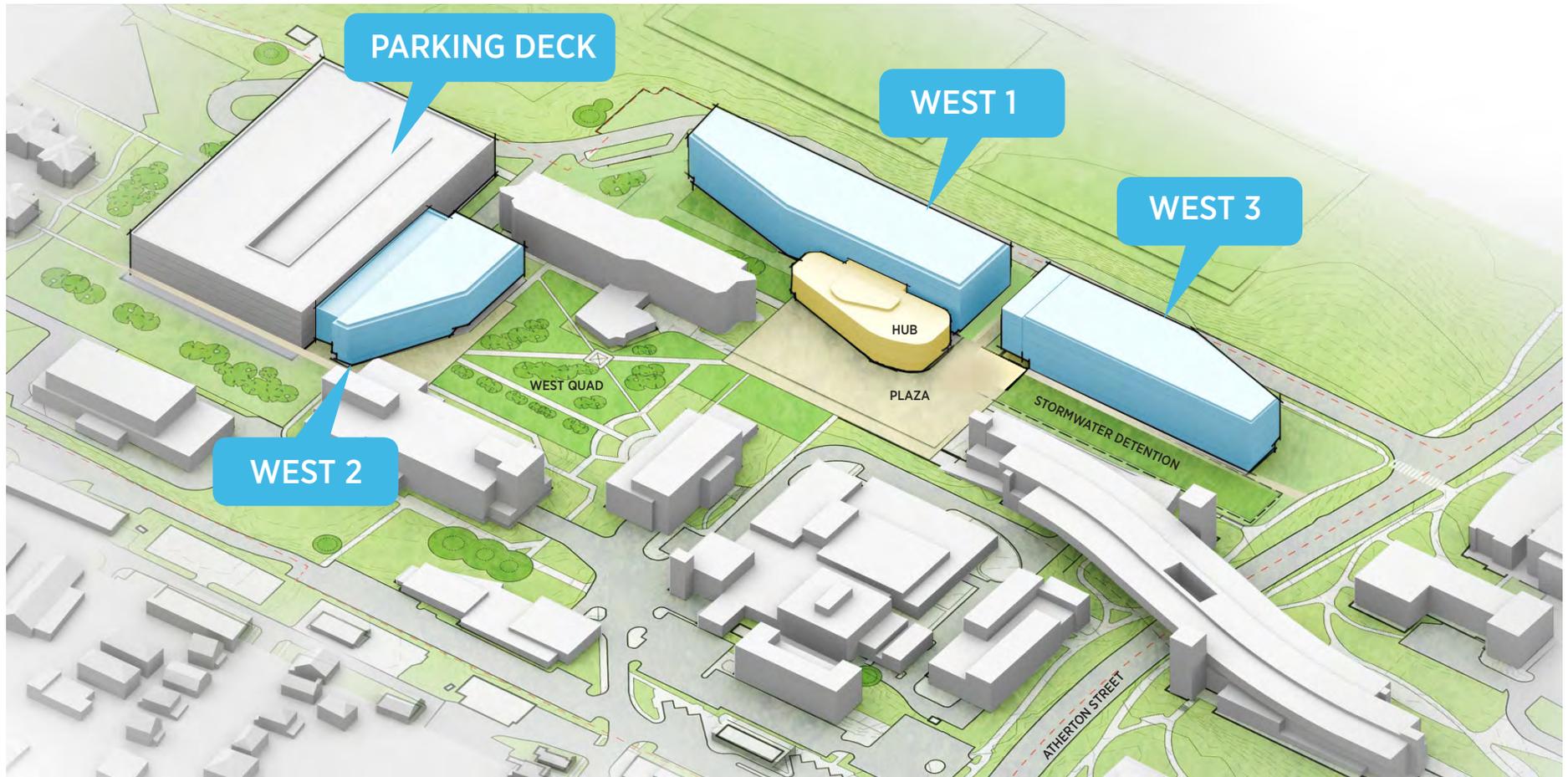
**West Parking Deck:** This 6-story, 1,670 space parking deck contains the terminus for the Red Link campus bus and is situated along the west edge of the precinct. The parking deck supports growth of the precinct and replaces the parking spaces lost to the new building sites. As such it is a key enabling project that supports a significant portion of the Master Plan.

**West 1:** 5-story, 279,000 GSF, research and teaching hub. The north bar of West 1 will be an interdisciplinary research engine, and the south wing, the “Hub,” will house a café, student social areas and general purpose classrooms. West 1 will occupy and define a new Plaza for West Campus at the terminus of the existing Westgate pedestrian ramp.

**West 2:** 4-story, 98,000 GSF, research and teaching hub. Located along the east façade of the parking deck, the building will include high bay research and teaching space. This core facility will serve as a programmatic magnet for teaching and research from a broad range of disciplines. The east façade of West 2 will create a beautiful destination at the western edge of the West Quad.

**West 3:** 5-story, 194,000 GSF research and teaching building. West 3 will provide a flexible, robust floorplate for growth in research and teaching programs. Its location east of West 1 allows for direct connections at the basement level as well as upper level bridges. The scope of this project will include the construction of a 1.5 acre-ft stormwater storage facility to the south of the building.

**Future Development Opportunities:** Beyond the four new buildings identified in this plan, the West Campus could be further enhanced and developed by replacing Research West, Hallowell, and the Engineering Services Building with larger, modern facilities that would enhance the quality of space and the landscape character in this precinct. With these future developments, the Master Plan recommends the major redesign of pedestrian and vehicular pathways, parking, and campus landscape enhancements for the campus areas south of Hallowell and Research West.



Isometric View of West Campus through Phase 2

## CORE CAMPUS

**The Master Plan** establishes a long-term vision for the Core Campus rooted in its existing assets: its historic structures (Sackett, Reber, and Electrical Engineering West) and the quality of the Alumni Garden landscape. At the same time, it sets in motion a radical transformation of the precinct based on renewal, redevelopment and community engagement.

The plan starts with the demolition and replacement of structures that no longer perform well and represent a high deferred maintenance liability: Hammond, Kunkle, Engineering Units, and the Sackett North and South Wings. The plan includes renovations and additions to the historic Sackett Building, two new campus buildings, and two new campus landscape spaces: the Engineering Green and the Engineering Plaza. New east-west openings will connect the new landscape spaces within the Precinct to Pattee Mall and Old Main Lawn. Importantly, the Precinct will present a new face to College Avenue and the downtown of State College. The relentless wall of the Hammond Building will be replaced by two smaller buildings and a large Plaza. This strategy will re-energize the engagement of the campus with the town and provide better connectivity for the entire campus north of the precinct to the amenities of downtown State College.

The plan for the Core Campus achieves the following:

- Provides new facilities and infrastructure to support the academic vision of the College of Engineering.
- Transforms the precinct by creating a new series of signature open spaces.
- Re-establishes connections between the precinct and the rest of the campus, and between the campus and the Borough.
- Brings new life to Sackett as a valuable historic structure that can serve the College and anchor the Core Campus precinct.
- Creates a new campus edge along College Ave. that is more vibrant and welcoming to the adjacent community.
- Removes old structures and addresses significant associated maintenance backlog.

**A Landscape-Driven Precinct:** The Core Campus precinct includes significant open spaces today, such as Obelisk Garden, Alumni Garden, and Foundry Park. This Master Plan envisions a placemaking strategy for this precinct that incorporates, integrates and enhances these assets, and proposes the addition of three new elements:

**Engineering Green:** This landscape space will sit in the core of the precinct, framed by Sackett to the east, Core 2 to the west, and Core 1 to the south. To the north it will be separated from the Alumni Garden by the Engineering Promenade. The Green will function as a part of the infrastructure, sitting atop a 1.9 acre-foot stormwater storage facility, which will be part of the Core 1 Building project. The full Engineering Green will necessitate the relocation of the existing Foundry Park.

**Engineering Promenade:** A new pedestrian path runs across the site in the east-west direction, connecting the east entrance of Reber to the west entrance of Sackett.

**Engineering Plaza:** The Plaza will be primarily a street-front amenity, a paved space adjacent to the city sidewalk. As such, it will provide a key point of contact between the campus and the town, a connection that has been missing for the past six decades.



*Core Campus (left), Looking East along College Avenue, at the End of Phase 2*

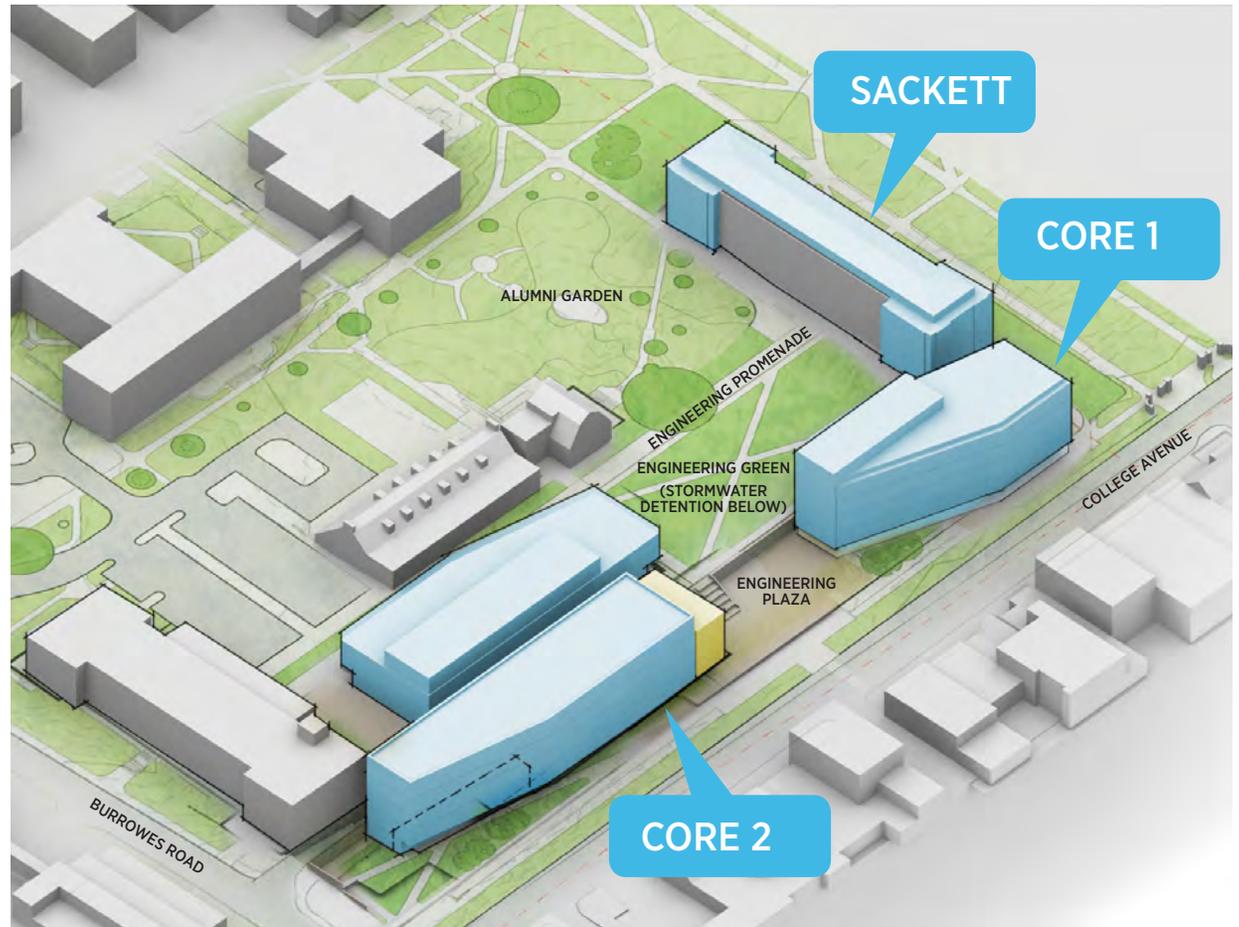
**New Precinct Buildings:** While the new buildings planned for this precinct take advantage of sites created by demolishing existing structures, they will not replace them one-to-one. New buildings are sited to frame and define key open spaces, as well as to maximize contiguous area for efficient and flexible floorplates.

**Core 1:** 5-story, 77,000 GSF academic building for the COE. Located on the key southeast corner of the precinct, facing Pattee Mall and College Avenue. This building will house offices, dry research and teaching functions, and general-purpose classrooms. It will face the new Engineering Green to the north, and College Avenue to the south. The Core 1 project will include the construction of the stormwater storage facility beneath the Engineering Green as well as associated sub-surface utilities.

**Core 2:** 4- and 5-story, 196,000 GSF academic building for the COE located on the southwest corner of the precinct. On the west side, the building will provide a direct connection to the adjacent Reber Building on the basement level. A central service and waste management area will be located here, accessed off Burrowes Road and serving multiple buildings. It will be important to articulate the composition of the 5-story College Avenue façade so that it creates an appropriate engagement with downtown while also avoiding today's opaque south face of Hammond.

**Sackett Renovation and Additions:** The Sackett Building will undergo a full gut renovation, including strategic improvements to its envelope and the replacement of the entire 4th floor and roof. The mid-century south and north wings will be replaced by two new symmetrical additions in keeping with the Klauder-designed original building. Significant site work, re-grading and utility infrastructure will be part of this multi-phase renewal of Sackett.

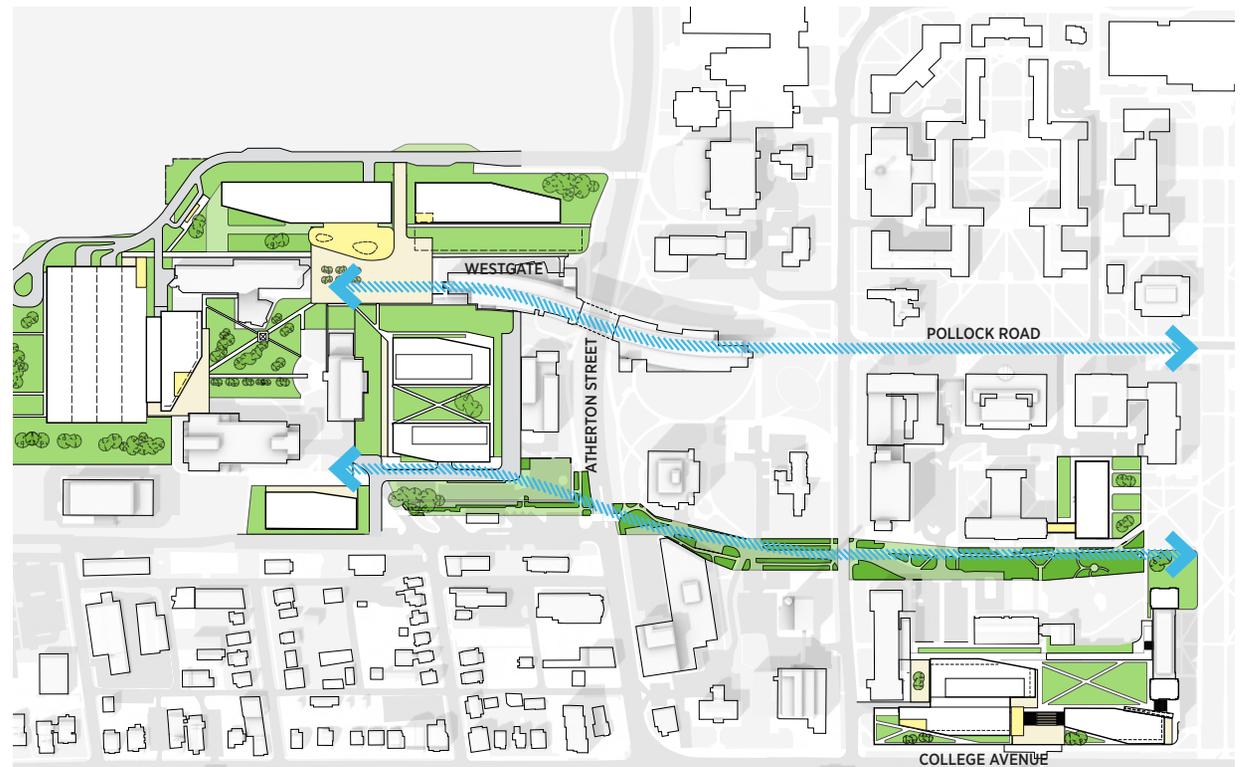
**Future Development Opportunities:** Additional development opportunities can be considered on the Core Campus, which will involve the replacement or renovation of existing structures, including Electrical Engineering East and potentially the ARL Building currently occupied by the Applied Research Laboratory. The ARL site provides an interesting site opportunity for providing a near-continuous COE presence from the Core Campus to the West Campus, given its location near the geographical midpoint, potentially overcoming the current tension between two centers of gravity.



Isometric View of Core Campus

## CONNECTION BETWEEN THE WEST CAMPUS AND CORE CAMPUS PRECINCTS

**A sense of cohesion** and identity for the College of Engineering will depend on a strong physical and functional continuity between the West Campus and the Core Campus precincts. Today, the formal pedestrian link between the two precincts is the Westgate pedestrian bridge. However, there is also pedestrian traffic that crosses Atherton at grade via the signalized crossing at Railroad Ave. To continue to encourage the safer connection using Westgate, the plan prioritizes construction of West 1, West 2 and West 3, located towards the north side of the West Campus Precinct. While it is expected that this will increase the preferred route, it is likely that the Railroad Avenue intersection will continue to be used, especially by those coming to and from the White Course Apartments, Leonhard, the Engineering Services Building, and other points west. This issue is likely to intensify once future development of the West Campus occurs on the south side of the precinct, including potential replacement of Research West. The Master Plan's long-term framework identifies a series of site and landscape improvements along the string of parking lots and sidewalks in order to enhance the safety of pedestrians and improve the walking experience.



*Campus Connectivity between the Core Campus and the West Campus through Phase 2*

## SUSTAINABILITY

**Penn State** has set aggressive goals of reducing campus greenhouse gases by 80% from 1990 levels by 2050. Over 80% of the campus greenhouse gas emissions for Penn State come from the operation of buildings, therefore the consideration of the environmental impact of design decisions made at the master plan level is critical to achieving these goals. During the COE Master Plan, a sustainability workshop was held to understand the vision. Two goals for the design of new buildings on the campus include:

- All new or renovated buildings will achieve LEED Certification
- Buildings should be designed to minimize energy use, and be as “near net-zero” as possible before the addition of renewables in order to support Penn State’s overall campus goals for reducing the carbon emissions of their buildings.

For the purpose of this analysis, net-zero energy was defined as the annual energy consumption being equal to the energy produced by renewables. The first step in achieving a net-zero buildings is to focus on reducing energy usage and loads as much as possible. This drive to very efficient buildings is the goal of projects discussed

in the master plan, with the understanding that renewable energy generation will be addressed at the campus scale, or on site in the future when the economic model may be different.

One of the challenges of studying energy for a master plan, is the range of variables that may still be under consideration at this stage. To address this uncertain nature, Payette conducted over 2,500 parametric energy simulations to study and understand different possible variable combinations—these simulations and their conclusions are discussed in Chapter 5.

### **Recommendation for Phase 1 Buildings:**

- West 2 should have the lowest energy use intensity, and the future potential to be as a net-zero building if energy use is minimized through strategies discussed above and the roof and adjacent parking garage of West 2 are covered in photovoltaics in the future.
- The front pavilion of West 1 could showcase state of the art energy efficiency strategies for high performance research space.

The generation of electricity on the parking deck or some other part of the buildings would need to be evaluated using life cycle cost analysis in order to justify the expense as part of these building projects against other energy reduction measures. If energy reduction measures prove better value these would be selected in preference to local generation. A selection of possible design measures shall be listed in Chapter 5.

**MASTER PLAN BUDGET—PHASES 1 & 2**

The cost estimates for Phase 1 and Phase 2 were developed to assist in the planning process. Phase 1 scope was planned to be funded by the \$370M budget. The following methodology was used to develop the estimates:

- New construction and renovation costs are estimated based on the benchmarked cost-per-SF basis in 2018 dollars and escalated at 4% per year from January 1, 2018, to the start date of construction for each project.
- More detailed cost estimating was conducted for the Sackett renovation and additions.
- Costs for site development were included based on a benchmarked cost-per-SF basis determined by the area and type of landscape anticipated.
- The estimates include detailed estimating of associated utility work and stormwater detention.
- The estimates utilize construction-cost-to-project-cost multipliers, developed in consultation with Penn State OPP, to arrive at total project cost.

More detailed information regarding these cost estimates can be found in Chapter 5 of this report.

**MASTER PLAN STEPS—PHASES 1 & 2**

Based on the long-term strategy and vision, the Master Plan details how this vision can be implemented in incremental steps over time and within the budget established for Penn State's 2018-2023 capital funding cycle.

\$370M	Phase 1 Budget
\$230.1M	West 1 + Landscape + Utilities
\$76.8M	West 2 + Landscape + Utilities
\$49.3M	Sackett Renovation + Shelled North Wing Addition + Landscape + Utilities
\$13.6M	Core Campus Demolition + Site Repair

\$479M	Phase 2 Budget
\$14.4M	Sackett South Wing Addition + North Wing Fit-out + Landscape
\$72.8M	Core 1
\$189.9M	Core 2
\$190.7M	West 3
\$10.8M	Utilities + Stormwater (combined)

**Phase 1:**

- Step 1: Complete West Campus Parking Deck
- Step 2: Complete West 2 Building and associated landscape
- Step 3: Complete West 1 Building and associated landscape
- Step 4: Decant Hammond, Sackett, Units to West 1 and West 2; temporarily swing remaining space from Sackett into Hammond
- Step 5: Demolish Units and Sackett North Wing; Start Sackett Renovation and North Wing Addition
- Step 6: Complete Sackett Renovation and Sackett North Wing Addition
- Step 7: Decant Programs from Hammond into Sackett and other swing space as needed
- Step 8: Demolish Hammond, Kunkle, and the South Wing of Sackett
- Step 9: Install temporary landscape on the Core Campus

**Phase 2:**

- Step 1: Complete South Wing of Sackett Building, Core 1 Building, Core 2 Building and associated landscape, utilities, and stormwater detention facility (If Step 1 is conceived of as two steps, completion of Sackett, Core 1 and the stormwater detention facility should come before Core 2)
- Step 2: Complete West 3 Building and associated landscape, utilities, and stormwater detention facility

**Alternative Possibilities:**

- In Phase 1, it may be possible to complete the South Wing of Sackett
- In Phase 2, West 3 could be built before the Core Campus development in order to accommodate the needs of the West 1 expansion

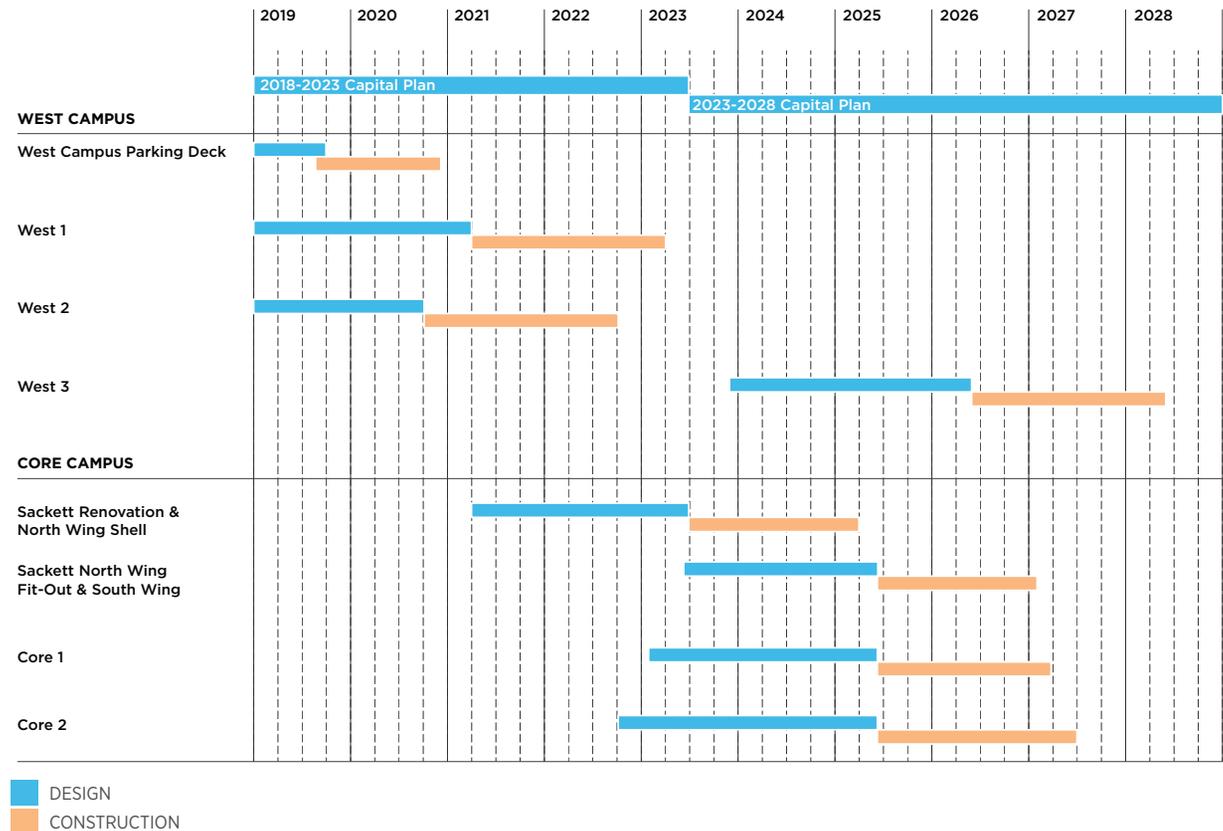
**MASTER PLAN SCHEDULE—PHASES 1 & 2**

A combined schedule for Phase 1 and Phase 2 is presented here. Timelines for design and construction were developed in consultation with Penn State Office of Physical Plant and incorporated Penn State’s processes for designer selection and Board of Trustees engagement and approvals. As noted in the earlier Phasing section above, the Master Plan recommends that Phase 2 work on Sackett, Core 1, and Core 2 proceed in parallel and as early as possible on the heels of the Phase 1 work on Sackett, so that the Core Campus can achieve a sense of completion, minimize the period of campus disruption, and heal the open scar along College Avenue, due to Hammond’s removal, as early as possible. A more detailed version of this schedule Can be found in Chapter 5.

**Detailed Programming Phase**

After the completion of the Master Plan, a separate detailed programming phase was undertaken by Penn State and Payette to better understand the programmatic needs and vision for Phase 1 (West 1, West 2 and Sackett) with more detail and specificity than the high level programming the Master Plan process achieved.

The findings from this detailed programming process are documented in the “April 2019, Phase 1 Programming Report”; and correct some of the programming assumptions made in the development of the Master Plan. Footnotes have been added to the Master Plan document in instances where the Master Plan programming has been superseded by the detailed programming document findings. The “April 2019, Phase 1 Programming Report”; was published under a separate cover.



It is recommended that at the start of Phase 2, a programming study should be undertaken to re-align the programming for the Phase 2 buildings with the final design and programming of Phase 1 (West 1, West 2 and Sackett) incorporating any new needs or strategic direction developed in Phase 1.