

# PURDUE UNIVERSITY WEST LAFAYETTE

Master Plan Report - February 2009

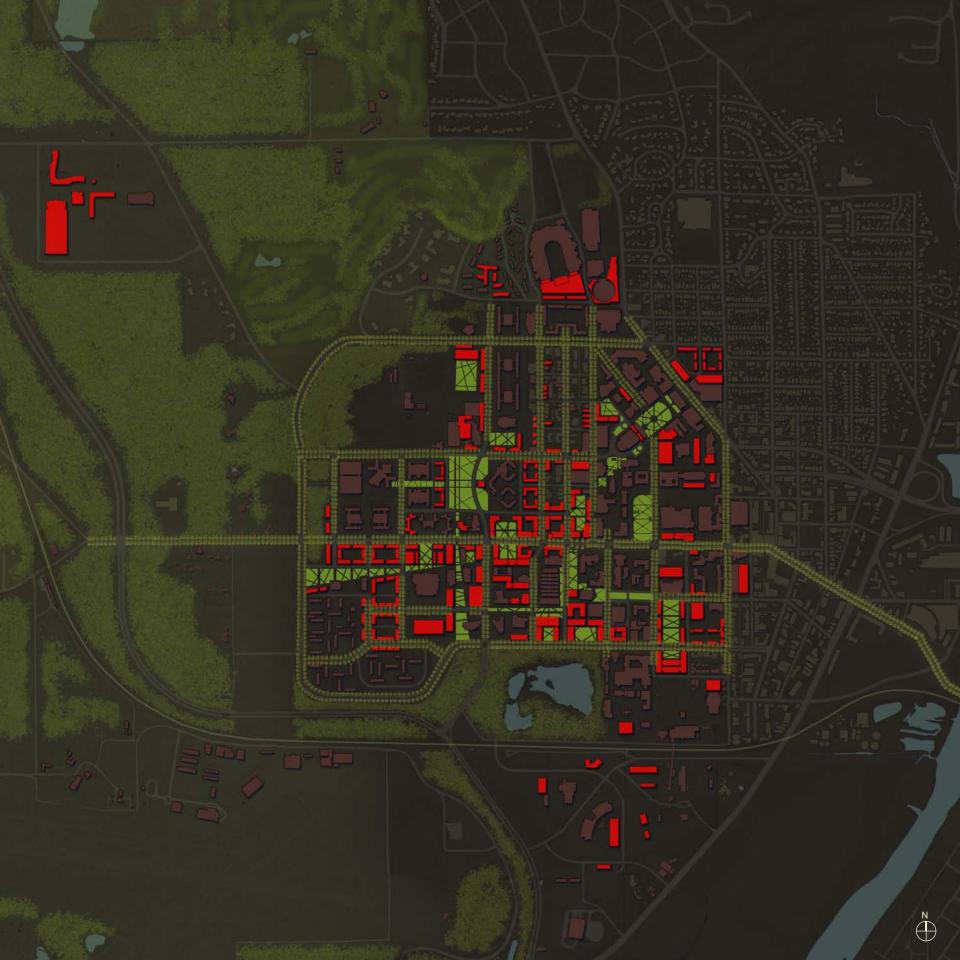




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## **EXECUTIVE SUMMARY**

Purdue University is a public land-grant institution in West Lafayette, Indiana. In recent years, the University has focused on collaborative research. Today, with a student population over 39,000 and more than 10,000 employees, Purdue University is the size of a moderate city, and is one of the nation's pre-eminent public institutions.

This Purdue University master plan is the result of a highly collaborative process. The University formed a broadly representative Master Planning Committee, and the bones of the plan resulted from energized work sessions, frequent discussions, and public meetings. Constituents provided continual feedback which greatly influenced the plan's development.

The resulting master plan is best understood as a physical expression of the University's new strategic plan, **New Synergies**. The campus environment envisioned by the master plan will ensure the realization of the goals and objectives established by **New Synergies**. In particular, the plan seeks to ensure that the people needed to further this vision, both those already on campus and potential new recruits, will be nurtured by their physical environment.

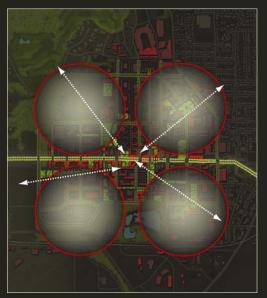
The vision represented in the master plan is grounded in a rigorous examination of existing conditions and available data sets conducted during an initial analysis phase. The key outcomes of the analysis are:

- The University has sufficient space within the existing campus bounds to accommodate future growth needs for the next twenty years and beyond.
- Research in the west and academic functions in the east must be re-integrated within a balanced residential context.
- The ecological benefits from preserving the University's western land holdings are significant, and argue strongly against continued westward sprawl
- Programmatically, the University has already crossed State Street, but the street currently divides the campus north and south. State Street must become a unifying feature at the heart of student and academic life. By diverting traffic from the center of campus, a perimeter parkway will allow for the transformation of State Street into a vibrant, connective, mixed-use corridor.
- The University's transportation needs are best met by a road network that promotes clarity and simplicity.
- Existing student residential populations are concentrated on the western edge of campus. Students not housed on campus are impacting what were formally family neighborhoods. Strategically creating new residential communities around the camps core, and enhancing existing communities would help the neighborhoods, improve the overall campus experience, and improve the town-gown relationship.
- The University should collaborate with the cities of West Lafayette and Lafayette, as well as with the County, to the benefit of all parties, discouraging car-driven suburban style sprawl, encouraging stable owner-occupied neighborhoods close to the University, and strategically directing rental housing and mixed-use development.

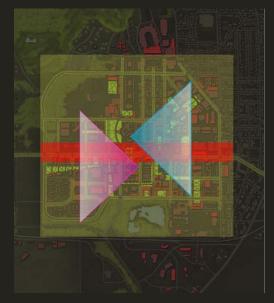
The master plan details building site opportunities, service access, infrastructure, and other specifics, but its core consists of five overarching principles resulting from the analysis and collaborative process. It is inevitable that the University will face unforeseeable decisions over the life of the plan. The core principles establish a flexible framework for decision making, one that will act as a reference guide when unexpected developments arise.



Principle 1: Promote compact growth within the existing campus



Principle 2: Establish State Street as a collaborative center



Principle 3: Create program synergies through strong mixeduse districts



Principle 4: Encourage a simple integrated transportation system with a Perimeter Parkway



Principle 5: Preserve the Western Lands





Safe P







## CONNECTIONS TO THE STRATEGIC PLAN

The Master Plan's attention to planning the future of the campus environment and appropriate facilities will ensure that the goals and objectives established by **New Synergies** may be fully attained and that the individuals needed to further them may be recruited and retained as members of the Purdue community.

While the University's strategic plan and the physical master plan were developed in parallel, the two documents actively reinforce one another. Both efforts were structured around broad topics which framed the key issues in analogous fashions. For the strategic plan, President France A. Córdova created white papers initiatives centered on several key areas. The strategic plan areas and master plan initiatives correspond as follows:

### Strategic Plan Initiatives < >> Master Plan Implementation

#### » Facilitating Collaboration

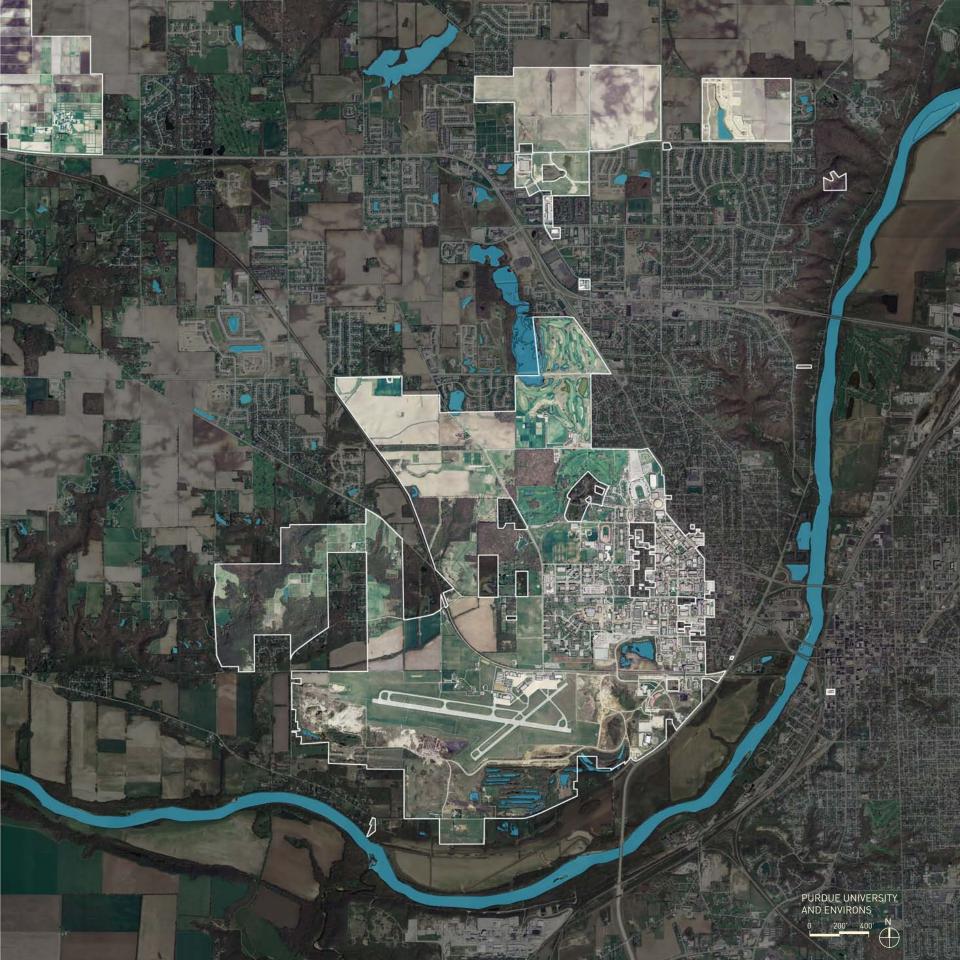
- · State Street as a unifying feature
- Creating a "corridor for collaboration" including appropriate facilities
- · Minimization of sprawl by concentrating campus activities to create a vibrant community
- » Creating a Living Laboratory
- Use of the campus physical environment for research, habitat and recreation purposes
- » Sustainability
- · Engagement of the environment
- · Encouraging environmental stewardship
- Quality of life considerations including enhancement of trail system
- » Fostering Community
- Collaboration of Purdue / West Lafayette communities
- Demystification of road systems
- » Student & Faculty Recruitment, Success, and Retention
- Enhancement of Purdue's sense of place
- Facilities and environment critical to creating positive first impression

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CAMPUS 1950'S ILLUSTRATING DEVELOPMENT OF HISTORIC BEAUX ARTS AXIS

### **CAMPUS TODAY**

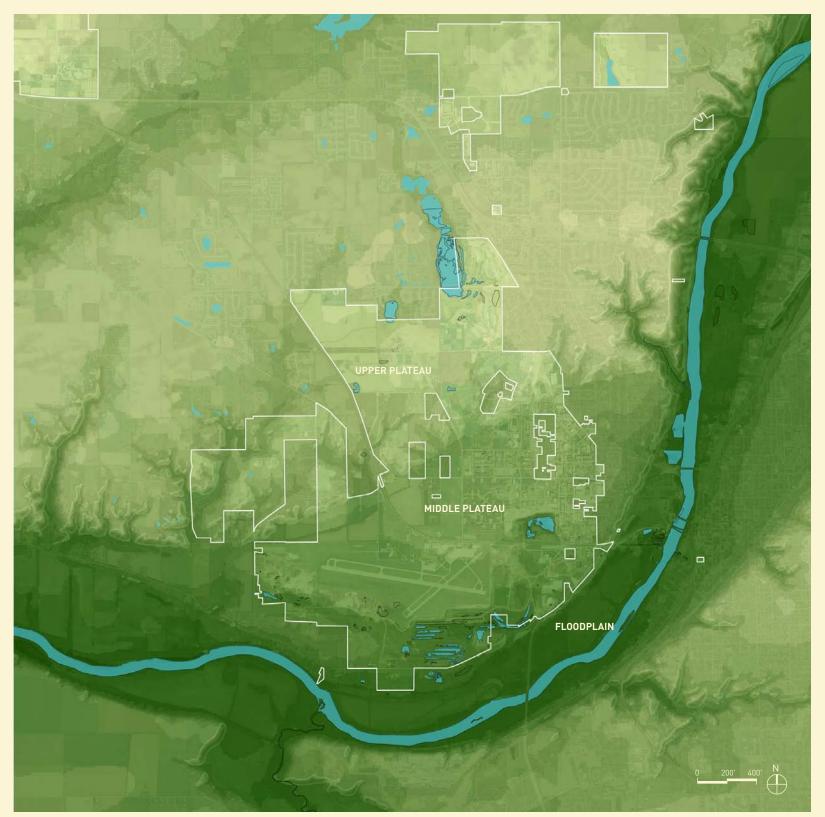
#### **History and Mission**

Purdue University is a public land-grant institution in West Lafayette, Indiana. The University was founded in 1869 under the 1862 Morrill Act when the Indiana General Assembly accepted a donation from John Purdue for a College of Science, Technology, and Agriculture. The Morrill Act empowered states to deed land to colleges and universities to teach agriculture, military tactics and the mechanical arts without excluding other scientific and classical studies "in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." The University has remained true to this mission, achieving a national reputation in agriculture, engineering, and many other programs.

The University opened for classes on the western side of the Wabash River in 1874 with 39 students and a handful of buildings. The initial emphasis was on engineering and agriculture. Eleven of the University's thirty historic buildings and sites were constructed before 1920. University Hall, built in 1876, is the oldest building on campus today. The Ross-Ade foundation, a critical force in campus development, was established in 1923 by David E. Ross and George Ade to manage gifts and hold property for the University's future growth. Donations to Ross-Ade enabled the University to build a stadium north of the core, and funded the creation of the Purdue Research Foundation (PRF). In 1924, Walter Scholer developed a master plan which established strong axes in the Beaux-Arts style which emphasizes symmetry, a hierarchy of spaces, and precision. These open space connections formed the guiding framework for the development of the campus core. In accordance with this framework, the University's nineteen remaining historic buildings were

built prior to the Second World War. After the War, the University experienced sharp increases in enrollment, reaching 11,472 students in 1946. By the 1950s, a significant amount of on-campus housing was built to the west of the academic core, and academic programs expanded significantly.

In recent years, the University has focused on collaborative research, both in Discovery Park, the campus' new research zone, and in satellite centers. Today, with a student population over 39,000 and more than 10,000 employees, Purdue University is the size of a moderate city, and enjoys a reputation as one of the nation's pre-eminent public institutions.



EXISTING TOPOGRAPHIC RELATIONSHIP OF UNIVERSITY TO RIVER

### **Regional Context**

#### The University System

The Purdue West Lafayette campus is the heart of a large university system with three regional universities: Purdue University Calumet and Purdue University North Central in the northwest part of the state, and Indiana University—Purdue University Fort Wayne in the northeast. Each campus has a unique identity and mission and, together as a system, they play a vital role educating the citizens of Indiana, the United States, and the global community.

#### **Economic Development**

The University's new strategic plan outlines the Purdue University Strategic Entrepreneurship and Economic Development (PU-SEED) super project to help catalyze rapid growth in the Indiana economy. The project's key objectives include making economic development an integral part of the University's research and globalization strategy, supporting an entrepreneurial culture throughout the state, creating a highly educated workforce, forging alliances with businesses, educating venture capitalists regarding Indiana-based opportunities, increasing investment state-wide, and improving the recruitment of companies to Indiana.

#### Ecology

The University plays a critical role as part of the broader ecological system within the Wabash River Valley. The campus sits up on a high plateau overlooking the River's floodplain. The land to the south and southwest of the campus is in a state of regeneration after previous mining disturbances. These disturbed lands provide storm water mitigation and contain a series of manmade ponds that provide wildlife habitat. The lands to the west and northwest are fragmented and contain recreational areas, agricultural and mowed fields, and fragmented forests. These lands also provide the environmental services of aquifer protection and carbon sequestration.

#### Transportation

Transportation planning at Purdue takes place within a context of regional transportation plans adopted by governmental agencies and endorsed by the University. Existing plans contain revisions to the alignment and configuration of U.S. and state routes and major arterials running through West Lafayette. U.S. Route 231, which extends to the northwestern part of the state, will move into a new corridor running south and west of the campus, resulting in the reduction of regional through-traffic on city streets. A planned perimeter parkway will loop around the campus, ensuring the realignment does not draw additional traffic along State Street.



EXISTING CAMPUS DISTRICTS

The Purdue campus is made up of several districts, subdistricts, and neighborhoods that are each defined by a particular array of land and building uses with attendant characteristics of density, scale, and landscape expression.

### **Campus Context**

The Purdue campus is made up of several districts, subdistricts, and neighborhoods that are each defined by a particular array of land and building uses with attendant characteristics of density, scale, and landscape expression. The variety of campus areas and the differentiation among them are typical of dynamic, complex learning institutions. They are, in fact, rich expressions of the diversity and vitality of the Purdue University environment. From a campus planning perspective, the imperative is to sustain the richness and diversity of place embodied in the multiplicity of campus districts, while drawing those districts together in a way that makes a holistic campus, and a coherent and memorable community.

#### **Campus Districts**

#### 1. North Academic Core

The north academic core is home to the main administrative buildings and many colleges and schools. Located north of State Street, east of University Street and west of Northwestern Avenue, the north academic core is a relatively pedestrian-friendly district comprising approximately 100 acres contained within a 10-minute walk circle. The 10-minute walk circle defines the distance students can reasonably cover on foot between classes. It is a useful measure of accessibility, compactness, and vibrancy. Historic quadrangles and open space axes organize the dense fabric of the buildings, and the Beaux-Arts axes meet at Purdue Mall. One of the central challenges for the master plan is to reproduce the district's character, simplicity, and atmosphere throughout.

#### 2. South Academic Core

On the south side of State Street, the south academic core has historically housed the agriculture, science, and veterinary schools. Growth here has been less structured and generally more sprawling. Various support uses, including facility services, printing services, etc., which historically have been located in this area, are being moved further south to a parcel south of the quarry pond. The quarry pond is the final destination for all stormwater on campus (although this will change as a result of a new stormwater management study currently under way) and represents an untapped resource for place making. The quarry could be a perfect location for active and passive recreation, as well as a major view feature. There are, however, significant physical modifications that must be made to the pond before this can occur.

#### 3. Discovery Park

Discovery Park lies immediately to the west of the south academic core. As the campus' newly developed onsite research center, Discovery Park has been the central focus of recent capital investment. With the proposed relocation of US 231, and the extension of Jischke Drive to it, significant potential exists for a major new southern entrance to the campus, highlighting the Park's research activity. This activity is currently somewhat physically disconnected from the main academic function of the campus. Prior to this update, plans called for the further westward expansion of Discovery Park into what is now Purdue Village.

#### 4. Purdue Village

Purdue Village is home to primarily international and married students. Purdue Village consists of two-story 1950s structures sited around parking lots and courtyards. While this organization encourages community interaction the built structures themselves are outdated, low-rise, and somewhat sprawling. Although the area has height restrictions because of proximity to the airport, there is significant room for additional program. A new child-care facility and a community center were recently completed.

#### 5. West Residential

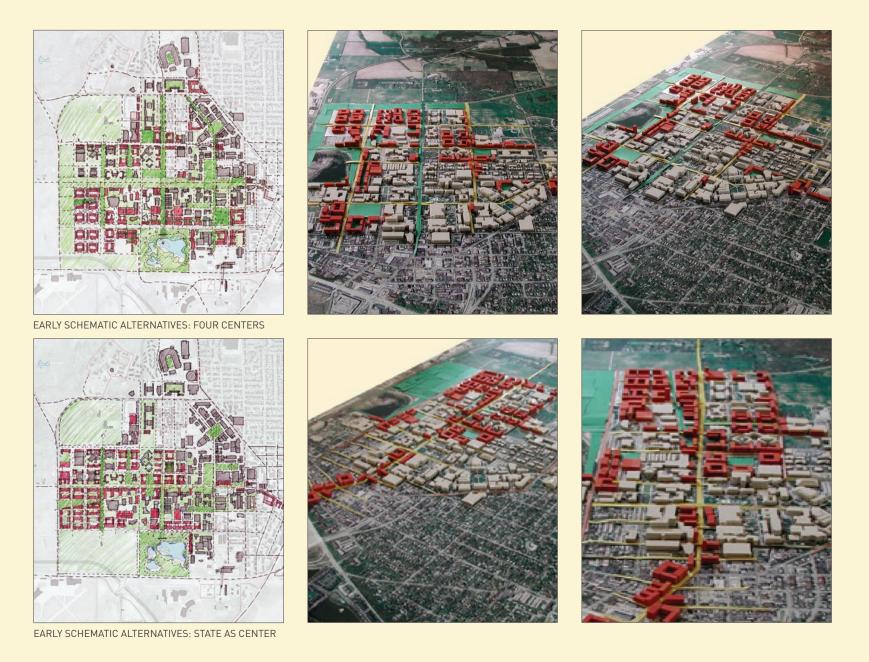
Approximately 11,500 students are currently housed by University Residences. Most housing is located west of the campus core, away from the University's main academic functions. The majority of undergraduate housing is located north of State Street, with Purdue Village to the south. The northern housing district is adjacent to athletic and recreational facilities, and playing fields in the northwest. The University plans to relocate several intercollegiate athletics facilities to the intersection of McCormick Road and Cherry Lane, north and west of campus. The University plans to extensively expand and renovate the existing recreation sports center which will further reinforce student life functions in this area.

#### 6. Island

The Island, located between University and Russell Streets, west of the north core and east of housing, is a unique zone that hosts a variety of organizational and cooperative housing, private housing, as well as religious organizations. At least two-thirds of the property in the Island is privately owned. Its inhabitants appreciate its unique neighborhood and residential scale. The University recognizes that any potential intrusion into the Island must be handled sensitively with minimal displacement of existing occupants, and is committed to engaging in a consultative process using a timetable driven by the condition of existing facilities. Suitable replacement sites will be identified, and these sites will have a similar intimate scale and good proximity to the campus. Prior to the master plan update, the University recommended limiting incursions south of Fifth Street. Sasaki's analysis suggests the area for possible intrusions

can be further reduced, and that targeted interventions can most likely be contained between Third and State Streets.

Third Street is an important east-west connection between the existing housing district and the north academic core. It represents a natural pedestrian desire line, and is a much frequented passageway. Analysis suggests that this spine could be further reinforced, and that Third Street would be a natural location for mixed-use development, such as additional housing with ground floor retail. Some retail uses could potentially migrate from Purdue West, a retail development on McCormick Road.



**purdue university west lafayette master plan report** analysis

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MEETING WITH THE COMMITTEE AND STAKEHOLDERS

**PROCESS** 

Purdue University developed around a historic Beaux-Arts plan created by Walter Scholer in 1924. This plan defined Memorial Mall, Purdue Mall, Agricultural Mall, and a connective spine which links these powerful open spaces. In 1986, Sasaki Associates prepared an update to the University's master plan which guided campus growth over roughly two decades. Purdue University campus planners in the Office of the University Architect worked on a further update in early 2000 which focused on identifying sites for future development, and locating planned capital projects through 2009.

Sasaki Associates was retained by the University in the fall of 2006 to build on this previous work and develop a new master plan update for Purdue's West Lafayette campus. Sasaki completed master plans for the three regional campuses concurrently to provide unity and clarity for the system.

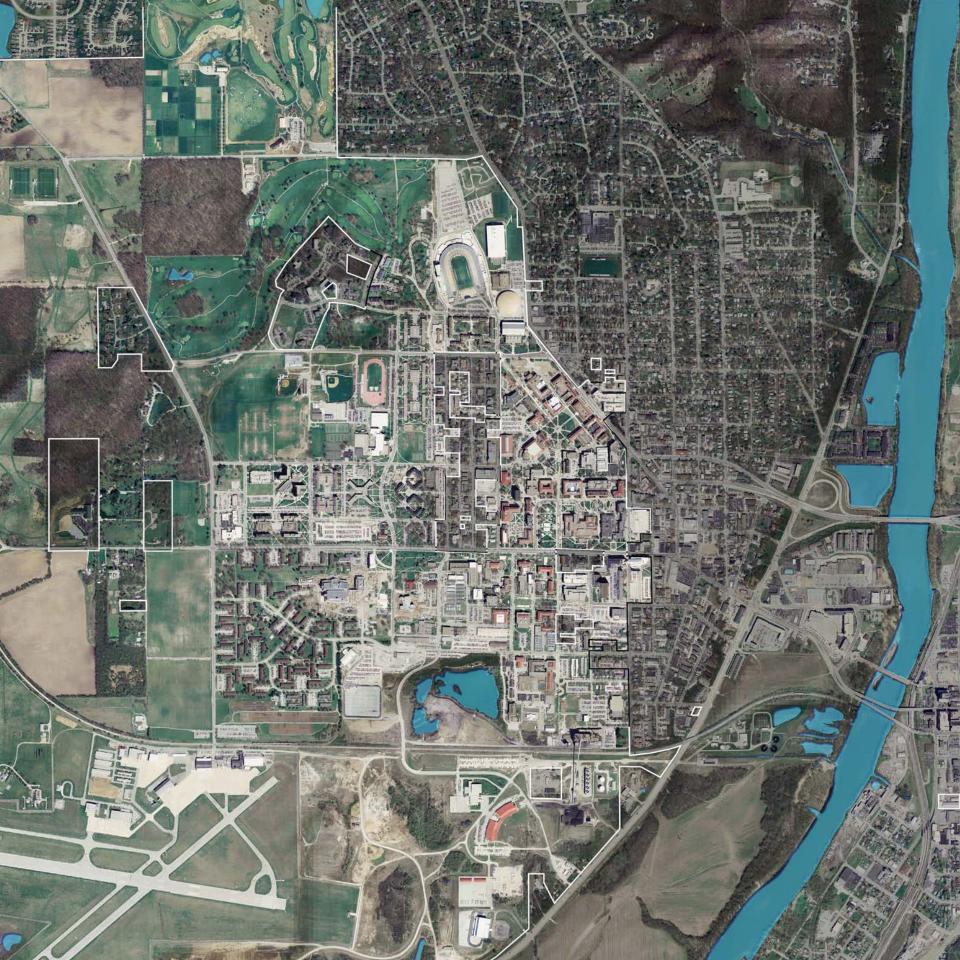
The master plan is the result of a highly collaborative process. The University formed a broadly representative Master Planning Committee, and the bones of the plan resulted from energized work sessions between the committee and Sasaki. In addition, Sasaki's frequent campus visits included discussions with stakeholder groups from both the University and the larger community, and public meetings. Constituents provided continual feedback which greatly influenced the developing plan.

The process began with a series of stakeholder interviews and site visits. The Sasaki team analyzed the resulting information and presented graphic and narrative findings back to the University. The analysis was structured using a series of "guiding questions" which Sasaki developed. The University's Master Planning Committee and other stakeholders provided feedback based on these questions. Sasaki incorporated these comments into two "big picture" alternative concepts for campus development: the first created four distinct centers, the second transformed State Street into a unifying center.

The two alternatives were explored during on-site work sessions using physical and virtual models. The most attractive elements of each scheme were identified, and a new hybrid scheme was developed. Over the course of several visits the hybrid scheme was refined until it reflected a broad consensus.

Concurrently, University President France A. Córdova launched a widely-embraced "bottom-up" strategic planning effort. Through various "Tiger Teams," the University formulated a series of white papers which detailed goals and priorities for the campus. The papers focused on: the student experience, large scale research and infrastructure, economic development, quality of life in the workplace, globalization, campus design, synergies between the sciences, engineering, the liberal arts and social sciences, and attracting new students to STEM careers. The white papers were synthesized into the University's new strategic plan, **New Synergies**. While the strategic planning effort and the master planning process were conducted separately, the two plans reached similar conclusions, and strongly reinforce one another.

The result is a master plan which excites the entire Purdue family, builds on the University's many existing strengths, and provides a clear roadmap for the campus' physical development over the next several decades.



## ANALYSIS

The master plan is grounded in a rigorous examination of existing conditions and available data sets. To structure the investigation, Sasaki posed five critical questions:

How should the campus grow?

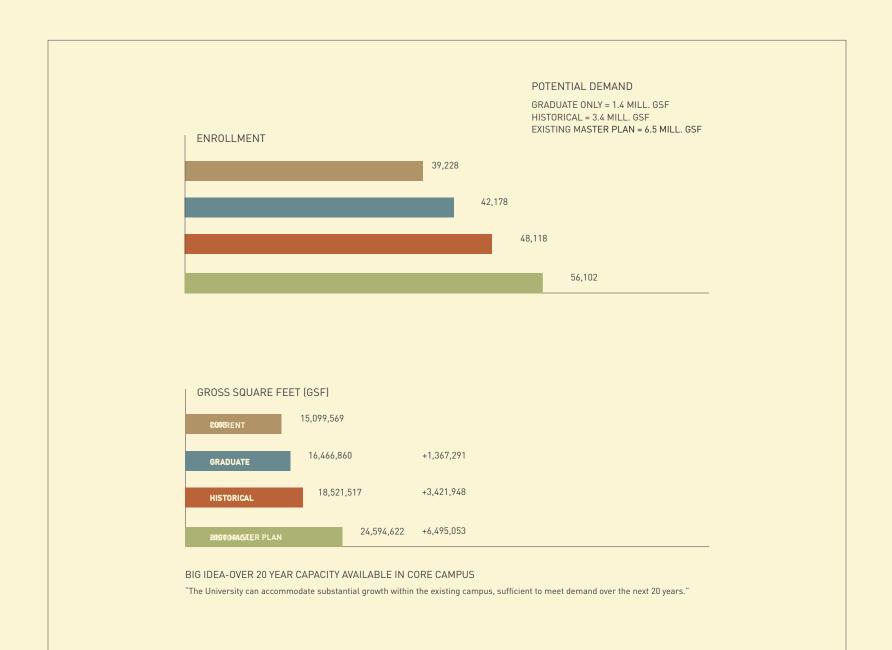
How should the campus engage the environment?

How should transportation serve the campus? How should the campus foster residential life? How should the campus engage the community?

The formulation and discussion of these questions focused attention on the critical decisions the University faces. The key outcomes are:

- The University has sufficient space within the existing campus bounds to accommodate future growth needs for the next twenty years and beyond.
- Research in the west and academic functions in the east must be re-integrated within a balanced residential context.
- The ecological benefits from preserving the University's western land holdings are significant, and argue strongly against continued westward sprawl
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- The University should collaborate with the cities of West Lafayette and Lafayette, as well as with the County, to the benefit of all parties, discouraging car-driven suburban style sprawl, encouraging stable owner-occupied neighborhoods close to the University, and strategically directing rental housing and mixed-use development.



### How Should the Campus Grow?

#### Capacity Needs

Sasaki undertook a rigorous analysis of likely space needs and the capacity available within the existing campus bounds. The analysis demonstrates the University can accommodate substantial growth within the existing campus, sufficient to meet demand over the next 20 years.

Sasaki considered three different enrollment scenarios for future growth: an historical extrapolation of existing growth trends in student population over the last approximately ten years; the population supported by the University 2000 Master Plan Update; and, the most likely scenario, growth in graduate programs only.

Purdue's historical enrollment levels are non-deterministic, with fluctuations based on historical circumstances, shifts in demographics, and the increasing role of international students. Nonetheless, enrollments—particularly undergraduate enrollments—have increased steadily since the end of World War II. Linear extrapolations suggest the need for just over 3.4 million additional GSF by 2026 if these growth patterns continue.

The proposed 2000 Master Plan identifies scheduled projects due for completion by 2009, as well as long-term potential sites for development. By applying the current ratio of building footprint to building gross on the existing campus and assuming single-story development for all construction outside the existing campus, Sasaki estimated a total projected growth of 6.5 million gross square feet. This is an aggressive projection that is unlikely to be realized. It provides a clear maximum on the amount of additional space that might be required.

The final scenario modeled the University's growth pattern, assuming increases primarily in the graduate population. The suggested 20-year need in this case was just under 1.4 million additional GSF. In order to compare the space demand generated by the scenarios with existing site capacity, Sasaki estimated the amount of building gross square footage which might be accommodated within the existing campus bounds. The primary analytical tool for measuring density is the Floor Area Ratio (FAR): the ratio of building gross square footage (GSF) to land area. An FAR of 1, for example, results from a single story building covering an entire site or by a four-story building covering 25 percent of the site. The great American campuses typically have FARs between 0.8 and 1.5.

The historic north academic core is the densest area on campus with an FAR of 1.4. The quality and feel of this space is highly valued by the campus community. If the south academic core, which currently has an FAR of 0.65, were to reach the same density as the north, it could accommodate approximately 5.4 million additional GSF.

Outside the core academic spaces a lower density may be more appropriate, reflecting the change in character and use. The residential areas, with a current FAR of 0.6, could accommodate an additional 2 million GSF of building at an FAR of 1. Purdue Village, currently at 0.16 FAR, could accommodate an additional 3 million GSF at an FAR of 0.8.

Totaling these results suggests the existing campus could accommodate more than 10 million additional GSF. Although this is a theoretical number which simplifies issues of site opportunity, existing constraints, and detailed parking strategies, it is significantly higher than even the most aggressive demand projection—the 2000 Master Plan projection required 6.5 million GSF (and the capacity limit assumed very limited growth in the Island).

#### Space Needs

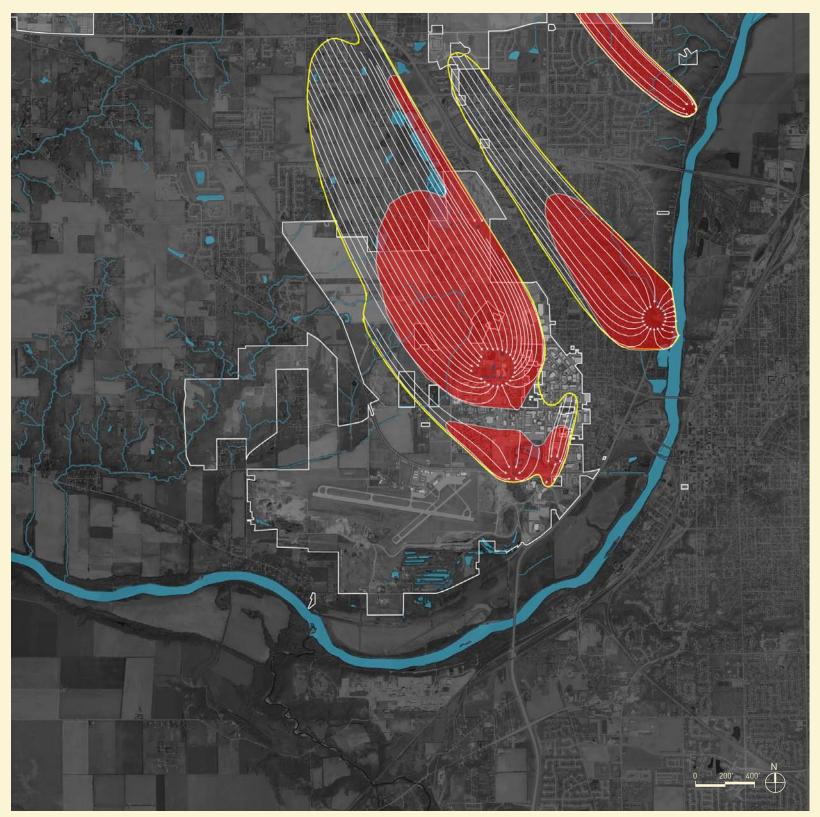
Sasaki also undertook a high-level analysis of the kinds of space the University might require. This analysis confirmed internal work by the University's Space Management and Academic Scheduling (SMAS) group. SMAS undertook a peer comparison study which identified the University's primary space needs as being in classroom, library and study, and student life spaces.

Research space needs are mission-driven. The campus has recently invested heavily in research space, and per capita improvements relative to peers are marked. Additional space may still be required, particularly if graduate numbers increase, and funding brought in by Discovery Park and other research initiatives increases. The strategic white paper on large scale research has identified these needs as a priority.

As new buildings are constructed, it is critical that accessibility concerns are addressed at all levels. This will include, amongst other things, the provision of specially designated parking spaces, ramp access and elevators, and suitable rest room facilities. Wherever possible, new facilities should employ sustainable design, minimizing energy usage and ecological impact. Facilities should be as flexible as possible to maximize possibilities for adaptation over the long term.

## The Evolving Campus Center and the Role of State Street

The historic academic core of the Purdue campus is located north of State Street. However, due to space and land constraints, over the last several years the campus has gradually expanded to the west and south. Instructional, research, residential, dining, and collaborative space is now distributed throughout the entire campus, resulting in a series of vibrant, mixed use districts. Sasaki's analysis suggests that the role of State Street is critical in terms of serving as a central, unifying feature for these districts, thereby creating a cohesive spine around which future development occurs.



EXISTING WELLHEAD PROTECTION ZONES - TIME OF TRAVEL

# How Should the Campus Engage the Environment?

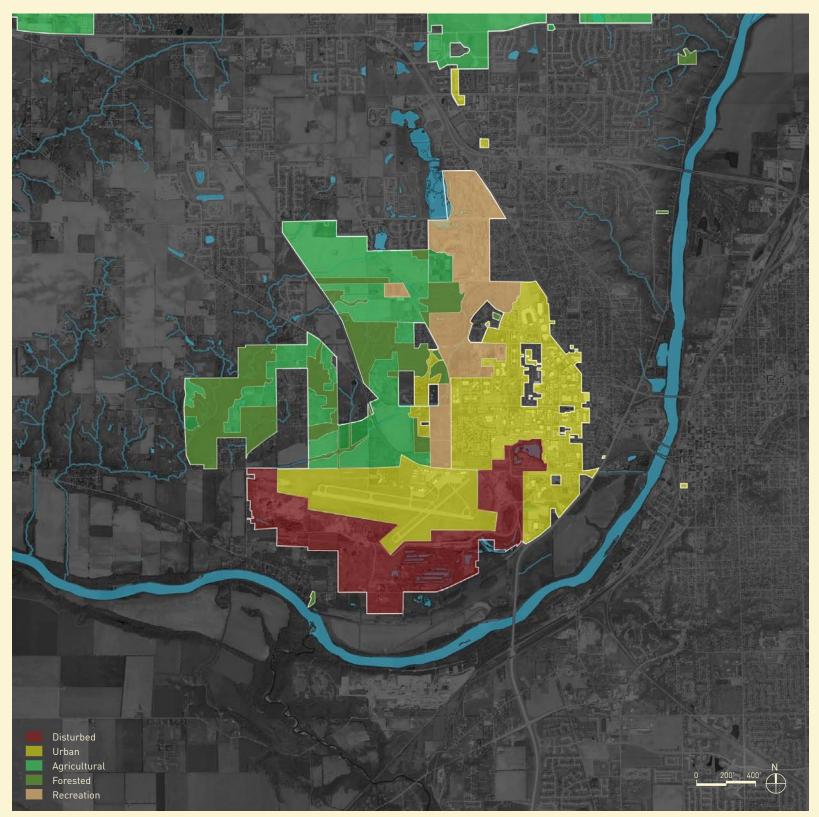
#### Broader Landscape Context

The campus is set within the gentle topography of the Wabash River Valley. Glacial movements and the Maumee Torrent carved the current river valley and created a series of ascending plateaus that have created favorable conditions for campus development and concentrated growth. The plateau zone between 600 and 680 feet has historically held the bulk of campus development. Developing on the campus plateau has reduced the environmental and financial challenges associated with building on steeper topography. In addition, the plateau's southern by southeastern exposure has created opportunities to maximize building efficiencies through solar orientation. Focusing future development within the plateau will maximize the advantages of these natural features.

#### Wabash River Valley Aquifer

The University's water supply comes from the Wabash River Valley Aquifer. The superposition of the Wabash River and the Wabash River Valley Aquifer creates ideal conditions for large-scale ground-water extraction. This abundance of groundwater resources has contributed significantly to the economic development of the area and the prosperity of the University. Campus well-heads and their respective travel times of returns are shown in the figure on page 28. The 5- and 10-year travel times of return are critical zones of protection for any public water supply. Within these western protection zones, land uses that reduce the risk of aquifer contamination should be favored.

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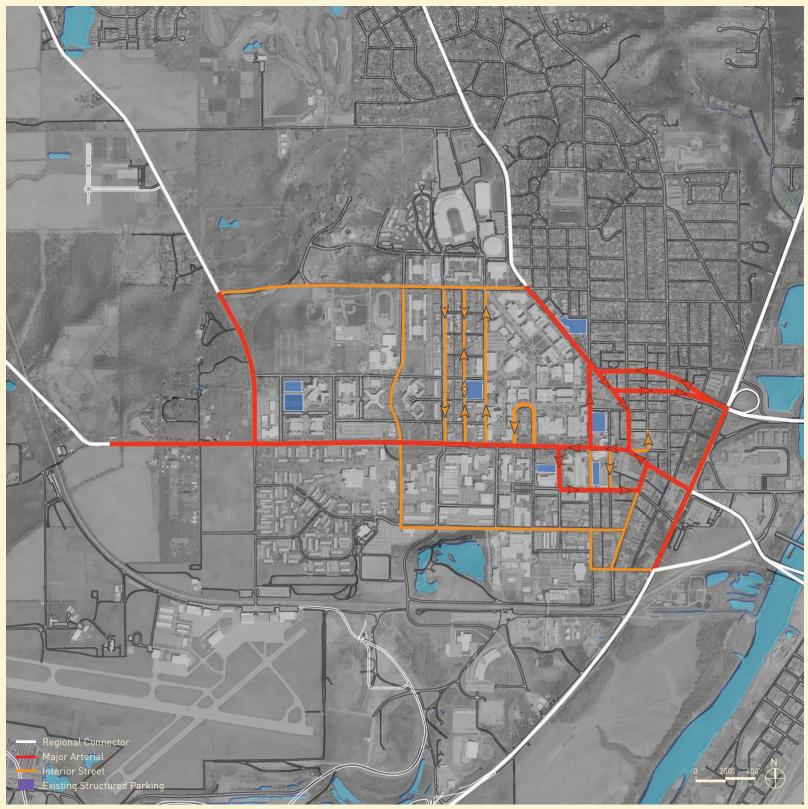
EXISTING LAND COVER

#### Land Use

Currently, a variety of land uses exist within the western campus lands. These uses include a quarry operation, row-crop agriculture, forest cover, recreation fields, mowed fields, and two golf courses. Several of these pose the risk of chemical spills, such as herbicides and pesticides, which could contaminate groundwater resources.

In addition to the risk of groundwater contamination, the fragmentation of the western Purdue lands has degraded stream corridors and wildlife habitat. The streams receive large volumes of sediment and pollutants from surface runoff as they pass through ditches and agricultural fields. The open exposure of the fields and ditches also leads to increased water temperatures within the stream. The result is a warm stream that is laden with sediment, supporting little biological life. These streams also contribute negatively to the entire watershed upon discharging into the Wabash River.

Indiana's forests once covered approximately 85% of the state. Current estimates of forest cover in Indiana are approximately 20%. Historically, this large reduction in forest cover occurred in large part due to agricultural clearing. As a result, many forests exist as isolated patches within the state. The western lands are no exception. McCormick Woods and Horticulture Park represent two large forest patches that stand isolated within the western lands. Fragmented forests offer limited interior habitat and subsequently support a smaller population of native flora and fauna. Establishing a contiguous forested band within the western lands would increase the habitat value within the western lands.



EXISTING TRAFFIC PATTERNS

# How Should Transportation Serve the Campus?

#### The Existing Network

#### **One Way Streets**

The existing transportation plan relies on a comprehensive system of one-way streets to prevent their use as cross-campus arteries and to keep traffic on the perimeter parkway.

One-way streets create wayfinding issues. The existing one-way streets in the Village and the Island hinder navigation, especially for visitors to Purdue. They foster aroundthe-block driving, resulting in extra vehiclemiles traveled, with attendant increases in traffic volumes, and increased vehicle emissions. Over long distances, one-way streets encourage speeding and can be detrimental to pedestrian safety and comfort. One-way streets also have a perceptual and psychological effect on urban environments. Drivers are forced to focus on signs regulating their direction and turning movements. When streets are two-way, drivers are able to pay more attention to the surrounding built environment and to pedestrians.

The judicious use of one-way streets can, however, contribute to an improved pedestrian environment. In short sections, one-way streets can calm traffic by averting throughmovements. In narrow street segments, they allow on-street parking by reducing the number of needed travel lanes, providing a buffer between traffic and sidewalk while increasing the supply of convenient parking and animating the street.

The plan for street circulation therefore needs to carefully weigh the pros and cons of one-way street segments on a streetby-street and block-by-block basis. The effects of one-way streets on the pedestrian environment, on bicycles, and on vehicular traffic flow must all be considered. The presumption should always be that two-way streets are more legible, natural, navigable, and safer.

#### The Role of State Street

Bisecting the campus, State Street currently forms a physical and symbolic barrier between the northern and southern zones of campus activity. Due to its current designation as a state highway, the University has little control over this key artery. High traffic volumes and the University's inability to impose traffic calming measures have perpetuated State Street's identity as a campus divider. The master plan must instead embrace State Street as a unifying element with the potential to provide both greater connectivity and a front-door presence for all facets of University life.

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EXISTING TRANSPORTATION PLAN FOR THE PURDUE UNIVERSITY AREA

The proposed perimeter parkway will reduce traffic volumes on State Street. State will become a local street that serves, and is more integral to, the Purdue campus.

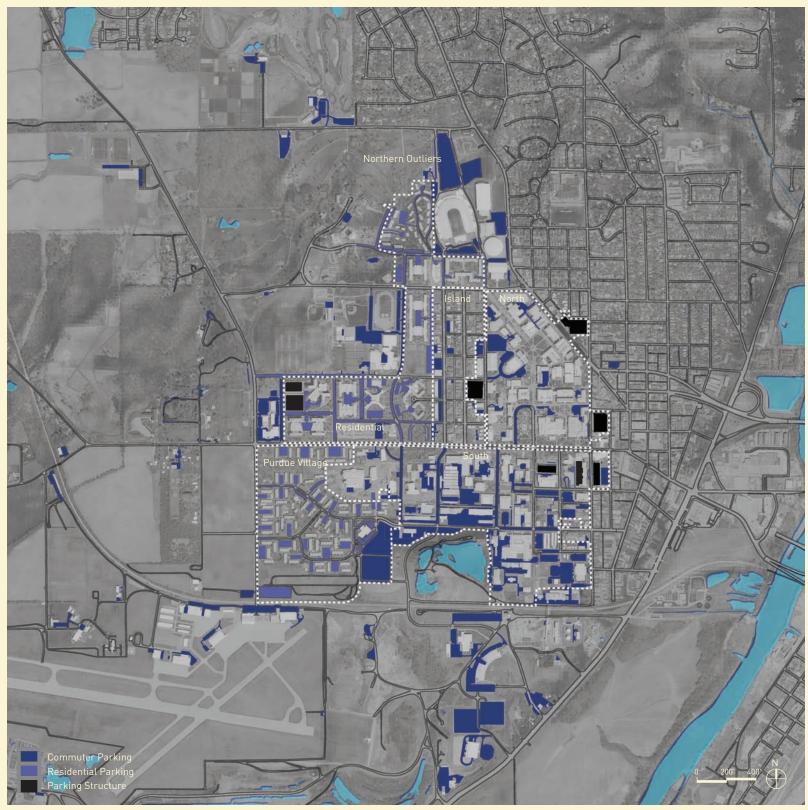
#### The Proposed Perimeter Parkway

The existing Transportation Plan for the Purdue University Area adopted by the Tippecanoe County Area Plan Commission includes the realignment of US 231 from its current designation along Northwestern Avenue into a new corridor running south and west of campus. Concurrently, the designation of State Street as SR 26 will be removed, thereby relinquishing State Street to local control and providing more flexibility for future plans to downgrade the street. This will create improved traffic flow and pedestrian conditions, both along State Street and between the north and south sides of campus.

A perimeter parkway will be created around the campus, forming new gateways to the west and south. The existing parkway proposal uses new and existing road segments to form a continuous ring around the campus carrying both regional traffic and vehicles with Purdue destinations.

SR 26 will be redesignated from the portion of State Street running through the campus to the relocated US 231 highway. The proposed perimeter parkway will reduce traffic volumes on State Street. State will become a local street that serves, and is more integral to, the Purdue campus.

The regional Transportation Plan also envisions an extension of North Jischke Drive to the north of Tower Drive, running around the west and north sides of the stadium and connecting to Northwestern Avenue at the location of its existing intersection with Cherry Lane, which will be realigned slightly to meet the North Jischke Drive extension. The purpose of the North Jischke Drive extension is to provide more direct access to the perimeter parkway from the north; to provide an alternative route from Northwestern Avenue to Stadium Avenue that does not involve the acute-angled intersection between those two streets; and to reduce traffic on the segment of Stadium Avenue between North Jischke Drive and Northwestern Avenue, which runs through a dense area of the campus with high pedestrian activity. This proposal involves a potential disruption of Hilltop Apartments and the creation of a new roadway through difficult topography and what is now a beautiful area of campus. Moreover, the possibility of adding new residences, thereby increasing density, will make this an even more congested area.



EXISTING PARKING

#### **Commuter Parking**

Currently, there are approximately 12,000 parking spaces available on Purdue's campus. By campus zone the number of spaces are as follows:

SPACE
4,604
4,501
67
113
1,060
1,671
12,016

Campus-wide, the peak occupancy of existing commuter spaces is 75%. The standard industry benchmark for parking occupancy assumes the "functional capacity" of parking facilities is 90% of actual capacity which ensures spaces will be readily visible and conveniently available. Using this standard, the existing surplus of parking spaces is 15% of the total supply, or approximately 1,700 spaces. The data suggests all areas of campus (with the small exception of the Island) are adequately served, and parking in the Discovery Park lot, is significantly underutilized.

Comparison of existing enrollment with existing parking need provides a factor which can be used to project future parking need as a function of future enrollment. Using the historical extrapolation and graduate growth only scenarios as detailed in Capacity and Space Need, estimated future parking needs for the campus would be

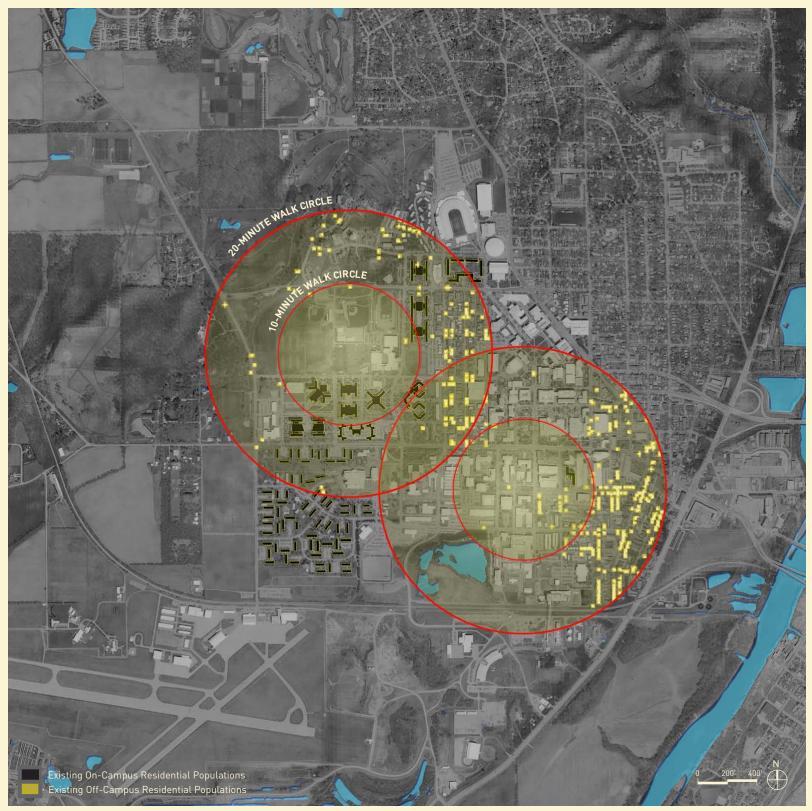
ZONE	EXISTING SUPPLY	EXISTING OCCUPANCY	SURPLUS/ DEFICIT
North	4,604	78%	563
South	4,501	78%	521
Island	67	99%	-6
Residential	113	65%	28
Purdue Village	1,060	40%	527
Northern Outliers	1,671	84%	101
TOTAL	12,016	75%	1,734

SCENARIO	ENROLLMENT	PARKING NEED						
2005-6	39,228	10,282						
Grad. Only	42,178	11,203						
HISTORIC								
10 Years	43,953	11,674						
20 Years	48,118	12,780						

This suggests that, even under the higher historically-based growth projection, future demand will not exceed existing supply for approximately 13 years, assuming the existing supply remains intact. This is unlikely to be the case, since some existing surface parking will be needed to accommodate open space and building program initiatives. Parking for residential students must also be factored in. Location and suitability of existing parking is also an issue; the usage statistics show some lots—the Discovery Park lot southwest of the Harrison Street/Jischke Drive intersection for example—are not well used, most likely because of distance from the campus core and condition. A comprehensive parking solution should relocate spaces to more convenient sites, including sites well-served by CityBus, replace displaced spaces, and employ transportation and parking demand management strategies, like restricting parking access privileges, creating differential pricing for premium spaces, improving transit services, and promoting alternative means of transportation.

A detailed Transportation Demand Management (TDM) study is currently underway. This study will provide results based on updated parking data in a separate report.

BASED ON FALL 2006 UNIVERSITY PARKING OCCUPANCY SURVEY



EXISTING LOCATION OF RESIDENTIAL STUDENT POPULATIONS

### How Should The Campus Foster Residential Life?

#### **On-Campus Populations**

University Residences housed 11,564 students at the start of the fall 2008 semester: 10,589 undergraduates and 975 graduate students Included among these numbers were 821 students (predominately graduate students) with families living in Purdue Village. This total of 11,564 represents approximately 30% of total enrollment. The University houses all freshmen who request accommodation, although this has required some careful juggling of available resources.

The existing housing stock is concentrated on the western edge of campus (Hawkins Hall in the Southeast being the only exception). Undergraduates are housed primarily in residence halls with a meal plan, and graduate students primarily in apartments in the southwest with some in Hawkins Hall in the southeast. There is also an undergraduate population in Hilltop Apartments in the northwest.

The housing stock typology is dominated by doubles along corridors with shared "gang" bathrooms. These doubles account for 62% of all beds. Doubles with bathrooms make up 10% of the existing inventory, singles 9%, triples 1%, and apartments 18%. The predominance of traditional doubles means that approximately 43% of all sophomores living on campus are served by gang bathrooms and this point of dissatisfaction has contributed to students moving off-campus once they complete their freshmen year.

Two new housing buildings are currently under construction, Replacement Student Housing I and II. These facilities will provide 365 additional beds, each with their own bathroom, between State and First Streets, east of MacArthur Drive. A third building is planned for the future.

The new dining court south of Wiley Hall opened for the Fall 2008 semester; additional dining facilities are located at Earhart, Ford, Hillenbrand and Windsor The ten minute walk circles around these facilities cover the residential zone (including the Hilltop Apartments), but exclude almost all of Purdue Village, and are concentrated on the western edge of campus. With the exception of Hillenbrand Hall these dining courts are all new in the past 6 years and were sized to meet the anticipated demand from the existing housing facilities. Current dining patterns suggest that there is capacity to serve a small number of additional beds.

University Residences is committed to investing and maintaining existing facilities. Pre-existing plans include commitments to de-densify Hilltop Apartments and Meredith Hall, the facility currently in the worst condition. Significant renovations (mostly gut) were recently completed in Cary Quad, and the first of five planned renovation phases was completed for Windsor.

The proposed perimeter parkway will potentially impact the existing housing stock, resulting in the loss of several buildings. In Purdue Village, buildings 147 through 151 located south of Arnold Drive may be demolished. There is also a potential impact on Hilltop Apartments, although Sasaki strongly recommends that the perimeter parkway avoid them.

#### **Off-Campus Populations**

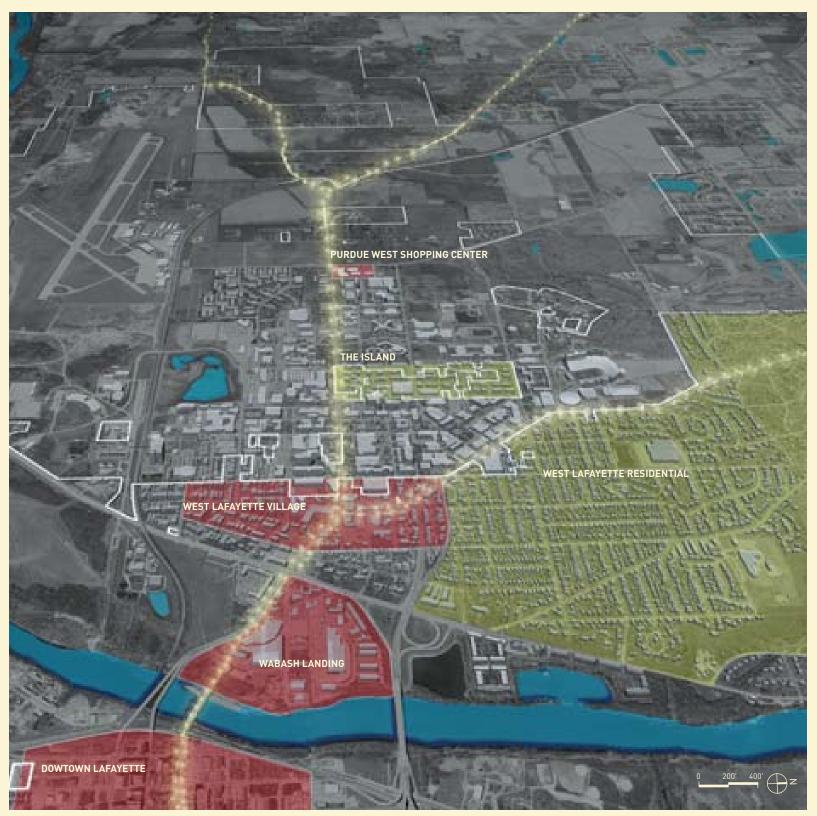
Approximately 70% of Purdue students are not housed by University Residences: 8% live in organizational housing or cooperatives and 62% live off-campus. The City of West Lafayette has 29,000 residents with 10,500 housing units of which 65% are renter occupied according to the 2000 Census data. The Village (and its surrounds), the Island, and new developments to the northwest have the highest percentage and density of renter-occupied units within the city, reaching as much as 80% renter-occupied. This has significantly impacted existing family neighborhoods which used to be owner-occupied, particularly neighborhoods east of campus.

The majority of organizational and cooperative housing is located in Tower Acres and the Island. As of 2006, there are 3,119 students housed in organizational housing and cooperatives: 41 fraternities with 1,644 residents, 20 sororities with 1,133 residents and 12 cooperatives with 342 residents. The southeastern portion of campus is particularly underserved with regards to University Residences. Approximately 6,316 students live within a ten-minute walk circle centered just to the west of Hawkins (with 2,245 students within five minutes). These students live in the neighborhoods and the surrounding Village, a highly desirable location. Yet this portion of campus has no recreation or food facilities other than the Memorial Union north of State Street. Furthermore, 10,000 faculty and staff work within this ten minute walk circle, with very limited access to dining and recreation opportunities. There are, however, numerous private-sector food service outlets, predominately "fast food," and a small City Park just east of this walk circle in the Village area.

#### Mission

The University has traditionally regarded University Residences as a self-supporting operation. Given the cost to build new residence halls to "institutional-quality" construction standards (and the necessary reinvestment to existing facilities), University Residences may find it can only make limited strategic moves over the next ten years. In this context, particularly given the emphasis on living-learning communities in New Synergies and the marked improvements in retention and academic performance resulting from on-campus housing, the larger University may want to consider whether housing's contribution to the institution's mission warrants capital support.

The University may want to reconsider the need to build new residence halls to "institutional-quality" standards. "Developer-quality" construction standards may be appropriate for some building sites. Additionally, University Residences should also explore partnership strategies with developers like PRF. Developer partnerships may benefit the University, but require careful thought to ensure that developer-built facilities are of suitable quality and are adequately maintained. University Residences will prefer to operate any developer-built facilities for undergraduate housing to ensure that the students living in these facilities receive the benefit of a professionally-managed residential life program and to maintain a seamless on-campus housing experience for all students living on campus.



EXISTING OFF-CAMPUS COMMUNITIES

# How Should The Campus Engage the Community?

Opportunities for development around the campus and along the State Street corridor are currently dictated by the established zoning requirements. Zoning west of the main campus is for agricultural and single family residential uses, while east of the campus the zoning is for residential and commercial uses. South of campus, below the railroad, zoning is industrial. North of campus, zoning is for a mix of low-density residential and commercial uses.

Wabash Landing, located between the campus and the river is the main commercial area of the City of West Lafayette, with commercial, retail and residential uses. Opportunities for sustainable enhancement and development of the river and its corridor, including potential partnership opportunities with the University, are being identified by the Wabash River Enhancement Corporation as it develops a master plan for the river corridor. The City of Lafayette's Historic Downtown, east of the river, mixes restaurants, retail and housing uses in a well preserved urban fabric. A pedestrian bridge runs parallel to SR 26 and connects downtown Lafayette to West Lafayette through Wabash Landing and the Levee area. Wabash Landing and the Village are currently linked to the campus by the Wabash Trolley. In the future, this corridor should be strengthened by establishing a common streetscape plan and developing an economic strategy which preserves the uniqueness and interdependence of each district.

The Village is the area of West Lafayette immediately adjacent to the western edge of campus. It includes a retail core and residential units, and comprises approximately 88 acres. It is roughly bounded by Grant Street to the west, Williams Street to the south, Salisbury Street to the east, and Fowler Avenue to the north. The City would like to preserve the Village's character with retail on the ground floor, no setbacks, and parking located behind buildings. Downgrading State Street will benefit the Village by encouraging students to live and shop along an enhanced pedestrian connection, particularly if the Village can be included within the perimeter parkway.

Zoning in the Village is a mix of R3W residential which allows multifamily dwellings, CBW central business zoning primarly along State Street, and planned development units. Currently, there are a limited amount of planned development zones that allow for mixed-use development.

The Island is mostly occupied by organizational housing and cooperatives with only three campus buildings. Its zoning is currently residential, allowing for multi-family dwellings.

The proposed perimeter parkway and re-alignment of US 231 will create a strong incentive for commercial developments at the new intersection of US 231 and State Street west of campus. The University should proactively plan for this important intersection to discourage typical suburban style development.



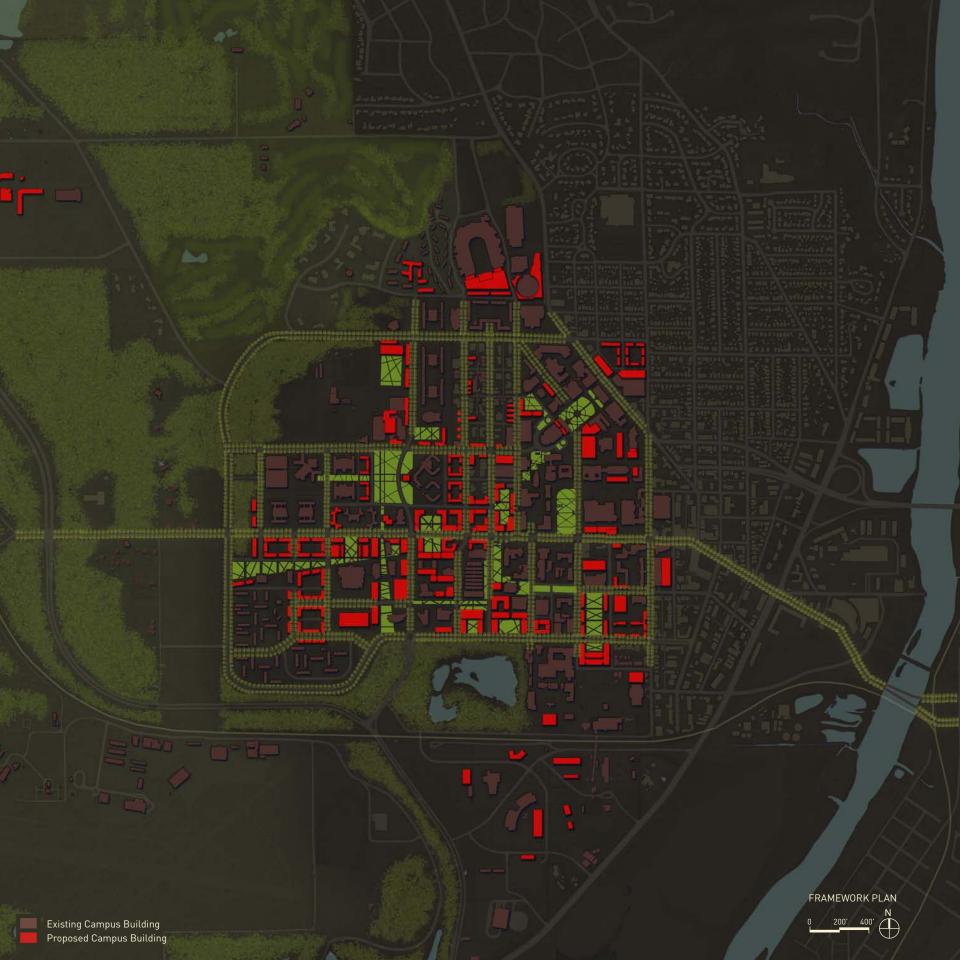
# CAMPUS MASTER PLAN





ILLUSTRATIVE OF LONG-TERM CAMPUS VISION





## FRAMEWORK

### **Core Principles**

The master plan for Purdue University relies on five core principles. While the plan details building site opportunities, service access, infrastructure, and other specifics, it is inevitable that the University will face unforeseeable choices over the life of the plan. The purpose of the core principles is to establish a flexible framework for decision making, one that will act as a reference guide when unexpected developments arise.

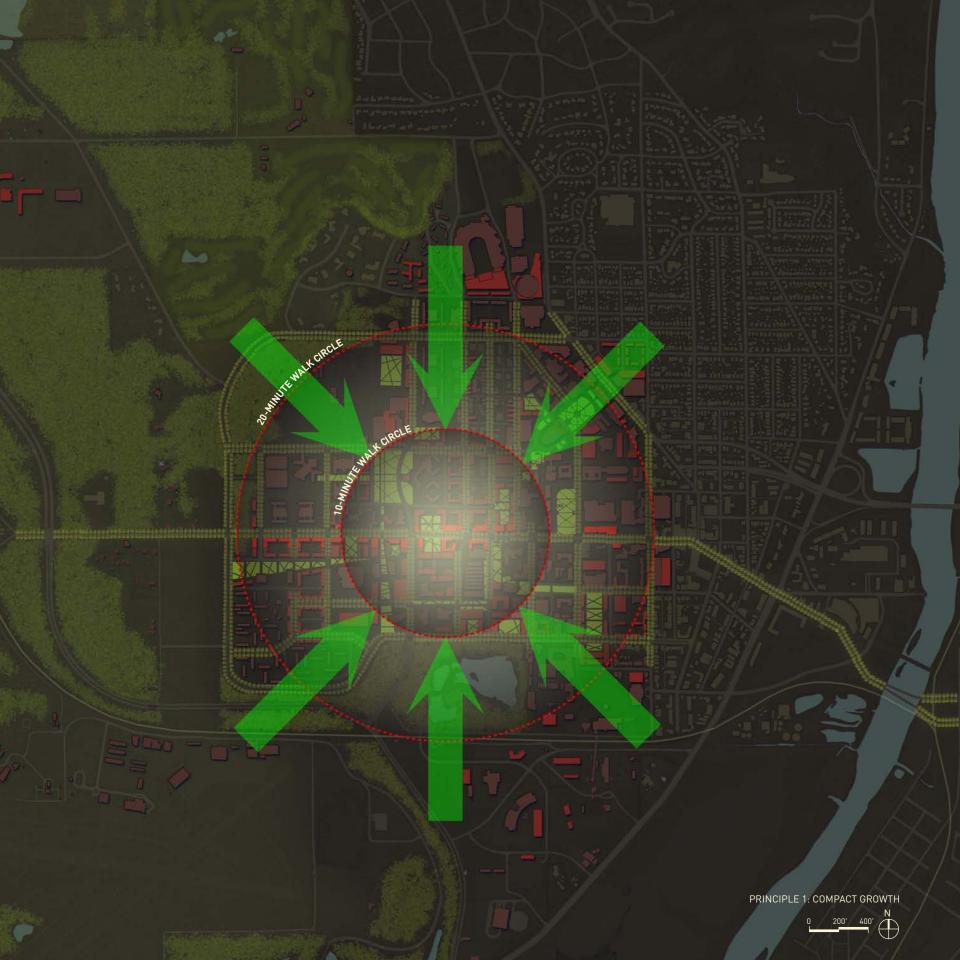
# Principle 1: Promote compact growth within the existing campus

Principle 2: Establish State Street as a collaborative center

Principle 3: Create program synergies through strong mixeduse districts

Principle 4: Encourage a simple integrated transportation system with a Perimeter Parkway

Principle 5: Preserve the Western Lands



# Principle 1: Promote compact growth within the existing campus

#### The University has sufficient space within the existing campus bounds to accommodate future growth needs for the next twenty years and beyond.

The challenge for Purdue, given its 2,307 acres and 40,000 students, is to maintain cohesion, a "human scale," and a campus that fosters collaboration and synergies. Historically, the existing campus growth trend has been westward and sprawling with the north academic core pushing into the Island, recreational and athletic fields moving west, Discovery Park expanding into Purdue Village, and student life moving outward. If unchecked, this trend would likely continue, resulting in diminished potential for a collaborative, synergistic learning environment.

The existing campus core—the area bounded by McCormick and Airport Roads on the west, Northwestern Ave and Grant Street on the east, Stadium Avenue on the north, and Harrison Street on the south—has sufficient capacity to meet all of the University's growth needs for the next twenty years (and potentially beyond).

Compact growth has several benefits: it creates community, promoting collaboration and synergy. It is more sustainable and efficient, dampening the need for automobiles and limiting infrastructure line lengths, and it supports great place-making where buildings (and the programs they contain) are not isolated, but instead frame significant open spaces.



#### Principle 2: Establish State Street as a collaborative center

#### State Street must become a unifying feature at the heart of student and academic life rather than a campus divider.

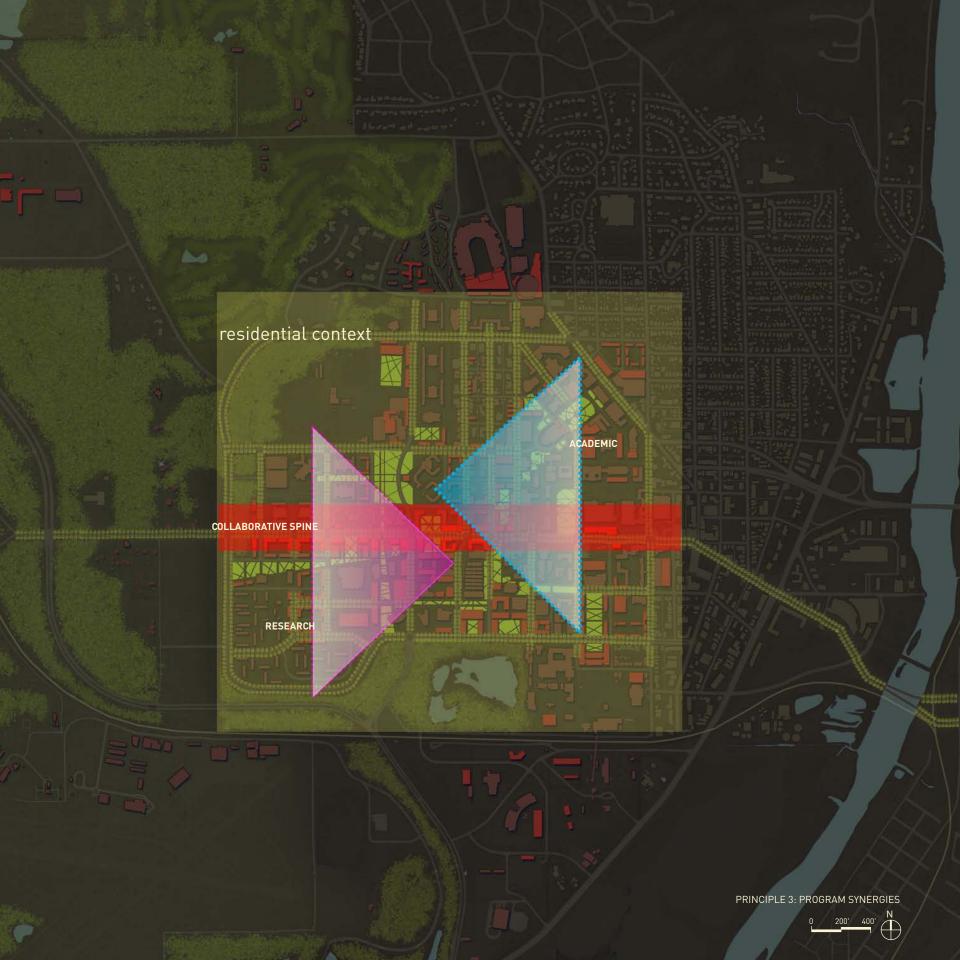
Given the existing disbursement of classrooms, labs, student life facilities, and other program elements, the crossing of State Street is already a reality.

The Beaux-Arts axis through the existing academic core provided an organizing structure which created the beautiful campus heart so highly treasured by the Purdue family. The campus now requires a new organizing axis for the twenty-first century. State Street must be this axis.

State Street occupies the geographic center of the campus. Academic programs have spread north and south of State Street. While the University is too large to ever have a single center of activity, it is vital the campus have a single "main street" off of which its multiple centers can connect. For this reason, the master plan promotes a "move to the center": focusing future campus growth on the State Street corridor in order to create a collaborative seam in the campus heart.

Given this strong central organizing touchstone, the four existing centers of campus activity—the academic core in the northeast, the residential and recreational zone in the northwest, Discovery Park and Purdue Village in the southwest, and the academic center in the southeast —must each be strengthened.

Growth in each zone will be governed through the creation of a significant open space. These large iconic open spaces will all connect back to State Street through a series of linked stepping quads, creating vital diagonal arteries linking the campus northeast to southwest, and southeast to northwest. The physical vision of the campus must directly embody Purdue's new strategic vision, **New Synergies**, and this is the direct intent of the proposed physical connections. Finally, the State Street corridor is an intentionally inclusive gesture that stretches beyond the campus bounds and strengthens associations between the campus and the cities of West Lafayette and Lafayette and the County.



# Principle 3: Create program synergies through strong mixed-use districts

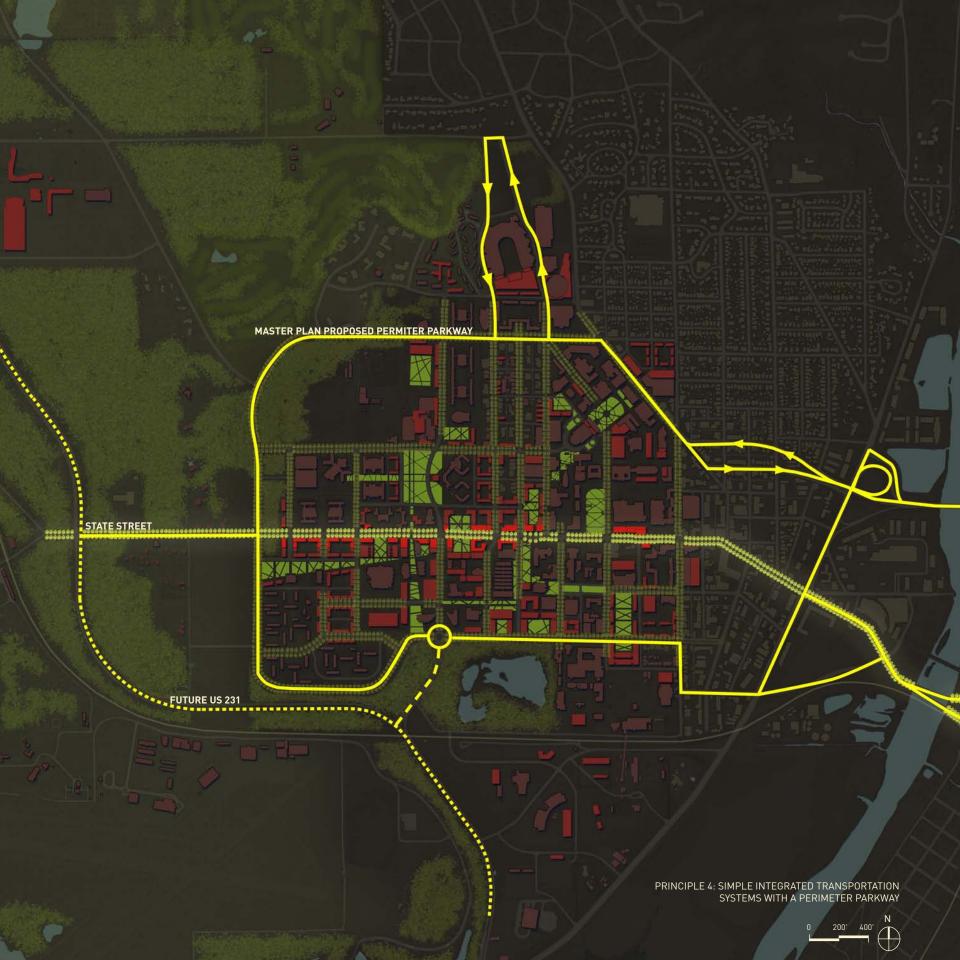
#### Research in the west and academic functions in the east must be re-integrated within a balanced residential context.

Programmatically, the plan seeks to link the traditional academic core to the new research district in Discovery Park. The collaborative zone of State Street is the primary manifestation of this idea. Academic functions move west and south, sensitively engaging key parcels in the Island along State Street, while research functions move east towards the existing academic core (and not west as in previous plans).

This programmatic movement—the central collaborative spine along State Street with research and academics reaching out toward one another—is surrounded and anchored by residential life. The master plan strongly promotes the creation of mixed-use districts. To this end, the diagonal axes through each of the four centers are anchored by significant residential districts.

Existing student residential populations are concentrated on the western edge of campus. Off-campus, students occupy and negatively impact former single-family neighborhoods. The strategic creation of new residential communities around the academic/research core, and the enhancement of existing residential communities will help the neighborhoods, and balance the overall campus experience.

By surrounding the day-time activity of the University with residential life, the master plan seeks to promote a campus that is active, vital and vibrant 24 hours a day.



#### Principle 4: Encourage a simple integrated transportation system with a Perimeter Parkway

#### The University's transportation needs are best met by a road network that promotes clarity and simplicity.

The transportation plan network must be simple and navigable wherever possible. With very few exceptions, streets should be two-way.

Transportation strategies must go beyond the automobile. The campus must link with regional trail systems. New transit is also essential. This includes both internal shuttle loops with fifteen minute headways, and reinforcing State Street as a major transit corridor linking the University with the Village, Wabash Landing, and downtown Lafayette.

Programmatically, the University has already crossed State Street, but the street currently divides the campus north and south. By diverting traffic from this central roadway, a perimeter parkway will allow for the transformation of State into a vibrant, connective, mixed-use corridor.

The Tippecanoe County Area Plan Commission has adopted a transportation plan which includes the phased implementation of the perimeter parkway. While the basic tenets of the plan are sound, several changes are recommended. The most important of these is that the interior of the perimeter parkway should include the Village. The fabric of the Village serves a unique function for the University. The Village's retail and residential activity must be strengthened and protected so that the Village becomes a destination rather than a transportation corridor. This requires that connections between the Village and the campus be reinforced, and not undermined by the introduction of a potentially divisive oneway road system.

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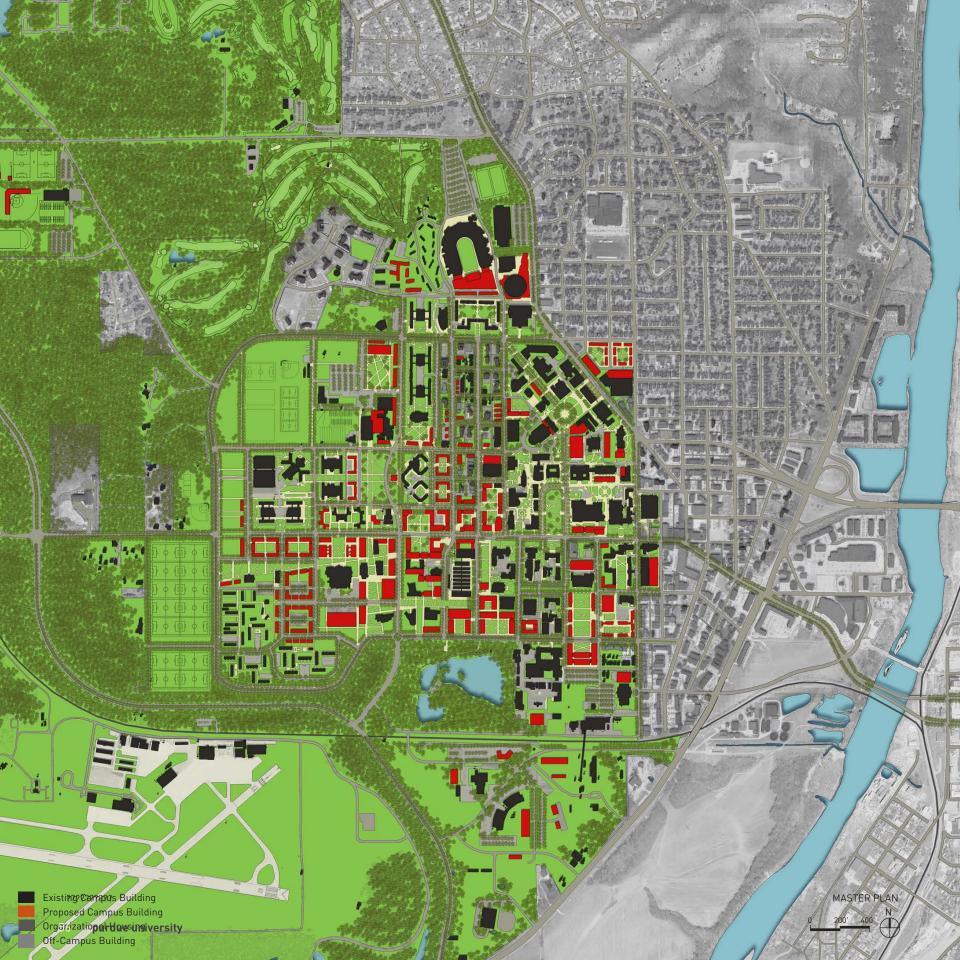


#### Principle 5: Preserve the Western Land

#### The ecological benefits from preserving the University's western land holdings are significant, and argue strongly against continued westward sprawl

The campus' general westward sprawl should be reconsidered in light of the significant infill opportunities available in the campus core. The green fields west of McCormick and Airport Roads should be protected and preserved.

The Western Lands, instead of serving as University growth space, need a single coherent sustainability strategy centered on enhancing hydrological functions and reforestation. This strategy must be integrated with a larger regional concept that ensures the future health of the entire Wabash River Valley



## MASTER PLAN

### Connections to New Synergies

The core principles of the master plan are integrally linked to the strategic plan.

The strategic plan calls for the facilitation of collaboration. The master plan realizes this by transforming State Street into a unifying "corridor for collaboration," by minimizing sprawl, and by concentrating campus activities to create a vibrant community.

The strategic plan calls for the creation of a living laboratory. The master plan realizes this by shaping the campus' physical environment in a mutually supporting way for the purposes of research, habitat, and recreation.

The strategic plan emphasizes sustainability. The master plan responds by engaging the campus' ecological function, encouraging environmental stewardship, and promoting quality of life considerations including the enhancement of the existing trail system.

The strategic plan calls for the fostering of community. The master plan realizes this by creating mixed-use neighborhoods, connecting the campus to the cities of West Lafayette and Lafayette, and demystifying the road system.

Finally, the strategic plan emphasizes student and faculty recruitment, success, and retention. The master plan responds by enhancing Purdue University's sense of place, creating a nurturing, supportive environment that not only makes a good first impression, but more importantly, functions as a home for the entire Purdue family, ensuring the University's continued success well into the twenty-first century.



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PROPOSED PROGRAM DISTRIBUTION

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## PROGRAM

#### Academic-Instructional Space

Future classroom and instructional space will be located in proximity to the historic academic core, but will extend south to State Street, creating a nexus of activity along this central spine. These new academic facilities will connect back to the historic academic core through a series of diagonally stepping quads, allowing students to move quickly within class change intervals. New buildings will employ sustainable design to establish the campus as a living laboratory for environmental innovation.

#### Academic-Research Space

Future research space will be located within Discovery Park, in the area south of State Street, and extending east along Harrison Street. This location acknowledges the recent investments made in Discovery Park and enhances it as a world-class center for research, innovation, and partnerships.

#### **Residential Space**

Future residential space is planned for four key areas. New residential communities will be established in the northeast and southeast, with additional facilities planned in the existing residential communities of the northwest and southwest. The result is a series of residential districts that surround and support the academic core of the campus, adding 24-hour vitality throughout the campus.

#### **Collaborative and Athletic Space**

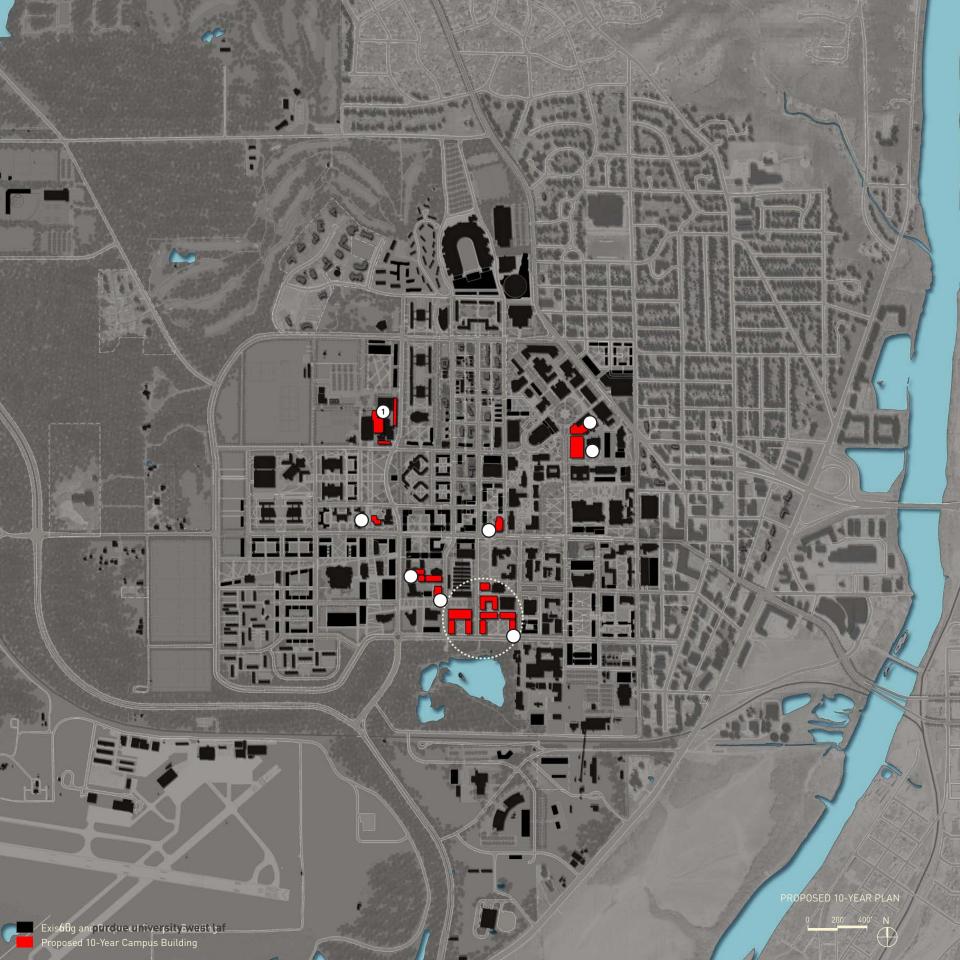
Future collaborative space is planned throughout the campus to support and enhance the academic and residential communities. This includes collaborative and meeting space in Discovery Park, a new dining facility in the southeast and in additional space along State Street, and increased indoor recreation space in the northwestern portion of campus. Additions to the Stadium and Mackey Arena will provide additional space for athletics

#### Support and Auxiliary Service Space

Future space for facilities-related buildings will be in the district shown south of the Quarry. This location allows the core academic related functions the ability to expand in the heart of the campus in the long-term. A potential fire/police station is sited at the corner of Stadium Avenue and Jischke Drive.

#### Parking

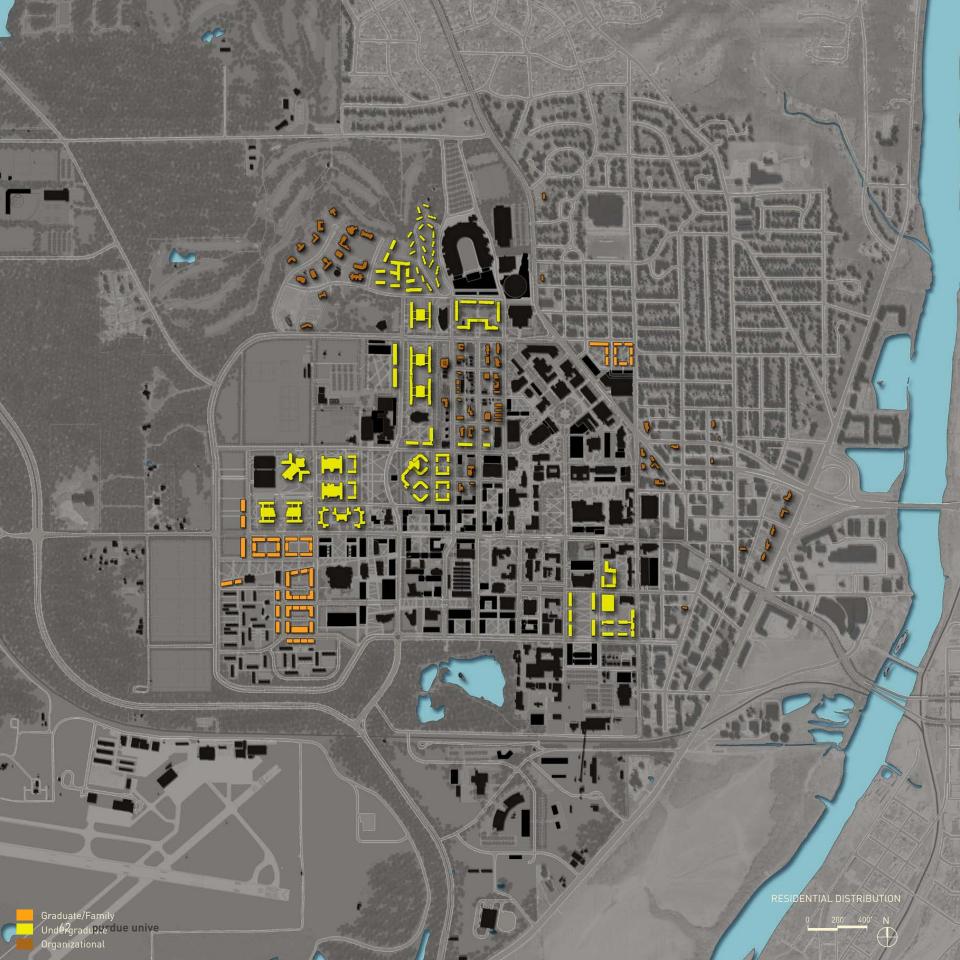
Future parking facilities will be distributed throughout the campus to provide enhanced access to previously under-served areas. Discovery Park and the area around Elliott Hall, in particular, will benefit from additional parking and improved access. Specific locations of garages may vary as a result of the future transportation study.



# **10 YEAR PLAN**

Purdue University has identified a list of projects on its 10-year Capital Request to the State. Possible locations for these projects are identified on the map on the left and summarized in the list below.

- 1. Student Fitness and Wellness Center (addition and renovation to Recreational Sports Center)
- 2. Gatewood Addition (Mechanical Engineering)
- 3. Classroom/Library
- 4. Hanley Hall (Replacement Child Development and Family Studies Building)
- 5. Marriott Hall (Hotel and Tourism Management)
- 6. Herrick Laboratory Replacement, Phases I, II, and III
- 7. Wang Hall (Electrical and Computer Engineering)
- 8. Life Sciences Facilities
- 9. Large Animal Hospital (off map)



# RESIDENTIAL

Residential life is a critical component of the student experience at Purdue University, and a focus of the new campus strategic plan. For these reasons, residential life is central to the long-term success of the master plan which sets the goal of having residential communities in each quadrant of the campus. This requires the creation of new residential communities in the northeast and southeast, and the reinforcement of existing populations in the northwest and southwest. Each quadrant also requires a major open space, and residential life facilities must play a significant role in anchoring these spaces in the southeast, southwest, and northwest.

A comprehensive University Residences master plan is available as a companion document (See the Executive Summary in Appendix), but the key planning strategies are as follows:

- The creation of a major new residential zone in the southeast portion of campus proximate to the Village with a new dining facility.
- 2. The augmentation of the existing residential zone by the strategic insertion of new facilities on key corridors like Third Street.
- The renovation of existing low-rise "H"buildings to ensure their usefulness for the next 25 plus years.
- 4. A phased approach to reinvestment in Purdue Village, initially focusing on the critical State Street corridor, and then moving into the interior of the complex. A significant portion of the existing Purdue Village should be retained to ensure the availability of affordable units, primarily for those students with families who require relatively low cost housing and who benefit from the residential life programs offered to students with families.
- 5. In the long term, creation of a new graduate village close to the academic core in the Hayes Triangle.

Of these, the creation of the new residential community in the southeast portion of campus should be the first priority. As noted in the analysis chapter, this neighborhood is particularly underserved with regards to University Residences, yet, given its proximity to the Village, it represents enormous potential. Anchoring the development of the south campus by the creation of a new residential village should be a strategic imperative which will significantly advance the University's implementation of the overall master plan.

# SURROUNDING COMMUNITIES

The University should collaborate with the cities of West Lafayette and Lafayette, as well as with the County, to the benefit of all parties to discourage car-driven suburban sprawl, encourage in West Lafayette stable owner occupied neighborhoods adjacent to the University, and strategically direct rental housing and mixed-use development.

As the campus grows, it places increasing development pressure on its neighbors. The community's chief concerns are:

- The intrusion of rental housing into owneroccupied family neighborhoods
- The preservation of the character of the Village and the determination of the right mix of uses there
- The impact of the proposed transportation plan
- The implementation of City's plans for future trails
- The compatibility of Purdue's master plan with the Wabash River Corridor Master Plan being developed by the Wabash River Enhancement Corporation.

For the University, the quality of life on and off campus is essential to attracting students, faculty and staff. This requires stable neighborhoods close to campus offering good schools, a lively campus town with shops, and a varied supply of housing types. Many of these elements exist in proximity to the university's major gateways, and significant potential exists for further reinforcement, particularly along the State Street corridor. Past experiments with piece-meal suburban-style commercial expansion to the west of campus have not been successful.

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Existing Thoroughfare/Potential Perimeter Parkway

Proposed Perimeter Parkway

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- Existing Interior Street
- Proposed Interior Street Proposed Limited Access Street
- Existing Structured Parking Potential Structured Parking

PROPOSED MASTER PLAN TRANSPORATION SYSTEM



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# TRANSPORTATION

### **Overview**

Transportation planning at Purdue takes place within a context of regional transportation plans adopted by governmental agencies with input from the University. Revisions to the alignment and configuration of US and state routes as well as local arterials running through West Lafayette are proposed in the current transportation plan for Tippecanoe County. For example, US 231 is proposed to move into a new corridor running south and west of the campus, resulting in the reduction of through-traffic on city streets. In addition, a new parkway around the campus is proposed to enhance efficiency of travel to campus destinations while reducing traffic in the academic core of campus.

### **Circulation Plan**

The Transportation Plan for Tippecanoe County is a county-wide planning document which identifies potential transportation projects to improve travel throughout the region. All changes to the Transportation Plan for Tippecanoe County must be made through an approval process that is facilitated by the Area Plan Commission of Tippecanoe County. Changes to the plan can only be made by addendum or as part of the regularly scheduled updates that occur on a 5-year cycle. This process is important in order to create and maintain a comprehensive and mutually beneficial transportation strategy for the entire county.

The master plan challenges the University to rethink some of the premises of the existing transportation plan for the Purdue University area such as the following:

# 1. Assess the viability of making State Street two-way along its entire length.

The Master Plan relies on a new concept for State Street, making it the campus's unifying element instead of the barrier it is today. Ultimately, when the relocation of US 231 is completed State Street will revert to local control and could take on a character that is more emblematic of a campus street. Planning for these enhancements to State Street can begin when the Perimeter Parkway progresses to the point that traffic can be diverted off State Street to the parkway. With the construction of the Perimeter Parkway and the realignment of US 231, regional traffic will be redistributed from State Street to the periphery of the campus. As a result, State Street can become the central spine joining the campus north to south, allowing the campus south of State Street to assume a stature comparable to the academic campus north of State Street. In the short term, making State Street two-way may require extra measures to ensure safe and efficient traffic operations, such as the prohibition of left turns from State Street eastbound onto Northwestern Avenue, and the signalization of the Chauncey/State intersection, which is consistent with what is proposed in the existing transportation plan.

#### 2. Restore two-way streets wherever practical within the Purdue University area.

The expectation is that restoring University, Waldron and Russell Streets to two-way traffic will reduce confusion, promote efficiency of travel and not significantly compromise levels of service for vehicular operations in this district. Further analysis is recommended.

#### 3. Shift the proposed limited access section of State Street from the middle of campus to the west end between McCutcheon Drive and Airport Rd.

The de-designation of State Street as a state highway, and the corresponding development of the perimeter parkway as a campus bypass with easy access to consolidated parking facilities, is expected to greatly reduce the volume of vehicular traffic on State Street. To reinforce this, the master plan recommends a partial closure of State Street at the west end of campus, between McCutcheon Drive and Airport Road, creating, in effect, a "circuit breaker" to through-traffic. This section of State Street would remain available for emergency vehicles and mass transit.

#### 4. Maintain the existing traffic pattern between Stadium Avenue and Cherry Lane and eliminate the proposed extension of Jischke Drive north of Tower Drive.

The existing transportation plan proposes the extension of Jishke Drive north of Tower Drive to Northwestern Avenue through the existing Hilltop Apartments Complex. The existing one-way pair of University Street and Beering Drive on either side of the Stadium appears to function well as it currently exists. Delineation of the road edges on either side of the Stadium parking lot will enhance the streetscape, provide clear separation from the parking and improve travel in the area. Long range plans for university residences indicate a need for future improvements to housing stock in this area providing another reason for reconsideration of the extension of Jischke Drive north of Tower Drive.

### 5. Assess the feasibility of using existing River Road as the east leg of the proposed perimeter parkway in lieu of the proposed north-south one-way street pair through the Village.

The existing transportation plan proposes a one-way street system through the Village as the east leg of the perimeter parkway. This reinforces the separation of the Village from the campus rather than creating a seamless transition between the districts. A more intuitive, two-way traffic pattern could encourage revitalization of the Village as a vibrant and diverse campus town that is a destination for the entire community rather than a retail area providing for a limited demographic divided by two, one-way through routes.



SCHEMATIC SKETCH OF FUTURE STATE STREET, VIEW EAST FROM JISCHKE DRIVE

### **Character of State Street**

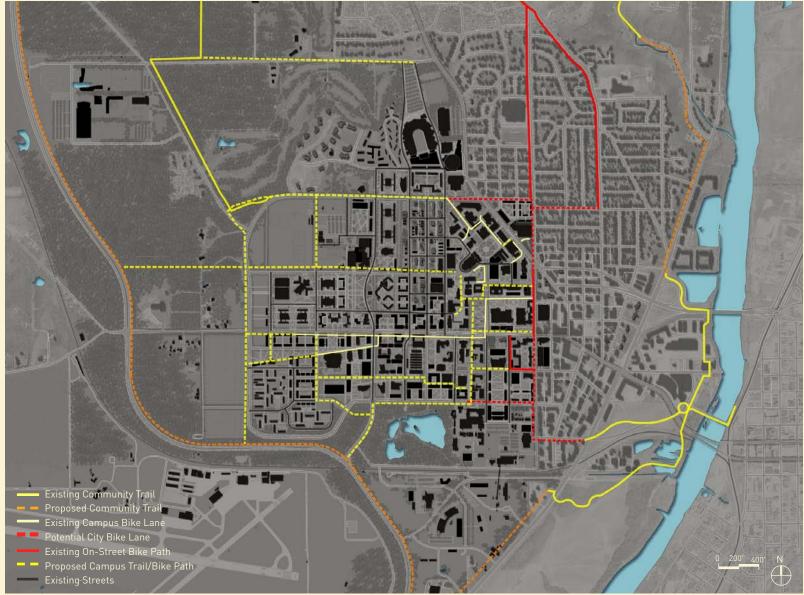
Today, State Street looks and functions like the state highway that it is. Under the Master Plan and the recommended changes to the Transportation Plan for the Purdue University area, State Street could be more like other great 'campus main streets'. such as Tower Road at Cornell, Speedway at the University of Texas at Austin, State Street at the University of Michigan, and Osborn Drive at Iowa State University. The street's design can respond with broad sidewalks, safer, more plentiful crossings, and increased numbers of shade trees. The master plan's proposal for a four-lane cross-section would house two lanes of moving traffic with the possibility of parallel parking on both sides. Future and existing buildings along State Street would frame significant open spaces, creating a strong sense of place and architectural opportunity. The master plan also recommends imposing traffic calming measures along the portion of State Street that runs through campus. This includes short-term strategies such as signage and landscaping that reinforces campus identity, and well-marked crossings. When State Street is downgraded, additional strategies like at-grade plazas and crosswalks, and a consistent road width and design expression, can be implemented.

Befitting its new role as the campus' unifying axis, State Street could be a grand, tree-lined street with active pedestrian life along and across it. Focusing future development along the State Street corridor will generate pedestrian activity, even as vehicular traffic decreases, creating a vibrancy, vitality and synergy that embraces the vision established in **New Synergies**.

### **Village Circulation**

The initiative to simplify the campus street system by removing one-way regulations where practical is equally valid in the Village. Because the existing pattern of one-way streets in and around Purdue hinders both regional and local wayfinding, the changes recommended for the campus may also be instituted in the Village. While a more intensive study of the Village area is recommended, the alternative pattern could:

- Route regional traffic around the Village to establish the Village as destination
- Reestablish simple, direct, two-way street function where possible, and use one-way streets judiciously through the Village
- Take into account the quality, safety and economic importance of the pedestrian experience in the Village and its surrounding districts.



PROPOSED REGIONAL TRAIL SYSTEM

### **Regional Trail System**

The city of West Lafayette has an existing regional trail system with plans for expansion. The master plan recommends that the campus make every effort to connect to the city's trail system to provide greater regional connectivity, particularly to the Wabash River and other recreational, economic or cultural destinations. The current system of streets and bike paths on the Purdue campus should tie into this larger network, particularly the central spine that is State Street. This can be done by designating a trail along State Street for walkers, runners, and cyclists or by distinct signage and wayfinding strategies. Other major thoroughfares, such as Third Street, should maintain a distinct lane for bicycles with clear designation to signal to cyclists and vehicles. In the academic, research and residential districts of campus, on street lanes should connect to existing campus bike paths like those in Academy Park, Purdue Mall and Discovery Park to create a holistic system of circulation on campus. Every effort should be made to make bicycle circulation on campus a safe and convenient transportation alternative that is compatible with other modes of transportation. Bicycle parking facilities and their usage should continue to be monitored and adjusted annually to accommodate demand. Critical east-west bicycle routes that connect the academic campus to existing and future City trails should be encouraged along Stadium Avenue, Third, State and Harrison Streets. Future bike routes along Airport / McCormick Roads, Jischke Drive, Russell and University Streets as well as Oval Drive and Memorial Mall Drive / Marsteller Street will accommodate major north-south connections to Harrison Street, Stadium Avenue and future City trails proposed along Cherry Lane and the relocated US 231 and the City's new Western Interceptor Sewer line.

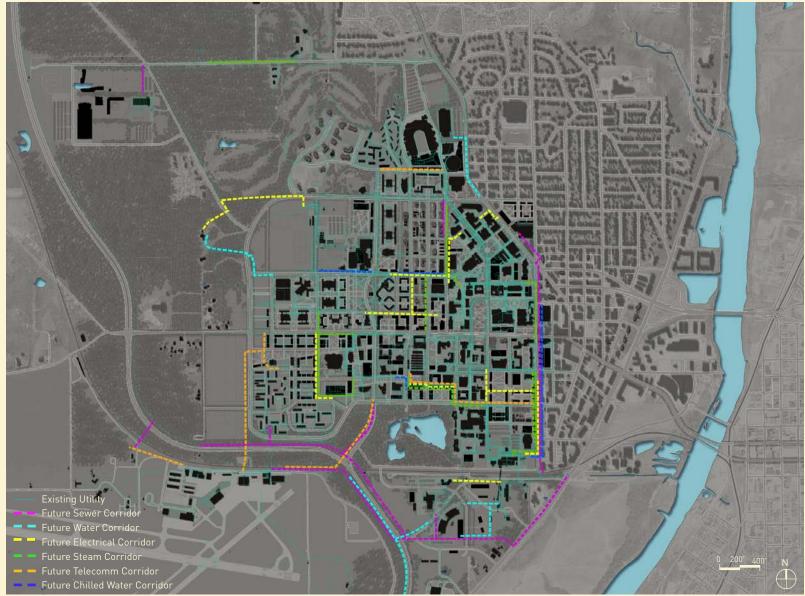
### Parking, Transit and Service

The Master Plan makes provisional recommendations about the location and capacity of new parking facilities, the operation of transit services on campus, and the general issue of transportation demand management (TDM). These topics are the subject of a Purdue Parking and Transportation Demand Management Study, which will supplement the Master Plan when completed. The location of future parking will be based on:

- The number of spaces displaced in the course of campus development
- The life span of campus garage structures and the eventual need to replace the older garages.
- The surplus of existing spaces
- The redistribution of parking to districts where need exceeds capacity

The TDM element of the study will investigate the opportunities to reduce auto-dependence among Purdue's employees, students, alumni, and visitors. Measures being considered include expanded or revised transit services, parking permit regulations, bicycle facilities and public programs such as rideshare matching, guaranteed ride home, and cooperative efforts with off-site parties to establish parkand-ride opportunities.

Based on feedback from the committee and stakeholders, the master plan recommends an internal transit loop to serve the campus population. The intent of the shuttle is to provide greater campus connectivity by providing service between the four primary districts of campus. This internal shuttle loop will allow faculty, staff, and students to park once and then navigate campus efficiently, thereby reducing unnecessary vehicle trips. Further study will be required to determine the logistics and infrastructure needs for such a loop

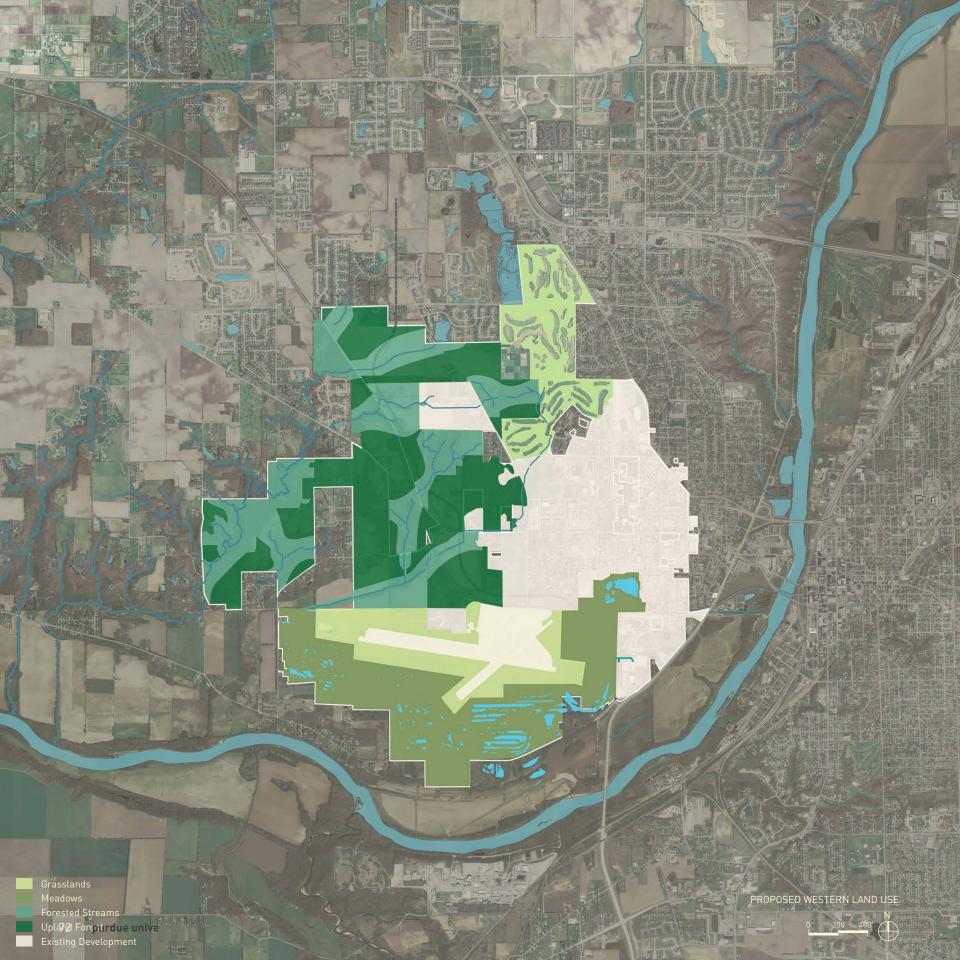


PROPOSED UTILITY CORRIDORS

# UTILITIES

Sasaki recommends keeping new building construction out of primary existing utility corridors.

The goal is to impact the least number of utilities within the master plan's framework, and to establish consolidated utility corridors throughout the campus. All new utility lines will connect into the existing system. Future buildings were sited in accordance with existing and planned utility corridors.



## WESTERN LANDS

The master plan proposes a reorganization of land uses to reconnect forest fragments within the western lands. Increasing contiguous forest cover will enhance the campus entrance, provide research opportunities, improve the habitat value of the land, reduce maintenance costs, protect the campus's drinking water supply, and improve greater watershed conditions.

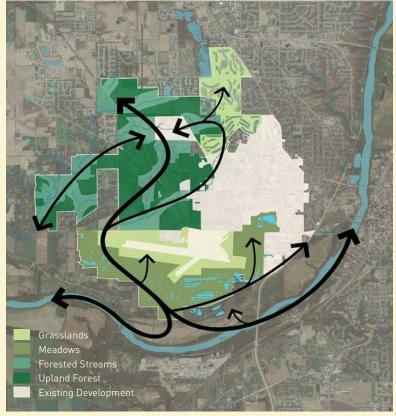
The western lands will increasingly be used as a major campus entrance as a result of the relocated US 231 project. Creating a forested greenbelt within the western lands would provide a defined entry experience as visitors pass through the forests to the core campus. In addition, the landscape massing and species selections will follow a gradient of formality that increases as visitors enter the campus through the forests. Small wildlife underpasses integrated into US 231 would greatly enhance the connectivity of the greenbelt and allow for wildlife movement.

Increasing the forested area within the western lands would have large benefits for both surface water runoff and aquifer protection. Forest cover increases within the western lands could reduce current rainwater runoff volumes by up to 52% due to the ability of forest floor to infiltrate rainfall during storms. These forests would also reduce the velocity and sediment loading of runoff within the existing tributaries and cool the waters, resulting in improved aquatic habitat and cleaner discharges to the Wabash River.

Forest cover is ideal for groundwater protection. The creation of additional forests would increase the area of land covering the Purdue University wellhead 5-year travel time from 97 acres to 237 acres (144% increase), thereby reducing the risk of groundwater contamination from toxic spills. Reducing the surface runoff and the risk of groundwater contamination are two ways the western lands could benefit the greater Wabash River watershed. A network of contiguous forests and grasslands will increase breeding and foraging habitat for native flora and fauna. The forested greenbelt will create greater landscape connectivity, thereby supporting wildlife movement and population changes. In addition, contiguous forest areas will increase the amount of interior habitat within the western lands from 150 to 1,012 acres. Interior habitats are valuable because they contain fewer invasive species and create conditions ideal for a native flora and fauna.

Creating a cohesive landscape pattern within the western lands would also provide the university with an extended recreation area that extended westward from the golf courses and the intramural fields. The diversity of forest and grassland types within the western lands would support recreation trails and natural areas that provide visitors with a range of outdoor experiences.

The proximity of the western lands to the core campus makes them ideal for supporting both graduate and undergraduate research. As part of the land-grant system, the western lands could provide research opportunities across a broad range of disciplines such as bioenergy, entomology, forestry, ecology, and biology.



POTENTIAL HABITAT CORRIDORS



POTENTIAL REGIONAL TRAIL LOOPS



EXISTING INTERIOR HABITAT



POTENTIAL INTERIOR HABITAT



# CAMPUS DISTRICT STUDIES



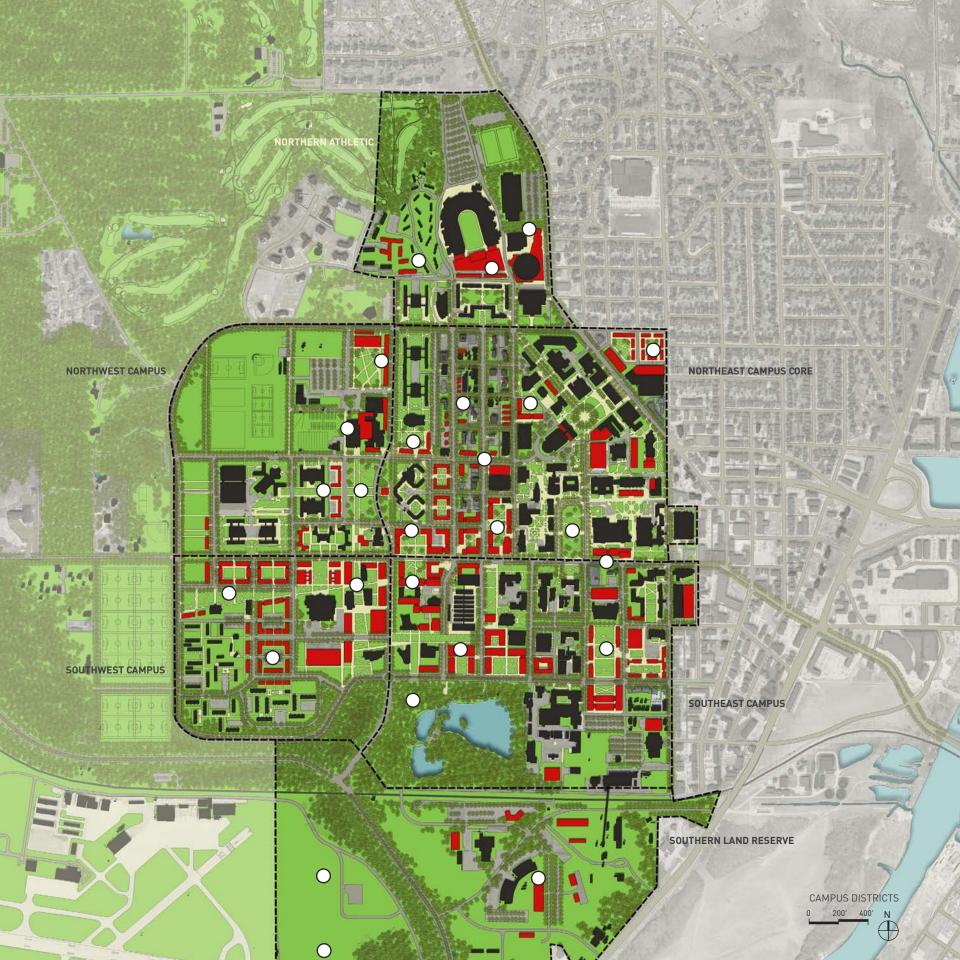




# **DISTRICT STUDIES**

The Purdue University campus consists of 6 districts (boundaries are illustrated on page 80):

- Northeast Campus Core
- Southeast Campus
- Northwest Campus
- Southwest Campus
- Northern Athletic
- Southern Land Reserve
- Each district has a unique character, anchored by an iconic open space.



#### **Northeast Campus Core**

- 1. Transparent Building Facades along State Street
- 2. Active Third Street Corridor
- 3. New Academic Quads leading to State Street
- 4. Restored Memorial Mall
- 5. Vawter Field Residential
- 6. Enhanced Access to Elliott Hall
- 7. Hayes Triangle Residential
- 8. North State Street Quad
- 9. Small Scale Island Infill

#### Southeast Campus

- 10. Recreation at Quarry
- 11. Residential Learning Communities
- 12. Active Research District
- 13. South State Street Quad

#### **Northwest Campus**

- 14. Recreation Facilities
- 15. Iconic Open Spaces
- 16. Meredith Replacement Residential
- 17. Jischke Drive Residential

#### **Southwest Campus**

- 18. Connective Green Spaces
- 19. Discovery Park Extension
- 20. Purdue Village Residential

#### **Northern Athletic**

- 21. Mackey Complex
- 22. Athletic Complex Enhancements
- 23. Hilltop Residential

#### **Southern Land Reserve**

- 24. Parking Courts
- 25. Large Scale Research
- 26. Physical Facilities Complex

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### NORTHEAST CAMPUS CORE

The Northeast Campus Core is the historic heart of Purdue University. As such, future development in this district is designed to celebrate the existing historic buildings and open spaces, including Memorial Mall which can be restored as a celebrated open space. Programmatic additions include new and replacement academic facilities as well as the potential for additional conference and meeting facilities that front State Street, creating an anchor of activity along this important corridor. Further west along State Street, a series of new academic quads provide additional learning space. These academic quads connect back to the campus core along a diagonal series of stepping courtyards. The Third Street corridor is activated by new mixed use facilities which support student life and possibly housing. The addition and renovation of the recreation center serves as the anchor to this important corridor. Improved access and parking facilities are also envisioned for this district, notably around Elliott Hall, where possible solutions include a below-grade garage.



#### Transparent Building Facades Along State Street

1. Morgan State University Student Center, Baltimore, MD

#### Active Third Street Corridor

1. Telegraph Avenue, Berkeley, CA



#### New Academic Quads Leading to State Street

1. Harvard Law School Quad, Harvard University, Cambridge, MA

2. Harvard Science Quad, Harvard University, Cambridge, MA

3. Sketch of Future Quadrangles



#### Restored Memorial Mall

1. The Oval, Ohio State University, Columbus, OH

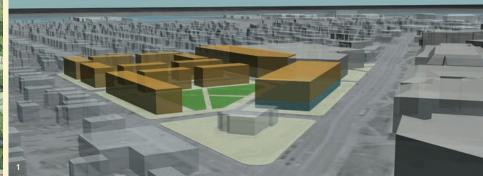
2. University of South Carolina, Columbia, SC



#### Vawter Field Residential

- 1. Bethel University Residence Hall, Arden Hills, MN
- 2. Sakowich Campus Center, Merrimack College, North Andover, MA
- 3. Model of Future Housing, Purdue University Housing Study





**Enhanced Access to Elliott Hall** 

1. Sketch of Future Green

#### Hayes Triangle Residential

1. Model of Future Housing, Purdue University Housing Study



#### North State Street Quad

Harvard Yard, Harvard University, Cambridge, MA
 Sketch of Future Quadrangle

9 Small Scale Island Infill

1. Sketch of Future Small Scale Island Infill

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### SOUTHEAST CAMPUS

The Southeast District of campus is located directly south of State Street. The easternmost portion of this district is characterized by new residential and dining facilities arranged around a central open space. This creates a zone of on-campus student residences located near academic and research facilities as well as the Village retail area. In the southernmost portion of the district, the Quarry is proposed for passive recreational use for the campus community once physical modifications to the pond are completed. A major new south facing complex of research facilities above the Quarry connects Discovery Park with the major academic function of the campus. The existing Discovery Park will benefit from new state-ofthe-art collaborative and meeting facilities, as well as convenient visitor parking, resulting in a user-friendly campus destination.



#### Recreation at Quarry

The Parlament, Museum Island Hombroich, Germany
 Jacob's Pillow Trail System, Becket, MA

**11** Residential Learning Communities

1. Model of Future Housing, Purdue University Housing Study



#### **12** Active Research District

1. James H. Clark Center, Stanford University, Palo Alto, CA

- 2. Kursaal, San Sebastian, Spain
- 3. Lorain Community College, Elyria, Ohio

13 South State Street Quad 1. Sketch of Future Quadrangle



### NORTHWEST CAMPUS

The Northwest District will benefit from improvements to student life and housing. The existing recreation center will undergo an addition and major renovation. This addition, envisioned as a transparent façade, will activate the corners of Third Street and Jischke Drive by displaying the student activities occurring within. Additional parking could be provided for this facility. New intimately scaled residences will be close to existing residential units and front a large new open space along Jischke Drive that can be used for recreation purposes. A combined fire/police station could be located at the corner of W. Stadium Avenue and Jischke Drive. This location is proximate to both student residences and the academic core. Overall, development in this district recognizes and avoids the sensitive lands surrounding the well fields.



#### Recreation Facilities

- 1. York College Sports Facility, York, PA
- 2. Hemenway Gym, Harvard University, Cambridge, MA
- 3. Rendering of Future Wellness Center , Drexel Univeristy, Philadelphia PA

#### 15 Iconic Open Spaces

1. Central Quadrangle, University of Illinois, Champaign, IL



#### Meredith Replacement Residential

- 1. Potomac Heights Student Apartments, George Mason University, Fairfax, VA
- 3. Barksdale Student Housing, College of William and Mary, Williamsburg, VA

- Jischke Drive Residential
  - 1. Model of Future Housing, Purdue University Housing Study



### SOUTHWEST CAMPUS

The Southwest Campus district will remain home to research and student residences. New research facilities along the south side of State Street will complete Discovery Park and then extend southward to Harrison Street. A phased renovation approach to Purdue Village will first concentrate new graduate residences along State Street. New student housing will open into courtyards that serve both active and passive recreation purposes and be clustered along a connective green space.



#### Connective Green Spaces

- 1. Sketch of Future Quadrangle
- 2. Penn State University Mall, State College, PA
- 2. The Grove, University of Mississippi, Oxford, MS



#### Discovery Park Extension

1. Student Resource Building, University of California, Santa Barbara, Santa Barbara, CA

#### Purdue Village Residential

Mulberry Street Housing, University of Scranton, Scranton, PA
 Model of Future Housing, Purdue University Housing Study

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### NORTHERN ATHLETIC CAMPUS

The Northern Athletic district, of which the Stadium and Mackey Arena are a part, will continue to serve as the hub of major athletic activity on campus. Mackey Arena will undergo an addition to improve the athletic department's programmatic needs and enhance spectator amenities. Adjacent to this facility, the University is working to identify best management practices (BMPs) for stormwater, including its retention below the outdoor practice fields. This area will also see the potential addition of new housing in the existing Hilltop apartment complex, further emphasizing the desire to not extend Jischke Drive through this area.



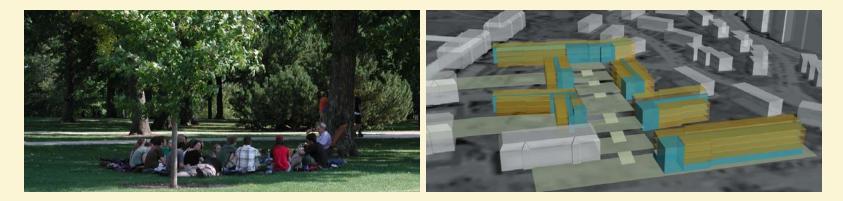


#### Mackey Complex

1. Rendering of proposed Mackey Complex Addition, HNTB Architecture

Athletic Complex Enhancements

1. Sketch of Future Addition



### Hilltop Residential

- 1. Buntrock Commons, Saint Olaf College, Northfield, Minnesota
- 2. Model of Future Housing, Purdue University Housing Study



## SOUTHERN LAND RESERVE

The Southern Land Reserve will be used for the future expansion of facilities service-related buildings. In the long-term, this district can also accommodate future large scale research facilities as well as supply long-term and overflow parking needs. The reserve has the capacity to accommodate 4 million square feet of research space and 7,000 cars.



### Parking Courts

- 1. Parking Court, Bryant University, Smithfield, RI
- 2. Parking Court, Dia Beacon, Beacon, NY
- 3. Parking in Woods, University of Richmond, Richmond, VA

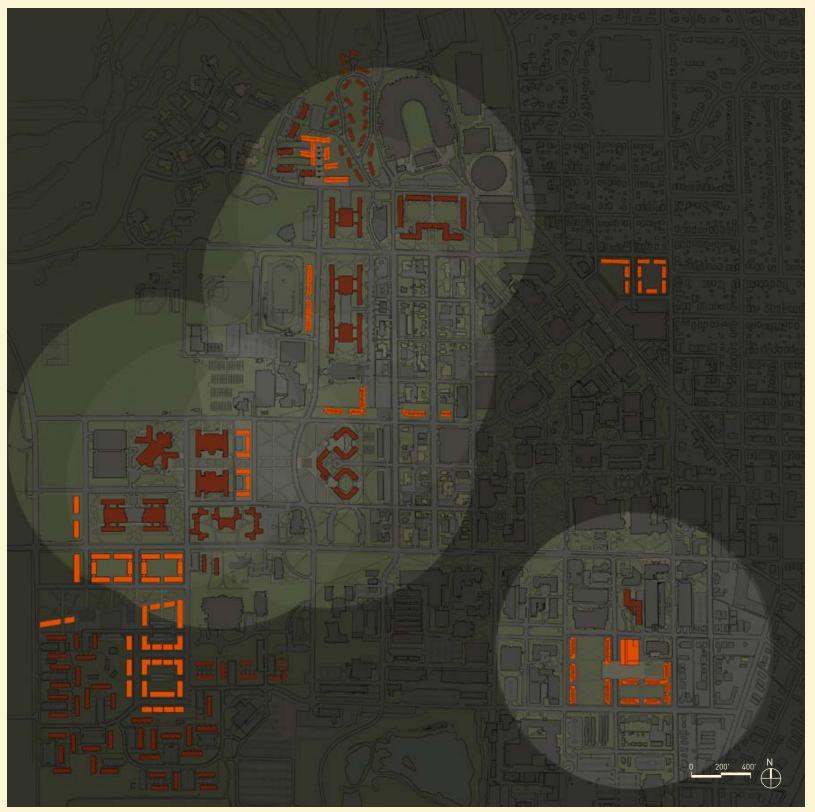


### Large-Scale Research

1. Bowen Lab for Large Scale Civil Engineering Research, Purdue University, West Lafayette,  ${\sf IN}$ 



# APPENDIX



HOUSING MASTER PLAN

#### Housing Master Plan Executive Summary

Residential life is a critical component of the student experience at Purdue University, and a focus of the new campus master plan and strategic plan.

A large percentage of University Residences is comprised of older buildings posing significant questions on appropriate reinvestment and with a significant percentage of rooms on double-loaded corridors with "gang" bathrooms. Although University Residences typically open at 100% occupancy for the start of each fall semester, it is recognized that retaining upper-classmen in the future will be increasingly difficult due to the nature of the housing inventory.

For these reasons, University Residences collaborated with Sasaki Associates to develop a comprehensive plan for capital investment, emphasizing the location and typologies of potential new housing units, and a complimentary renovation strategy to extend and enhance the life of existing buildings.

Three implementation scenarios are outlined, depending on available capital. These scenarios range from a minimum maintenance program, to the addition of 1,800 net new beds. The report also provides long-term strategies which could potentially net up to 3,500 new beds.

Before recommending specific interventions, Sasaki conducted a thorough analysis of existing conditions. The key findings were:

- The primary obstacle to the retention of upper-classmen is the lack of diversity in typologies offered.
- 2. The housing stock is, with only one exception, concentrated towards the western edge of campus. Providing more geographic variation is critical.
- To a large degree, existing housing is not geographically-integrated with the campus' academic and research buildings.

4. The existing housing stock is, by-and-large, in need of upgrades to remain competitive with the market.

The new campus master plan sets the goal of having residential populations in each quadrant of the campus. This requires the creation of new residential communities in the northeast and southeast, and the reinforcement of existing populations in the northwest and southwest. Each quadrant also includes a major open space, and new residential life development should be oriented to take advantage of these spaces in the southeast, southwest, and northwest.

At the same time, the best possible use should be made of existing facilities, particularly dining halls and the soon to be augmented recreation facilities on Jischke Drive. This means that the freshman (and to a lesser extent sophomore) residential experience should be focused in the current residential zone. The new zones should, for the most part, provide opportunities for upper-classmen, and increase the inventory of on-campus rooms targeted toward graduate students.

Several strategies are presented to achieve these goals. Broadly speaking these strategies are:

- The creation of a major new residential zone in the southeast portion of campus proximate to the Village with a new dining facility.
- 2. The augmentation of the existing residential zone by the strategic insertion of new facilities on key corridors like Third Street.
- The renovation of existing Low-rise "H"buildings to ensure their usefulness for the next 25-plus years.
- 4. A phased approach to reinvestment in Purdue Village, initially focusing on the critical State Street corridor, and then moving into the interior. A significant portion of the existing Purdue Village should be retained to ensure the availability of affordable units, primarily for married international students.

5. In the very long term, creation of a new graduate village close to the academic core in the Hayes Triangle.

A key point of emphasis for the housing master plan is financial realism. Each of the potential intervention strategies will require significant capital investment, not always accompanied by new revenue. Some projects, most notably the development in the southeast quadrant, lend themselves to a developer partnership. However, it is unlikely that the full range of strategies outlined in this report can be implemented in a 25-year timeframe by simply raising room and board rates to provide debt service on the required capital.

The overall goal is to provide a roadmap for University Residences moving forward which ensures they can fulfill their mission, continuing to provide welcoming, nurturing communities which complement the daytime academic activity of the University with 24/7 life, while remaining financially self-supporting.

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