NC STATE UNIVERSITY

A CAMPUS OF
Neighborhoods and Paths

NC STATE UNIVERSITY PHYSICAL MASTER PLAN
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>4</td>
</tr>
<tr>
<td>Overview</td>
<td>5</td>
</tr>
<tr>
<td><strong>Campus Vision</strong></td>
<td>11</td>
</tr>
<tr>
<td>Commitment to the Master Planning Process</td>
<td>11</td>
</tr>
<tr>
<td>Integrated Planning</td>
<td>11</td>
</tr>
<tr>
<td>Hallowed Places</td>
<td>12</td>
</tr>
<tr>
<td>Sustainability</td>
<td>13</td>
</tr>
<tr>
<td>Pedestrian-Oriented Campus</td>
<td>13</td>
</tr>
<tr>
<td>Human-Scaled Neighborhoods and Paths</td>
<td>13</td>
</tr>
<tr>
<td>Campus Safety and Security</td>
<td>14</td>
</tr>
<tr>
<td>Design Harmony</td>
<td>14</td>
</tr>
<tr>
<td>Universal Design</td>
<td>15</td>
</tr>
<tr>
<td>City Context</td>
<td>15</td>
</tr>
<tr>
<td>Mixed-Use Activities</td>
<td>15</td>
</tr>
<tr>
<td>Visible Neighborhood Activities</td>
<td>16</td>
</tr>
<tr>
<td>North, Central, and South Campus Precincts</td>
<td>19</td>
</tr>
<tr>
<td>Contennial Campus Precinct</td>
<td>21</td>
</tr>
<tr>
<td>West Campus Precinct</td>
<td>23</td>
</tr>
<tr>
<td><strong>Guiding Principles</strong></td>
<td>25</td>
</tr>
<tr>
<td>Campus Neighborhoods</td>
<td>28</td>
</tr>
<tr>
<td>Shared Open Spaces</td>
<td>28</td>
</tr>
<tr>
<td>Character Places</td>
<td>39</td>
</tr>
<tr>
<td>Hubs of Interaction</td>
<td>43</td>
</tr>
<tr>
<td>Ecosystems</td>
<td>47</td>
</tr>
<tr>
<td>Buildings and Their Details</td>
<td>51</td>
</tr>
<tr>
<td>Sustainable Design</td>
<td>69</td>
</tr>
<tr>
<td>Campus Paths</td>
<td>75</td>
</tr>
<tr>
<td>Pedestrian Paths</td>
<td>75</td>
</tr>
<tr>
<td>Vehicular Paths</td>
<td>87</td>
</tr>
<tr>
<td>Transit Paths</td>
<td>93</td>
</tr>
<tr>
<td>Parking</td>
<td>96</td>
</tr>
<tr>
<td>Process</td>
<td>103</td>
</tr>
<tr>
<td>Sponsored Programs</td>
<td>103</td>
</tr>
<tr>
<td>Partnerships</td>
<td>106</td>
</tr>
<tr>
<td>Enrollment and Employment</td>
<td>106</td>
</tr>
<tr>
<td>Projections</td>
<td>106</td>
</tr>
<tr>
<td>Space Needs Analysis</td>
<td>106</td>
</tr>
<tr>
<td>Space Standards</td>
<td>107</td>
</tr>
<tr>
<td>Space Efficiency and Space Utilization</td>
<td>107</td>
</tr>
<tr>
<td>Facility Condition and Quality</td>
<td>111</td>
</tr>
<tr>
<td>Six-Year Capital Plan, 2013-2015 Biennium</td>
<td>115</td>
</tr>
<tr>
<td>Neighborhood Systems</td>
<td>119</td>
</tr>
<tr>
<td>Campus Paths and Shared Open Spaces</td>
<td>119</td>
</tr>
<tr>
<td>Hallowed Places, Landmarks, and Public Art</td>
<td>121</td>
</tr>
<tr>
<td>Natural Systems</td>
<td>123</td>
</tr>
<tr>
<td>Mixed Use Activities</td>
<td>125</td>
</tr>
<tr>
<td>Transportation Systems</td>
<td>129</td>
</tr>
<tr>
<td>Vehicular Paths</td>
<td>131</td>
</tr>
<tr>
<td>Parking</td>
<td>131</td>
</tr>
<tr>
<td>Transit Paths</td>
<td>133</td>
</tr>
<tr>
<td>Utility Systems</td>
<td>137</td>
</tr>
<tr>
<td>Domestic and Reuse Water Systems</td>
<td>137</td>
</tr>
<tr>
<td>Chilled Water</td>
<td>139</td>
</tr>
<tr>
<td>Central Steam Distribution</td>
<td>141</td>
</tr>
<tr>
<td>Primary Electric</td>
<td>143</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>145</td>
</tr>
<tr>
<td>History: The Physical Development of NC State University</td>
<td>149</td>
</tr>
<tr>
<td>Process: Master Plan Update 2000 to 2014</td>
<td>157</td>
</tr>
<tr>
<td>Key Terms</td>
<td>159</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>161</td>
</tr>
<tr>
<td>Index</td>
<td>169</td>
</tr>
</tbody>
</table>
Introduction
A Campus of Neighborhoods and Paths
North Carolina State University Physical Master Plan

Letter from the Chancellor
Great universities such as NC State recognize that their mission is both complex and bold: to build an inclusive environment for the creation and application of knowledge and discovery, where excellence is deliberate, and the courage to change is expected. The success of our mission depends upon a solid and reliable foundation upon which our traditions are anchored alongside our aspirations.

NC State University takes great pride in exemplifying our state’s motto, “To be rather than to seem.” We are rooted in the land-grant legacy of practice over pretense, and function over fiction. Towards this end, NC State continues on a pathway to become a world-class research, teaching, learning, and service institution and our continued success will require world-class facilities and surroundings.

NC State University’s updated physical master plan, A Campus of Neighborhoods and Paths 2014, complements our commitment to creating a physical environment that supports our recently crafted strategic plan, The Pathway to the Future. Both documents share a focus on the enhancement of educational innovation, infrastructure, interdisciplinary collaboration, and strategic partnerships. The end result is a setting that inspires a culture of constant improvement, learning, and applied discovery. This culture enlivens our collective effort to address the grand challenges of society.

This physical master plan is an inclusive and encompassing guide for purposeful design. It builds upon a history of success of leveraging growth and change to give rise to new opportunities. Our long tradition of using participative and integrated planning has successfully moved the campus in a coordinated way towards becoming a true Campus of Neighborhoods and Paths.

More than ever, decisions regarding campus growth and change need to follow the master planning process. In the face of limited resources, growth must serve long-range goals of creating neighborhoods that have the ability to adapt to changing demands and foster success based on interaction and collaboration across disciplines. Our facilities can no longer merely “house” activity but must stimulate and encourage it. We must optimize available resources and opportunities effectively and efficiently without compromising university values. This revised physical master plan provides us with the framework needed for NC State to grow and succeed in all of its endeavors.

More than 300 people have participated in updating our Physical Master Plan. The ideas, information, and input from our campus community of students, faculty, staff and off-campus partners have greatly enhanced the strength of the plan. I personally appreciate the time and talent dedicated by everyone who participated in the update of this important document that will lead NC State on a continuing path of excellence.

W. Randolph Woodson, Chancellor
Overview

Why “Neighborhoods and Paths”? The Campus Neighborhood is the basic building block of the campus structure - a place where people live, work, study, and play. The Campus Paths connect those neighborhoods, their inhabitants, and their activities. By building on these ideas, NC State is bringing beauty and a deepened sense of personal connection to campus.

A Campus of Neighborhoods and Paths lays out the future of physical development at NC State University. It presents a way to integrate the many parts of a large, urban campus into a coherent whole. This plan includes guidelines and standards for individual projects and directions for fitting those projects into the overall campus fabric.

The Plan begins with the Campus Vision, the NC State campus as it will become, drawing on the campus’ successful existing parts. All development will advance this Vision. The subsequent Guiding Principles, on which the Vision is built, are the university’s underlying values regarding campus development.

The Precinct Plans are renderings that illustrate the vision for the five planning areas of the campus core: the North, Central, South, West and Centennial Campus Precincts.

Following these are the Design Guidelines and Standards, which begin by presenting the concepts of Campus Neighborhoods and Campus Paths, the fundamental concepts of this plan. The guidelines are conceptual development criteria that every development proposal must address. The architectural, site, and ecosystems standards, which are coupled with their appropriate guidelines, present specific criteria for the design of buildings, the development of the exterior environment, the sensitive management of natural systems, and the ways to integrate them into the campus fabric. By following these guidelines and standards, the many parts of a large campus are woven into a coherent whole that honors the Campus Vision and the Guiding Principles.

The Capital Improvement Plan describes the university’s working projections about its growth and presents proposals for accommodating that growth in coordination with the university’s Strategic Plan. It includes space assignments by categories of use and describes the university’s Six-Year Capital Plan. Plans are presented to illustrate the projected development of the campus based on the Six-Year Capital Plan. The Campus Plans depict many of the concepts presented in the Design Guidelines and Standards as well as other features of campus development, such as utilities and infrastructure. The plans illustrate the vision for the development of these individual systems.

The Appendices contain additional information related to the master plan, including acknowledgments of all who participated in the update, a history of the development of the campus, a description of the exceptional master planning process used at NC State University, and a guide to Key Terms used in the plan.

To find A Campus of Neighborhoods and Paths on-line, please go to:
www.ncsu.edu/facilities/physical_master_plan
Campus Vision

State is a beautiful tapestry of Campus Neighborhoods, Human-Scaled places⁴ where individuals can form a lasting personal connection to this large university. These neighborhoods are diverse in character, organized around attractive, lively open spaces, and developed in ways that encourage human interaction, collaboration and reflection. They are woven into a coherent whole by a system of footpaths, streets, and transit - a pedestrian-oriented network featuring All Campus Paths⁵ that are a distinguishing characteristic of the university.

The built environment shall be of the highest quality, responding to campus and ecological contexts, and contributing to the traditions and missions of NC State University. Each project, however large or small, is a source of pride for the community and measurably moves toward making NC State a better place.

⁴ The design and arrangement of buildings and landscape features to accommodate human perceptions, activity, and social organization. Measures for Human Scale include house depth, stride, readability, and perceptual range.
⁵ The campus’s most human pedestrian movement space, invented for people-powered movement, that connects parts of campus and major University wards with a wide path and pedestrian amenities that create special places. They are to be the sacred axis by which a pedestrian experience is the campus’s core. Over time they will be enhanced and expanded to become a system of connected paths that are a major design characteristic of campus and an outdoor amenity for the university.
The Guiding Principles are used as a framework for each campus development project. By adhering to them, the university creates excellent campus design and measures its progress toward achieving the Campus Vision. Each project fulfills both the Guiding Principles and program requirements to the greatest extent possible. With the understanding that the campus continues to grow incrementally, each project also manifests in such a way that it allows for future growth and change to achieve the fullest intent of the Guiding Principles.

The Office of the University Architect staff, the campus community, building committees, and other project-reviewing bodies use the Guiding Principles as a tool with which to judge each project proposal by its contributions to its neighborhood, the network of paths, the campus as a whole, nearby city neighborhoods, and the natural environment. The Guiding Principles weave together the values generated in the university’s precinct-planning workshops and focus groups with those values developed by the task forces charged with updating the physical master plan. Through the Master Planning Process, the Guiding Principles guide all development on campus.
Commitment to the Master Planning Process

The university is committed to the Master Planning Process. Decisions about space allocation and management, capital priorities, designer selection, building design, and landscape planning, for state owned buildings, as required by Section 100.1.199 Appendix 1 of Chapter 100 of the Code of the Board of Governors of the University of North Carolina, are based on the criteria in a Campus of Neighborhoods and Paths, NC State Physical Master Plan Update 2014. This process and plan are intended to be a framework that inspires excellent design. If the university decides it must modify the plan’s criteria or deviate from its standards in a development project, it will be guided by the Board of Trustees, the Campus Design Review Panel, and campus neighborhood stakeholders. Building on the campus precinct workshop concept, the university will develop a form of Campus Neighborhood consultation. As Design Guidelines specific to each campus precinct are developed, they become supplements to the Master Plan and provide further guidance for project planning.

Integrated Planning

Physical planning enhances the mission of each campus unit as part of a continuous process that works in concert with the university’s strategic, academic, programmatic, space and enrollment plans. This environment stimulates creativity among faculty, students, staff, corporate partners, and visitors to facilitate teaching, learning, research, and extension. The result is a campus that encourages the exchange of ideas and that meets the diverse needs of the people who study, work, and live at NC State.

Hallowed Places

The university is committed to caring for and preserving campus buildings, landscapes, and natural settings that have accrued special meaning over time, henceforth referred to as Hallowed Places. This unique designation is awarded only to those buildings and places that have become irreplaceable because of their historical significance or because over generations they have become symbols of our bond with the university.

Hallowed Places provide an underlying commonality of experience and evoke awe, fascination, and inspiration. These buildings, unique places, and natural resources are cataloged, restored if necessary, nurtured, and celebrated to reflect pride in the university’s heritage and respect for the past. Changes affecting these areas require extraordinary care to preserve their special nature and are considered only in consultation with the campus community.

Guiding Principles

Commitment to the Master Planning Process

Decisions about space allocation and management, capital priorities, designer selection, building design, and landscape planning, are based on the Physical Master Plan, which is derived from a participatory campus-wide effort that is revisited on a regular basis.

Integrated Planning

Physical planning that works in concert with the university’s strategic, academic, programmatic, space and enrollment plans, enhances the mission of each campus unit and encourages the exchange of ideas.

Hallowed Places

Preserving irreplaceable buildings, landscapes, and natural settings that have accrued special meaning over time celebrates the university’s heritage.

Sustainability

Design and construction that creates lasting value for the campus community and the state of North Carolina reduces the university’s environmental impact.

Pedestrian-Oriented Campus

A path and transit network that safely and comfortably links campus destinations reduces dependency on single-occupancy vehicles.

Human-Scaled Neighborhoods and Paths

An environment that is made up of a series of human-scaled units, rather than monolithic spaces or structures, creates a comfortable campus environment.

Campus Safety and Security

Campus buildings, grounds and paths foster a safe, secure and healthy community where people can thrive.

Design Harmony

Architecture that arises from the study of and response to neighborhood context results in strong and attractive visual unity.

Universal Design

The campus is built and retrofitted so that environments are usable by all people to the greatest extent possible.

City Context

Weaving the university into the fabric of surrounding neighborhoods improves the shared, larger community and facilitates mutually beneficial goals.

Mixed-Use Activities

The integration of a variety of activities and functions within neighborhoods encourages interaction and extends the use of space beyond standard class and work schedules.

Visible Neighborhood Activities

Views into neighborhoods and buildings soften the boundaries between places, help to inform people, and invite them to engage with one another.

Guiding Principles

6 Mircea Eliade, The Sacred and The Profane.
Sustainability
NC State is committed to sustainable design and construction that creates lasting value for the campus community and the state of North Carolina. The University’s sustainability commitments ensure the highest quality of stewardship, adaptability for future growth and well-being of the campus community. To reduce the university’s environmental impact, all campus projects include sustainability goals that protect and enhance ecosystems for current and future generations. By creating facilities and landscapes built upon these goals, NC State is a living laboratory and a model of innovative sustainability in the local and global community.

Pedestrian-Oriented Campus
NC State is a safe, inviting, and Pedestrian-Oriented Campus, a master plan strategy for reducing dependency on campus vehicular traffic. Pedestrians are served through a network of paths that safely and comfortably link campus destinations and precints. All Campus Paths, connecting campus Hearths, are major pedestrian zones providing scenic routes with few interruptions by vehicles.

Access for vehicles is thoughtfully planned to enhance pedestrian activity. The speed and volume of traffic is designed to safeguard pedestrian movement. Parking is consolidated at campus perimeters to reduce the number of vehicles entering interior campus streets. Campus improvements will effectively link to other parts of campus and the surrounding community. The University is committed to supporting alternatives to single-occupancy vehicles and to connecting with city and regional transit systems. The University’s transit and parking policies will be sensitive to the quality of life in the surrounding city neighborhoods.

Human-Scaled Neighborhoods and Paths
The environment is made up of a series of human-scaled units rather than monolithic spaces or structures. A Human Scale helps people cognitively map their surroundings, enabling them to acquire, store, and decode information about the environment around them. People form a closer and more satisfying connection to their surroundings when the design of those settings accommodates everyday human activity at the slower speeds of people-powered movement. NC State campus buildings and grounds are designed to meet the needs of people as they interact with each other and the spaces around them. Human-scaled details, designed to fit the human body’s range of motion and the mind’s ability to perceive one’s surroundings, create a campus environment that is comfortable, easily understood, and clarifies wayfinding. Measures for Human Scale include human grasp, reach, stride, mobility, and the distances at which people can recognize and hear one another.

Campus Safety and Security
Campus buildings, grounds and paths foster a safe, secure and healthy community where people can thrive. Proactive design and an integrated approach to security technology standards reinforce a safe and secure environment through appropriate materials, effective lighting and wayfinding, and a comprehensive security infrastructure.

Design Harmony
The campus has a strong and attractive visual unity arising from the blending of the old and new, the Human Scale and architectural detail of the Campus Neighborhoods, and the beauty and coherence of Campus Paths. The architecture exhibits enduring quality and beauty, and new development draws upon the context of the surrounding architecture, scale, materials, and landscape to create or enhance neighborhood unity. While all neighborhoods have unique characters, NC State’s campus is unified and strengthened through the strategic use of Gateways, Portals, and Landmarks. Neighborhoods are woven together with Campus Paths that shape movement through a harmonious collection of buildings and places.
Universal Design
The campus is built and retrofitted to be accessible and understandable by all people, utilizing the standards of Universal Design. "...the design of products and environments to be usable by all people to the greatest extent possible without the need for adaptation of specialized design." New projects are created and facilities and grounds are adapted to make the built environment beneficial to people of all ages and abilities.

City Context
The university will endeavor to integrate the campus into the land use and socio-economic context of the City of Raleigh. It will coordinate with Citizens Advisory Councils, local government, and the business community on opportunities to improve the shared, larger community. The university participates in the local municipal planning process, recognizes that some Campus Neighborhoods overlap with city neighborhoods, and partners with citizens toward mutually beneficial goals.

The university will maintain open, inviting borders, recognizing that the campus is a resource and asset to the surrounding communities and all citizens of North Carolina. NC State will be woven into the fabric of surrounding neighborhoods by campus edges that strengthen the university’s identity while facilitating the flow of people and exchange of ideas between communities.

Mixed-Use Activities
Mixed use is the integration of a variety of activities and functions within neighborhoods, which encourages interaction, communication and the cross-fertilization of ideas. To promote interaction across disciplines and activities, each Campus Neighborhood has a Heart, public space, or facility large enough to draw people from across campus. Dining, residences, lecture halls, galleries, libraries, open spaces, public art, and theaters attract people into neighborhoods, extending the usefulness of the space beyond standard class and work schedules, while creating opportunities for people of diverse backgrounds and disciplines to interact.

Visible Neighborhood Activities
Visibility of Activities within neighborhoods softens the boundaries between places, helps to inform people, and invites them to engage with one another. Windows and transparent interior partitions expose the public activities taking place within entries, lobbies, lounges, and teaching and research spaces. Likewise, the views to exterior activities enhance the quality of interior spaces, and the selection and arrangement of landscape elements contribute to the transparency and views. As a result, the character of each neighborhood is discovered and people move with greater ease, confidence and understanding.

visible neighborhood activities

9. See more, from the website of The Center for Universal Design.
10. Campus gathering areas and social centers, both indoor and outdoor. These may be of various sizes and functions, from the retail areas at University Plaza to the office coffee areas in an above.
Precinct Plans

The Precinct Plans are renderings that illustrate the vision for the five planning areas of the campus core: the North, Central, South, Centennial, and West Campus Precincts. The plans convey the build-out goals for each precinct and indicate the projected siting of future buildings (tan) and roads, among existing buildings (dark brown), as neighborhoods are cohesively developed, enhanced and beautified. Cohesiveness and beauty are brought to all parts of the campus core with the guidance of A Campus of Neighborhoods and Paths. The five precincts now encompass more than two thousand acres. More than thirty-four thousand students study here, and their numbers are growing. NC State University occupies an important place in the life and welfare of the state, and its physical campus is as vital and memorable as the activities it contains.
NORTH, CENTRAL, AND SOUTH CAMPUS PRECINCTS

The Precinct Plans are renderings that illustrate the vision of campus. The drawings give form to the projects highlighted in the 6-Year Capital Plan.

KEY PROJECTS
1. Broughton Hall Renovation & Addition
2. Carmichael Addition & Renovation
3. Dabney Hall Renovation
4. Western Boulevard Pedestrian/Bicycle Tunnel
5. Science Commons Building
6. Varsity Drive Recreation Fields
CENTENNIAL CAMPUS PRECINCT

The Precinct Plans are renderings that illustrate the vision of campus. The drawings give form to the projects highlighted in the 6-Year Capital Plan.

KEY PROJECTS
9. Engineering Building - The Oval
10. Plant Sciences Research Building
11. Town Center
12. Textile Innovation Center
13. Hotel and Conference Center
14. North Shore Residential
WEST CAMPUS PRECINCT

The Precinct Plans are renderings that illustrate the vision of campus. The drawings give form to the projects highlighted in the 6-Year Capital Plan.

KEY PROJECTS
15. Flex Laboratory Building
16. CVM Education Building
17. Indoor Practice Facility
Design Guidelines and Standards

Campus Neighborhoods

People develop their sense of belonging to NC State through its neighborhoods and the activities that occur within them. These neighborhoods feel self-contained, but they connect easily to other neighborhoods and campus places via pedestrian paths. While each Campus Neighborhood is unique, all of the neighborhoods share several characteristics that must be considered in new construction or renovation projects. This section presents design guidelines for those characteristics. Following the applicable guidelines are Architectural Standards, Landscape Standards, and/or Natural Systems Standards with more specific guidance.

Each neighborhood contains a variety of activities that encourage human interaction across groups and disciplines. These may include food service, the facilities of different academic disciplines, libraries, galleries, and so forth. Some neighborhoods may have a predominant function, such as academic, residential, administrative, or service, but all will have features that welcome every person. The Visibility of Activities within neighborhoods invites the interest and engagement of the university community. The character of the Public Domain ensures that public spaces connect to and energize each other to promote human interaction. At its Community Interface, each neighborhood enhances the campus’s relationship with the surrounding community.

The university focuses Campus Neighborhoods around Shared Open Spaces: Campus Greens, Plazas, Courtyards, Neighborhood Streets, Campus Edges, and Natural Areas, all defined below. Each neighborhood is also defined in part by its Character Places: Exterior Hearths, Landmarks, Hallowed Places, and Landscape Features. Neighborhoods are also Hubs of Interaction, defined by Mixed-Use Neighborhoods, Recreation Places, Visible Activities, Public Domains, and Community Interface. Ecosystems are an important part of the overall campus environment, and this section contains standards for their maintenance and enhancement.

Buildings play integral roles in their neighborhoods, as described in Buildings and Their Details: Their main entrances, for example, will open onto and help define the Shared Open Space at ground level and offer smooth transition areas from outside to inside. Guidelines and standards are supplied for Human Scale, NC State Style, Exterior Elements, Transitions: Entrances and Lobbies, Transitions: Service Areas, Interiors, Interior Hearths, Learning Space, Research Space, Living Places, Administrative and Support Space, and Utility Infrastructure. Finally, the development of Campus Neighborhoods is based on Sustainable Design, and standards are presented for numerous neighborhood spaces and structures.

Shared Open Spaces
A large, well-defined outdoor area that gives physical definition to a Campus Neighborhood.

Character Places
Areas of special note that help define the identity of Campus Neighborhoods. They include Exterior Hearths, Landmarks, All Campus Paths, and Landscape Features.

Hubs of Interaction
A Campus Neighborhood site, large or small, that generates numerous interactions between and among people through a variety of activities.

Ecosystems
Areas of campus that include Forests, Woodlands, Wetlands, Streams, Lakes, and Ponds, Natural Upland, Urban Tree Canopy, and Urban Wildlife.

Buildings and Their Details

Sustainable Design
Guiding spaces that have lasting value and enhance the campus as it grows.
While each Campus Neighborhood is unique, all of the neighborhoods share several characteristics that must be considered in new construction or renovation projects.

Shared Open Spaces

Campus Neighborhood buildings are clustered to define five distinct types of Shared Open Spaces: Campus Greens, Courtyards and Plazas, Campus Streets, Campus Edges, and Natural Areas each defined below. These are the central areas of neighborhoods and are either nurtured or created by all development projects. Building location and orientation is critical to defining the boundaries of these spaces. These people-focused areas are the building blocks of campus, creating identity and providing places for collaboration while addressing appropriate use, scale and character. Vehicular traffic is minimized, and service needs are handled outside of the open spaces.

SITE STANDARDS FOR ALL SHARED OPEN SPACES

Shared Open Space Provides:

- **Connection** to each major building entrance in the Campus Neighborhood within a two-minute walking distance (six hundred feet).
- **Sight lines** or a clear sense of direction to the next nearest Campus Neighborhood.
- **A prominent visual and physical connection** to an All Campus Path.
- **A major focal point or amenity** that draws people from outside the neighborhood, such as an outdoor dining area, a fountain, a prominent vista, an amphitheater, or other comfortable, inviting gathering place.
- Opportunities for the creation of Landmarks including public art, which may assist in wayfinding and strengthen campus identity.
- Opportunities for the display of university community projects, research, etc.
- Opportunities for a variety of outdoor experiences, including educational and recreational experiences through the use of plants, landscape elements, materials, and other characteristics of the space.

**Landscape elements, hardscapes and site architecture that define space and contribute to the character of the open space.**

- A rich variety of seating types and locations, in sun and in shade, that encourage interaction, such as, fixed and movable furniture, hanging benches and seatwalls.
- **Plants to celebrate** building entrances, reinforce pathways, define exterior space, and ameliorate climate extremes.
- Opportunities for edible landscapes for people, and food and cover for urban wildlife.
- Accommodations for long-term success of shade trees, both deciduous and evergreen.

A rich palette of plants to offer seasonal interest and increase biodiversity.

Landscaaped edges forming the transition areas where buildings meet the ground especially at entrances.

Access to sun, wind, water, and earth adding multi-seasonal appeal and enhancing human comfort and safety.

Winter and summer Heathers where possible.

One or more connections to transit.

**Bike racks.**

Adequate service vehicle parking adjacent to but outside of the open space.
ARCHITECTURAL STANDARDS FOR ALL SHARED OPEN SPACES

Shared Open Space
Buildings create or enhance Shared Open Space.

Stand-alone buildings and buildings that establish new neighborhoods have at least one open space, creating the framework for future neighborhood development.

Buildings and their features frame views and/or allow connections to the Shared Open Space, paths, or other neighborhoods.

Building design should give particular consideration to the views created by the relationships among buildings and Shared Open Spaces.

Human-Scaled features and materials serve as transitions between the Shared Open Space and the architecture. Examples include canopies, arbors, portals, walls, lighting, planters, and furniture.

The central areas of neighborhoods are either nurtured or created by all development projects.

Campus Greens

Campus Greens are the largest type of Shared Open Space and are dominated by expanses of lawn. Major walkways run along the perimeters, connecting the building entrances that open to them. Neighborhood Paths cross the open space where needed. The perimeters feature trees and other plantings and a variety of seating and gathering places. There are currently two Campus Greens at NC State: the Court of North Carolina on North Campus and The Oval on Centennial Campus. A third Campus Green is under development at Greek Village.

SITE STANDARDS

Campus Greens:

- Are enclosed on at least three sides by buildings.
- Are one hundred thousand square feet or larger, with the narrowest dimension not less than one hundred fifty feet.
- Have a center expanse of lawn that is open, with minimal areas of shade.
- Have the long view unobstructed from one end of the space to the other.
- Have edges that are paved with paths and planted with trees to provide micro-climates favorable for seating and to reinforce entrances into the open space.
- Provide amenities, such as seating, pavilions and other small gathering places located at the edges.
Plazas

Plazas are large gathering spaces primarily composed of paving. Their ample paved surfaces are suitable to support the large outdoor functions on campus, from impromptu celebrations to programmed events.

SITE STANDARDS

Plazas:

- Are usually enclosed on three sides by buildings.
- Are twenty-five thousand square feet or larger, with the narrowest dimension not less than one hundred twenty feet.
- Have most of their paved surfaces unobstructed, allowing for flexibility for programmed events.
- May use trees to soften the space and add shade in summer.
- Provide seating opportunities for individuals and small groups.
- Include a range of options for micro-climate spaces, providing comfort in sun and shade throughout the year; plant choices respond to the range of micro-climate spaces.
- Have a focal point such as public art, a fountain, or other landmark that provides a distinct meeting place.

ARCHITECTURAL STANDARDS

Plazas

Building entrances opening into Plazas are placed to animate the Shared Open Space and to promote interdisciplinary collaboration.

Courtyards

Courtyards are well-articulated, outdoor spaces with either a landscaped or paved center that includes walkways, seating, and other amenities, such as a fountain, sculpture, or other landmark. Courtyards may be of a variety of shapes but must be large enough to define a neighborhood rather than be dwarfed by adjacent buildings. Ideally, it is possible to see at least one other Shared Open Space from any Courtyard and possible to reach it by a variety of paths.

SITE STANDARDS

Courtyards:

- Are usually enclosed on three sides by buildings.
- May be open or have a tree canopy at the center, depending on the character and intended activities of the neighborhood.
- Provide open areas to allow for programmed activities. Size is related to anticipated uses and takes Human Scale into consideration to promote interaction.
- Provide seating and gathering places that range in size to accommodate individuals and groups. Plants are used to soften the space.
- Include carefully-located benches and low seat walls to allow people using them to observe activity in the open space.
Include a range of options for micro-climate spaces, providing comfort in sun and shade throughout the year; plant choices respond to the range of micro-climate spaces.

Have a focal point such as public art, a fountain, or other landmark that provides a distinct meeting place.

ARCHITECTURAL STANDARDS

Courtyards

Building entrances opening into Courtyards are placed to animate the Shared Open Space and to promote interdisciplinary collaboration.

Campus Streets

While the word street typically connotes the primacy of the automobile, Campus Streets are Shared Open Spaces for people. They are the organizing element for the neighborhood. As interior streets, they support a high volume of pedestrian movement and limited, low-speed vehicular traffic. Examples are Stinson Drive and Gates Avenue. The main building entrances front these streets and open directly onto sidewalks, which can provide a variety of seating opportunities. Pedestrians can see the activities inside buildings through transparent windows and doors. The building setbacks may vary to provide gathering areas with various amenities. Service and vendor vehicles are directed to dedicated parking spaces in service courts off of Campus Streets.

SITE STANDARDS

Campus Streets:

Have pedestrian-dominant features: speed tables, pedestrian crossings, and narrow vehicle travel width.

Are lined with shade trees.

Have wide sidewalks to accommodate large numbers of pedestrians.

ARCHITECTURAL STANDARDS

Campus Streets

Buildings along Campus Streets are sited to define the walls of this Shared Open Space. The buildings along Stinson Drive provide one example.

Buildings entrances and outdoor activity spaces relate to each other across the street. Building entrances are easily recognizable and may project into the sidewalk area.

The space between the building and the street must accommodate pedestrian movement, plantings, seating and possibly bicycle racks. It may include a setback for a small court scaled to be consistent with the street and buildings. The spaces created by the design of Mann Hall and Burlington Laboratories along Stinson Drive provide examples.

Public interior spaces are adjacent to the street and visible from the exterior.

While the word street typically connotes the primacy of the automobile, Campus Streets are Shared Open Spaces for people.
Campus Edges
Campus edges are the public face of the university. For many, their primary impressions of NC State are created by these edges. Campus edges provide an appropriate reflection of the character and beauty of the campus. They are unifying elements that clearly and consistently demonstrate the campus identity.

SITE STANDARDS
Campus Edges:
- Present significant open views into campus with a minimum of visual clutter.
- Have architectural features or structures that clearly represent campus character (e.g., Gateways, brick walkways, columns and markers, accent lighting, signage, and other wayfinding elements).
- Screen parking lots from public view.
- Are pedestrian friendly.
- Have clearly marked pedestrian crosswalks that enhance safety and comfort.
- Are connected to adjacent neighborhoods with paths, gathering spaces, framed views, and campus streets.
- Use public art that provides an urban campus feel.

Are defined by a maintained landscape treatment.
Incorporate landscape elements that represent the campus character and clearly delineate the campus edge, such as planting trees and shrubs in a recognizable pattern or rhythm.
Have areas of groundcover or lawn in front of buildings.
Use plantings and other landscape features to decrease the impact of traffic.
Have signs that are unified, consistent, scaled appropriately, and limited in number. Sign messages are minimal and aimed to the first-time visitor.
Have underground utilities.
Have traffic signals on unified poles and mastheads.
Natural Areas
Natural Areas present unique opportunities for neighborhood facilities to interface with and incorporate access to less-developed green space that is more natural in character than the structured campus open spaces. These areas, such as North Creek or the Rocky Branch corridor, offer quiet alternatives to the developed campus open spaces, and afford opportunities to explore campus ecosystems as living laboratories.

SITE STANDARDS
Natural Areas
Natural Areas are linked to campus neighborhoods by the pedestrian path network.

Human-Scaled transitions from the built environment to the natural environment are achieved through paths, plantings, or other Landscape Features.

Natural Areas Incorporate spaces that allow people to enjoy and interact with nature.

Natural Areas receive a minimal level of maintenance so that they remain in their natural state.

ARCHITECTURAL STANDARDS
Natural Areas
Building faces adjacent to Natural Areas meet natural grade. No large fills or cuts are made adjacent to natural areas.

Building designs respect the character of the Natural Area. Natural Areas influence building and street designs.

Buildings allow views of and access to the Natural Area from interior public spaces.

Natural Areas can serve as the Shared Open Space of a Campus Neighborhood.
Character Places
There are places on campus that hold particular meaning for the university community, either because they are the sites of ceremonial or historical significance or because over time they have been recognized as having a quality that sets them apart from other areas on campus as worthy of special treatment and respect. These places are Exterior Hearths (e.g., University Plaza, The Oval, Court of North Carolina); Landmarks (e.g., “State College” smokestack; Hallowed Places (e.g., Court of North Carolina, Holladay Hall, Memorial Bell Tower); and Landscape Features (e.g., Lake Raleigh, Rocky Branch). The university will preserve and enhance these places, which give the campus a memorable sense of character.

Exterior Hearths
From benches beneath a tree to large Shared Open Spaces, these are the university’s gathering places and social centers, often containing some level of food service. Each development project must plan, arrange, and preserve space so that Hearths exist in all Shared Open Spaces. Since Exterior Hearths are gathering places, they are ideal locations for exterior art as a focal point.

SITE STANDARDS
Exterior Hearths:
Hearths are visible from and related to at least one other, and are connected by the All Campus Path.

Should connect to Interior Hearths.

Have a focal point, Landmark, or other feature unique to the neighborhood.

Hearths may include seating, covered areas, and electrical receptacles.

Landmarks
Landmarks are distinctive and dominant in the landscape and aid in wayfinding. They may be a feature of a building, a free standing object, a Hearth, a Natural Area, or public art that over time or through design has become part of the university’s identity. They are sometimes associated with a memorial structure or ceremonial functions.

SITE STANDARDS
Landmarks:
Are protected and enhanced by each development project.

Are located so that views to them are attractive, act as points of reference along All Campus Paths and facilitate campus wayfinding.

Are connected to or are part of Shared Open Spaces.

May incorporate elements of learning into their design.

Landmarks have great symbolic and unifying power. They are distinctive and dominant in the landscape and aid in wayfinding...
Hallowed Places

There are campus places that, over time, inspire a feeling or mental image that is uniquely “NC State.” They are irreplaceable campus buildings, landscapes, and natural settings to which people have created lasting bonds throughout generations by providing an “underlying commonality of experience which evokes awe, fascination and inspiration” 11.

These buildings, unique places, and natural resources are cataloged, restored if necessary, nurtured, and celebrated to reflect pride in the university’s heritage and respect for the past. Projects that impact these areas require comprehensive review by stakeholders representing the campus community to ensure their unique character is preserved, restored, or enhanced.

Hallowed Places:
The Court of North Carolina
Free Expression Tunnel
Holladay Hall
Lake Raleigh Woods
Mary Yarbrough Courtyard
Memorial Belltower
Pastures east of the College of Veterinary Medicine
Reynolds Coliseum
University Plaza (“The Brickyard”)
Landscape Features
Landscape Features are landforms, woodlands, meadows, gardens, green open spaces, and ecosystems that provide each Campus Neighborhood with unique character. They are respected as amenities and are enhanced.

SITE STANDARDS
Landscape Features:
Are accessible to Neighborhoods and their Shared Open Spaces.

Include plantings that provide food and habitat for wildlife and people.

Are repaired or enhanced by the use of native plant materials that conserve the area’s unique character.

Are available as an educational resource to an extent that does not compromise their natural character.

Are identified on campus maps, where appropriate, to assist in wayfinding.

Hubs of Interaction
The focus of study and work in each neighborhood generates unique activities, and these activities help define the neighborhood’s personality. All facilities - housing, teaching, student services, research, etc. - have the need for interior and exterior spaces that not only support their own related activities, but also make them accessible to the university community. This Physical Master Plan encourages development that creates interactions which foster appreciation of human and educational diversity and promote understanding and collaboration across disciplines. Hubs of Interaction are identified as part of each development proposal for a neighborhood.

Mixed-Use Neighborhoods
Neighborhoods are well defined physically by the arrangement of buildings around a Shared Open Space, but the life and personality of a neighborhood are generated by the activities within the buildings and outdoor spaces. When these activities engage a diverse group of campus community members, they enhance the university’s mission. Mixed-Use Neighborhoods, which offer a variety of academic, social, and other activities, engage the greatest number of people. Important features of any neighborhood, therefore, are facilities such as libraries, galleries, or food services that draw people who do not routinely work, teach, or study there. Renovations are used as an opportunity to develop public activity spaces that attract a wide spectrum of people from across the campus.

SITE STANDARDS
Mixed-Use Neighborhoods
Develop neighborhood open spaces to accommodate a variety of activities, such as outdoor dining, outdoor classrooms, informal non-scheduled play areas, and/or summing “beaches.”

Develop sufficient hardscape in each neighborhood to accommodate a variety of uses for outdoor gatherings and for those requiring temporary tents, tables, and chairs.

ARCHITECTURAL STANDARDS
Mixed-Use Neighborhoods
When developing project scopes, identify and address deficiencies in neighborhood uses.

Provide spaces that allow a variety of academic, social, and other activities to draw people into the neighborhood.

Ground floors of buildings are designed to be flexible to accommodate a variety of uses over time.
Recreation Places
Recreation places range from formal game areas such as Miller Fields to smaller, informal Campus Green spaces such as Tucker/Owen “Beach.” These places support and encourage spontaneous play and interaction. They are appropriately located near Exterior Hearths and are easily reached along the Campus Path system.

SITE STANDARDS
Recreation places:
Accommodate a diversity of activities in a variety of weather conditions and times of day.
Have accessible entries and viewing opportunities.
Provide places for audiences to view the activity.
Have carefully sited utilities and utility access points to maximize the useful area of the space.

Visible Activities
Making activities of campus life visible creates a sense of place, reveals neighborhood character, increases safety, and aids in wayfinding to all who pass by. Buildings are designed so that indoor public spaces are revealed from within and from the outdoors. The Shared Open Space is visible from the neighborhood entries so people see activities and are encouraged to enter and engage.

ARCHITECTURAL STANDARDS
Visible Activities
Provide views to interior public and teaching activities.
Exterior paths and Hearths are set back from the windows of classroom and other teaching spaces to minimize distractions to the students inside.
Within the building, provide views into classrooms, labs, lounges, lobbies, and administrative reception areas.

Public Domains
Buildings and Shared Open Spaces have public-to-private zones. Public zones in buildings include entries, circulation cores, vending areas, and conference spaces. Exterior public zones include outdoor dining and seating areas, Hearths and porches. Interior and exterior public spaces are developed in close proximity so that their activities animate each other and provide settings for stimulation and communication.

SITE STANDARDS
Public Domains
Activities in the Public Domains of a neighborhood connect to the Campus Path system.

ARCHITECTURAL STANDARDS
Public Domains
Interior and exterior public spaces are designed to interact and animate each other.

Community Interface
University improvements and growth require that the university embrace community planning in neighborhoods adjacent to the campus, so that campus facilities strengthen the surrounding communities. Campus-edge facilities reach out to and enhance city neighborhood development.

SITE STANDARDS
Community Interface
Where the campus interfaces with the city community, entrances will have views that invite pedestrians into campus open spaces.

ARCHITECTURAL STANDARDS
Community Interface
The design of buildings will enhance and complement the character of the surrounding communities.
Ecosystems

Forests, meadows, wetlands, streams, lakes, and ponds are important to the university’s and the state’s heritage, as are the natural topography, urban tree canopy, and urban wildlife. All of these features add diversity to the landscape and enrich campus neighborhoods. Ecosystems provide teaching opportunities and learning experiences and contribute greatly to a sense of community and belonging and thus aid the university in its educational, research, and service missions. The university will actively preserve and/or enhance natural wildlife corridors and specified Ecosystems. The university will be a model of sustainable environmental stewardship for the state, following its commitment set forth in the Guiding Principles. It will develop the campus in a way that sustains the natural environment for both the university community and its neighbors by following and exceeding state and local environmental standards.

**ECOSYSTEM STANDARDS**

**Meadows**

Meadows have value on campus for aesthetic, ecosystem, educational, water efficiency and fuel reduction benefits. Meadows are a temporary landscape feature in the natural succession process, in which the land eventually becomes wooded. Meadows require only minimal mowing.

*Maintain graded future building sites as meadows.*

*Design and create meadows for cleared areas that are not planned for academic or recreational programming.*

*Native grasses and wildflowers are encouraged to grow in these areas, through naturalization and/or seeding.*

*A mowed edge at the visible border is maintained.*

**Forests**

*Wooded areas add value to our campus by providing shade, aesthetics, wildlife habitat, air and water quality, as well as recreation and learning opportunities.*

*Preserve, enhance, and increase forest lands and tree cover.*

*Manage trees to provide aesthetic and climate benefits, including planting, trimming, removing, and replacing trees.*

*Expand the diversity of native tree species to favor native wildlife, reduce non-native species, and eliminate invasive species.*

**Streams**

*Natural drainage ways should be open, rather than being buried and invisible. At the same time, the university protects downstream resources and neighboring properties from destructive runoff.*

*Pedestrian access and visibility to streams is increased.*

*Streets and paths are bridged over streams rather than the streams being diverted through culverts.*

*Stream corridors and buffers are protected and enhanced for wildlife habitat.*

*Tree canopies are maintained over creeks and streams.*

*Development within the watershed protects and enhances the vegetative stream buffer, water quality, and stream channel.*

*Stormwater controls are located near the source, the impact of stormwater runoff is minimized by conserving adequate stream-corridor buffer width.*

*Stormwater control methods are designed to manage flow to creeks and increase and improve the stream buffer zone.*

*When stream bank stabilization is required, vegetative and naturalizing bioengineering concepts are used in lieu of hard river control structures.*

*When redeveloping a site, existing stormwater conveyances and management measures at creeks, streams, and drainage ways are examined and repaired or renovated in a manner to improve the stream channel.*

*The university will actively preserve and/or enhance natural wildlife corridors and specified Ecosystems.*
**Stormwater**

Stormwater projects address runoff as close to the source as possible, upstream of potential erosion and flooding impacts. Exceeding minimum stormwater regulations is a goal for all development. Each new development project addresses stormwater as an integrated campus-wide system with management measures to:

- **Create conveyances** that are features in the landscape.
- **Be visible** for teaching and educational outreach.
- **Minimize negative impacts** on humans and the environment.
- **Keep flow** to predevelopment levels.
- **Manage stormwater** close to the source.
- **Utilize innovative, low maintenance methods** for keeping stormwater onsite, such as infiltration devices, vegetative practices, and detention and retention facilities.
- **Minimize contiguous impervious area**.
- **Replace impervious pavement** with pervious surfaces where possible, especially in areas prone to flooding.
- **Maximize infiltration** of stormwater into the soil.
- **Prevent pollution** of surface waters.
- **Control nutrient levels** leaving the site.
- **Prevent erosion** due to land disturbance.
- **Manage erosion** through the use of appropriate ground cover materials.

**Vegetation**

The choice of vegetation is important for maintaining aesthetics, research opportunities, wildlife habitat, and human food.

- **Provide examples of uncommon indigenous vegetative types** as a teaching tool and an environmental resource.

- **Use predominantly native plant materials** in natural and naturalized areas, greenway corridors and along creeks, streams, and drainage ways.
- **Maintain street-tree canopies** to provide a continuous habitat for birds and other urban wildlife and to provide shade for pedestrians.
- **Include appropriate native plant materials** to provide food and cover for urban wildlife.
- **Exotic plants may be used in the landscape for diversity, human food, teaching and research purposes**, but invasive species of exotic and native plants are not to be used.

**Topography**

The campus’s natural topography is one of the greatest defining characteristics of NC State. The ridges, valleys and other natural land forms are the inspiration for the arrangement of neighborhoods, respecting the lay of the land.

- **Buildings, streets and other infrastructure** respond to and enhance natural land forms.
- **Plan for correct solar orientation of buildings** to minimize heat gain.
- **Maintain open views** from hilltops and high promontories.
Buildings and Their Details
NC State’s buildings are a source of pride for the campus community and the citizens of North Carolina. Each building plays an important role in its Campus Neighborhood and is designed to enhance the university with enduring and timeless qualities. Materials and construction methods shall not be compromised in favor of programmatic demands. Each building is Human-Scaled and designed in context with nearby structures, the campus fabric, and the natural surroundings. For example, the tower on Tower Hall serves as a visual counterpoint to Hunt Library and is a Landmark on The Oval that aids in wayfinding. Tower Hall also incorporates a Portal that is a threshold between The Oval and the more intimate Courtyards within the residential neighborhood. On a finer scale, the building includes detailing such as the metal screen that accentuates the tower, brick patterning and texture, and subdivision of the fenestration that gives Human Scale to a large structure.

While each Campus Neighborhood is unique, all of the neighborhoods share several characteristics that must be considered in new construction or renovation projects.

ARCHITECTURAL STANDARDS GENERAL
Buildings and their details
The coherence and unity of the campus takes precedence over individual building design. Buildings that have a prominent location or a special role within a neighborhood are reserved for public functions, e.g., libraries, large auditoriums, college or departmental offices, or other similar spaces. Buildings that serve a particularly public function and have a high visibility role will enjoy greater latitude in terms of the compositional massing.

Memorable building elements are encouraged particularly in an otherwise uniform streetscape to assist in wayfinding, e.g., prominent entries, contrasting features.

Architectural design acknowledges the building’s programmatic role.

Human Scale
Campus Neighborhoods of Human-Scaled buildings and Open Spaces are NC State’s primary planning unit for development. Campus buildings are arranged to define Shared Open Spaces that accommodate diverse activities. For example, a building with large mass is subdivided into smaller units and has more detail at the ground plane. This is done with repeated fenestration patterns, arcades, building set-backs, porches, overhangs, and other features that make the building scale match peoples’ range of perception. Distances across Shared Open Spaces should allow one person to recognize another’s face or hear his or her voice.

ARCHITECTURAL STANDARDS
Human Scale
Limit building height to four stories above grade. Under some circumstances such as in laboratory buildings or in designated zones along the edge of major vehicular routes, buildings may be taller. In these buildings, the visual impact may be decreased by using setbacks at the third or fourth floor and including features such as arcades at the ground floor. Additional height will not be allowed if it is detrimental to the overall neighborhood.

Building massing is achieved through grouping relatively simple building blocks such as a rectangle or square in plan to easily define edges of outdoor space. This is especially important in urban conditions when the role of the building is to define the street edge. These basic building blocks may be combined in various ways to enclose a Shared Open Space.

When programmatic requirements result in a building that is overly large for its neighborhood, divide the building into a complex of smaller, connected buildings.

Buildings and parking decks are sited and detailed to respect Human Scale.

Include building elements in a range of sizes from those seen from a distance down to hand size (brick/mullion) to give the buildings sufficient detail.

Detail the ground level with features and elements that create pleasant outdoor spaces at the street, the entry, or other pedestrian areas.

Repetition of shapes and patterns, surface materials, and building elements at various scales unify the building while providing rhythm and variation. These elements are compatible with others in the neighborhood.
NC State Style

The NC State Style is eclectic and reflects the university’s diverse programs in agriculture, industry, and technology. The style has a lasting sense of quality characterized by common elements that unify the campus and contribute to its heritage. Buildings reflect the time in which they were built as well as the disciplines they have housed, adding further diversity to the campus’s built environment. The university’s industrial heritage can be seen in such buildings as Riddick, Pege, Tompkins, and Nelson Halls. The university’s emphasis on supporting advancements in learning and technology is reflected in more recent projects, such as SAS Hall on North Campus and Hunt Library on Centennial Campus.

ARCHITECTURAL STANDARDS

NC State Style

NC State buildings have a tripartite organization: base, middle, and top.

Projects draw design cues (scale, massing, rhythm, details) from surrounding architecture in the neighborhood.

Additions to existing buildings respond to and complement the existing structure to create a whole composition that is harmonious between its existing and new parts.

Additions avoid overwhelming or drawing attention away from the existing structure.

BASE

Buildings relate to the landscape and respect the contour of the site. The base of the building is connected to the earth at natural grade, avoiding graded building pads. Respectful siting provides visual variety and opportunities to develop gathering spaces and to shape the Shared Open Space.

The university encourages the construction of arcades and other covered areas at building bases to protect exterior pedestrian environments.

There are openings in the massing at the base where there is pedestrian access or activity.

Entries are readily visible and identifiable.

MIDDLE

The midsection contains the predominant material of the building (red brick, for example) and is a continuous surface, broken only with individual window or door openings, which may be organized into groups.

The university encourages large expanses of openings to reveal the activity within the building.

Window groupings and occasional bay windows create external rhythm on the facade.

TOP

The building top has sufficient detail to give the building presence and is in harmony with its surroundings.

This zone of the building may contain window strategies and materials different from those used in the base and middle sections.

Parapets are preferred over rooftop guardrails as they provide safety and conceal rooftop equipment. Guardrails must be integrated into the building’s architecture.

Mechanical equipment penthouses and fume hood exhausts are integrated into the design of the building top.
Exterior Elements
Architectural elements increase in delicacy, variety, and structural complexity and decrease in scale at pedestrian areas, building entrances, and Shared Open Spaces. These elements are related to the function and character of the activities the building contains, while the building’s materials and scale provide continuity with other buildings in the neighborhood.

ARCHITECTURAL STANDARDS
Materials
NC State uses a consistent palette of exterior materials throughout the campus for a sense of continuity that clearly and consistently demonstrates the campus identity.

The structure of the building and the purpose of the materials will be expressed and seen in the architecture of the building.

Building materials are authentic—they are functional and purposeful and do not imitate other materials.

Design elements and architectural features are sympathetic to the neighborhood context.

Elements of an existing building inform the detailing of an addition.

Human-Scaled materials are used.

Materials are chosen for their enduring, low-maintenance qualities.

Masonry
Flashed, red, wire cut, modular brick is preferred and is the predominant exterior material for all buildings. Brick and mortar color unify new construction with that of the existing buildings and neighborhood.

For additions, brick size and color blend closely with that of the existing building.

Stone, cast stone, and precast concrete are subordinate to the brick. They may be used for such purposes as trim, sills, lintels, building bases, entrance elements, medallions, and steps.

Limestone is the university’s stone of choice. Cast stone or precast concrete, when used, resemble limestone in color and texture. Other stones are considered in limited areas or as part of a significant building. Polished exterior stone is discouraged.

Metal
Metal is subordinate to brick. It may be used for visual applications such as roofing, window mullions, bay windows, metal panels and/or screens, trim, and railings.

For additions, the entire composition of the new and existing building elements is considered when determining the appropriate amount of metal.

Metal panels, screens, trellises, brise-soleils, railings, and similar elements should be light in color or blend with the building materials.

Glazing
Glazing shall be clear or lightly tinted so as not to impair vision lines.

Spandrel or clerestory windows may include a wider range of glass types. Reflective coatings are limited to larger scaled buildings that front high-speed corridors. Ceramic frit screen shall not be considered for vision glass.

Windows
Windows typically are singular openings in a continuous wall surface. Windows may be grouped together to give emphasis to an area or to establish a rhythm.

Consider the fenestration pattern precedent of surrounding buildings when determining window proportions and rhythm.

Fenestration pattern shall allow for future flexibility of interior space configuration.

Windows typically are subdivided to add detail and scale to a building.

Openings are recessed three inches or more to give depth to the wall plane.

Windows are operable in occupied spaces.
Large open expanses of glass are appropriate for buildings that serve a highly public role or have special activity areas within that are made visible from the outside.

Bay windows are allowed when they are appropriate for the neighborhood but do not dominate the primary wall plane.

Window mullions should generally be light in color.

Walls
Walls are articulated to create a rhythm of frames, pilasters, or recesses with depth between wall and window planes on the continuous surface.

The university encourages detailing of masonry walls (arches, lintels, soldier courses, decorative patterns, etc.) to visually reinforce the nature of the material.

Steps
A building entry requiring a grade change has steps as a means of entry that are integrated with the accessible entry.

Steps are proportioned generously enough to provide seating and still allow unimpeded passage.

Arcades
Arcades are ideally located on the south side of buildings.

They are located along the face of the building that has an entrance.

They are most appropriate along primarily pedestrian paths, especially where they open to major outdoor spaces.

Buildings are visually open to the arcade for safety and interest, and the arcade is well-lit.

Roofops
The university encourages the use of sloped roofs.

Sloped roofing should be neutral in color, or blend with neighborhood context.

Communications towers, when located on rooftops, must add to the feeling of NC State as a technological center and not detract from neighborhood Design Harmony.

Rooftop equipment and penetrations are organized and/or screened to allow proper performance and access while improving the roof’s appearance.

Roof design should facilitate inclusion of sustainable practices.

Color
Color evokes emotional and physical responses; its use brings added dimension to the experience of being on campus. The use of color on buildings and in the landscape can aid in wayfinding and animate a Campus Neighborhood. Color can be used to celebrate a building entrance, highlight an important activity space in the landscape, identify a neighborhood Hearth, or accentuate architectural detailing.

Since architectural trends and neighborhoods change as the campus develops, color must be used in ways that can be easily and inexpensively modified. Surfaced that require routine finish maintenance, e.g., painted surfaces, interior walls, furnishings, and floor coverings, are ideal surfaces on which to introduce color. Surfaces of long-lasting, durable materials; e.g., floor or wall tile, laminates, toilet partitions, must employ timeless or neutral color selections.

NC State’s colors are red and white. Red will be used in the campus environment only when specifically associated with university branding or wayfinding signage. For clarity of wayfinding, the use of red is restricted in the environment and on building exteriors. The use of red and white as a predominant interior color scheme is limited to athletic or physical education facilities. For additions, material colors and textures blend with those of the existing building.
Transitions: Entrances and Lobbies

Building entrances are transitional zones between the inside and the outside, and lobbies are a prominent feature of these zones. Every building has at least one prominent entrance that fronts a Shared Open Space. Distinctive paving is used at these locations. Every entrance is accessible, providing an unencumbered transition in the best spirit of Universal Design.

Major entrances have a protective cover, significant architectural features, and adjacent landscaped areas. The lobby allows views into the adjacent spaces to communicate the building’s functions. The names of buildings are clearly marked at major entrances, and effective signage for wayfinding is clearly visible just inside. Secondary entrances to buildings also have overhead canopies, adjacent landscaped areas, and seating walls or benches. These entrances have smaller foyers visible from the outside.

SITE STANDARDS

Entrances and Lobbies

The arrival sequence into building entrances is reinforced and enhanced with plant and landscape material.

Entrances along the All Campus Paths assist in wayfinding by creating memorable points of reference.

Complex, ornamental plantings are placed at high-use areas such as building entrances to maximize their benefit.

Plant material over three feet in height at maturity must be planted and maintained in such a way that it does not hinder safety and security by creating visual barriers and/or shadows at entrances.

Foundation plantings are planned and arranged so that maintenance personnel can easily walk between the building face and the mature plants.

ARCHITECTURAL STANDARDS

Entrances and lobbies

Buildings that serve as a gateway to a Campus Neighborhood have a visible entrance from outside as well as from inside the neighborhood.

Buildings that face inward to a Hearth also maintain a public face on campus edges.

The material used at a building entrance may include stone and/or glass.

Ramps, when used, are integrated into the building arrival sequence and are given precedence over stepped entrance ways.

Major and secondary entrances provide adequate overhead cover extending beyond the building envelope to provide ample sheltered space for gathering and waiting outside of the building. Recessed entrances are daylighted or employ other means to convey an open, welcoming appearance.

Entries progressively increase in detail and wall depth as one approaches, employing special features such as archways, canopies, unique light fixtures, etc.

Outdoor seating is incorporated at entries.

Bike racks are located near entries yet do not interfere with pedestrian flow or detract from the appearance of the building.

Every entrance is accessible, providing an unencumbered transition in the best spirit of Universal Design.
**Interiors**

Interior design continues the established pattern of exterior architectural detailing. The design of shared interior space accentuates the activities it contains. This detailing guides people along a hierarchy of corridors from large public spaces to smaller, private spaces while making offices and programmatic areas approachable. Major interior corridors readily accommodate pedestrian traffic and create lively connections to outdoor paths. The activities in public spaces such as office suites, computer labs, and Interior Hearths are visible and accessible from major corridors. Buildings are safe, secure, university accessible, well-lighted, have readily identifiable entrances, and have clear wayfinding signage.

**ARCHITECTURAL STANDARDS**

**Interiors**

*Future flexibility in building use is an important design consideration; no building shall be so unique that it cannot be easily renovated. Building plans shall incorporate modular principles that allow for future programmatic changes.*

*Long corridors and with views to interior or exterior spaces and have features that add interest along their length.*

*Transition spaces are incorporated between public and private zones.*

*Interior spaces are illuminated by the transmission of natural light through the use of interior glazing, skylights, light shelves.*

**Interior Hearths**

All buildings need Interior Hearths. Some of these are spaces that have symbolic meaning and are protected and enhanced during renovations. All Hearths are important gathering centers, such as Caldwell Lounge and the Fox Reading Room. These multipurpose community spaces allow for informal interaction, study, learning or larger scheduled functions. They are inviting places offering opportunities for meetings of varying sizes. Interior Hearths are prime locations for the placement of art. The university encourages the establishment of a network of Interior Hearths at the ground plane. Hearths may include: food service, retail, galleries, large assembly areas, information centers, and lounges.

**ARCHITECTURAL STANDARDS**

**Interior Hearths**

*Hearths are located near the main entrance. They are adjacent to and visible from main circulation paths and provide some feeling of intimacy.*

*Hearths organize interior wayfinding.*

*Hearths provide a variety of comfortable seating including tables or tablet-arm chairs that support personal electronic devices. Power outlets adjacent to seating and Wi-Fi transmitters are incorporated into the design.*

*Hearths may provide opportunities to write, express ideas and share information.*

*The university encourages incorporation of stair landings and other functional areas as part of a Hearth.*

*Where possible, the Interior and Exterior Hearths are connected.*

**Learning Space**

Academic buildings support a variety of teaching pedagogies and learning styles and offer appropriately scaled learning spaces. These rooms inspire and facilitate learning. They are designed to accommodate multiple uses without sacrificing architectural detail or adaptability to future needs. Classrooms are equipped to facilitate the use of technology in learning. Teaching and learning occur in places other than classrooms; possibilities for these activities are reinforced in the interior and exterior built environment.

**ARCHITECTURAL STANDARDS**

**Learning Spaces**

*The university’s classroom standards are followed for classroom and learning space design.*

*Learning spaces are grouped together and are located on the lower floors.*

*Faculty offices are also learning spaces and are easily found through the hierarchy of corridors.*
Classrooms shall have proportions that are more square than rectangular, long narrow spaces make for poor classrooms.

Learning spaces are configured with flexibility in mind to allow for future changes in size and teaching pedagogies.

Using principles of Universal Design, learning space configuration shall allow for and encourage interaction among students.

Learning spaces are located within the building to allow for indirect natural light. Classrooms have windows and include light control to allow for visual projection and similar technologies.

The design of classrooms permits their use lighted only with natural daylight.

Interior windows in learning spaces may be translucent to reduce student distraction.

Research Space
Research spaces are frequently sites for partnership interactions and collaborations. They allow the student population to engage with researchers in the discovery and creation of new knowledge. These spaces must be suitable to the specific research purpose yet be flexible enough to meet ever-changing research needs.

ARCHITECTURAL STANDARDS
Research Space
Some research spaces need to be secure and isolated for safety reasons, but all shall have access to Interior Hearths, lobbies, conference areas, entrances, and other community spaces, and visibility to major circulation corridors.

Research spaces are designed in modules and share support spaces to allow programs to easily expand or contract.

Research spaces have natural daylight and visibility to the outside.

All research spaces must include type-specific lab safety features to provide a safe environment for the campus community.

Living Places
The residential experience influences how well students learn and develop. Living and learning villages support student programs and services, and comprise residence halls and other facilities that enhance students’ educational experience and performance. Each village is unique and offers “a variety of opportunities for students to engage in active and collaborative learning with peers, faculty, and staff.”

The design of residence halls and their Shared Open Spaces support both indoor and outdoor activities. Interior and Exterior Hearths are strategically located within each living and learning village, creating a vibrant campus neighborhood.

SITE STANDARDS
Living Places:
- Are organized around a Shared Open Space.
- Are directly accessed from an All Campus Path.
- Are located along Wolfline routes.
- Provide a variety of shaded and sunny outdoor spaces, and a variety of seating types.
- May have designated outdoor spaces for specific activities or sports.
- Share site amenities that support gatherings.
- Incorporate hardy, low-maintenance edibles in the landscape design.
- Have exterior power outlets at seating areas.
- Provide numerous locations for and types of bicycle storage.
- Provide locations for recycling and waste disposal

ARCHITECTURAL STANDARDS

Living spaces
Residence hall design and detailing imparts a residential character and reflects the living and learning environment.

Residence halls include a variety of informal, intimately-scaled and larger group meeting spaces.

Residence halls may include study and exercise spaces, and laundry facilities.

The hierarchy of corridors and architectural detailing clearly defines public and private spaces.

The design maximizes opportunities for natural light and views in units, gathering spaces and corridors.

Sound transmission between units, and mechanical system components, is minimized.

Materials are durable and easy to maintain.

Administrative and Support Space
Administrative and support spaces have access to Interior and Exterior Hearths, and visibility to the outside and to major corridors. Customer service areas are easy to find, welcoming and sized appropriately to accommodate the flow of pedestrian traffic generated by these offices. Conference rooms, multipurpose rooms, training rooms, and customer service areas are ideally shared to maximize their use and to minimize duplicating spaces and the costs associated with extra construction. These spaces must be adaptable to future uses.

SITE STANDARDS

Administrative and support space
Administrative buildings are sited around a Shared Open Space and are grouped to provide easy to find services.

At support buildings, service yards are designed so that unsightly views are screened from paths, streets, and adjacent buildings and neighborhoods.

ARCHITECTURAL STANDARDS

Administrative and support space
The architecture and detailing of administrative and support buildings is consistent with the NC State style.

Conference rooms are located on main circulation corridors, rather than being embedded within an office suite, to encourage use by more than one user group and for ease in wayfinding.

In open offices there is easy access to adjacent private areas for phone calls, meetings, lactation and other uses.

Private offices are centered in the office suite to allow open office workstations access to natural light and views to outside.
Service Areas
All facades contain public entrances, and most campus buildings do not have a “back” or “rear.” To create a safe and inviting entry sequence for pedestrians, service yards, equipment yards, loading docks and utilities are designed to minimize pedestrian/vehicular conflict, and to minimize visual intrusion of utilitarian functions into the surroundings. Future campus development must consider the potential vantage points from buildings and open spaces in the design and placement of these areas. Consider grouping service areas to serve multiple buildings. Service drives and yards provide adequate areas for shade tree plantings which reduce the visual impact of their utilitarian nature, and reduce heat sink effects.

SERVICE AREAS HAVE:
Adequate space for all anticipated outdoor building support, utility equipment, trash and recycling containers.
Additional space for installation of future equipment to support research needs.
Architectural screening that is integrated into the overall building design or neighborhood context.
Entries and corridors sized to accommodate the movement of goods and services.
Paved paths from the custodial exit to dumpsters.
Equipment that is dark architectural bronze in color.
Bollards as required to protect the building or other features.
Parking spaces for vendor, delivery, standard and small-sized service vehicles, and electric service vehicles with recharge stations.

Utility Infrastructure
Consistent with the commitment to resource conservation, energy efficiency, and sustainable development, the utility systems are developed as centralized district systems. In general, the utilities on campus are owned, managed, permitted and maintained by the university. The utility systems are designed for firm capacity at the utility plants and redundant distribution systems to maximize reliability. Where appropriate, the university aligns utilities within limits of Multipurpose Paths.

The pedestrian nature of campus often results in buildings having no obvious service side. Service yards, loading docks, dumpsters and freestanding equipment are screened from pedestrian view and planned for with pedestrian safety in mind. The presence of exterior equipment is minimized to enhance open spaces while at the same time the equipment remains easily accessible. Locating utilities underground and equipment in screened service yards has aesthetic and reliability benefits.

ARCHITECTURAL STANDARDS
Utilities infrastructure
Utilize Multipurpose Paths for utility corridors to minimize conflict with vehicular traffic, street trees and natural areas. The architecture and detailing of central utility plants is consistent with the NC State Style.
Locate mechanical rooms at the perimeter of the building and at grade for direct connectivity to utilities.
Design and locate equipment to minimize visibility, noise, and vibrations, especially near teaching, lab, study, residential, and public areas.
Co-locate equipment in service yards, underground, or in concealed places. Service yards shall have easy access to mechanical rooms.
All exterior equipment, service yards, roof penetrations, mechanical penthouses, etc. are integrated into the building’s design.
Equipment is dark architectural bronze in color, and is concealed by landscaping or screen walls less than eight feet in height.

13 Firm Capacity: the amount of energy available for production or transmission which can be (and in many cases must be) guaranteed to be available at a given time.
Sustainable Design
The university’s commitment to sustainability and efficient, responsible development takes many forms. It includes creating a campus that is more inviting for walking than for driving, the renovation and reuse of existing structures, and the use of recycled materials in construction. Whenever feasible, the university places buildings on sites that are in need of repair and designs them in harmony with the natural contours and other features of the land. Proper building siting can have a significant impact on building performance and often results in little or no additional construction cost. Early in the design process, consideration of solar orientation, wind, and various climate and micro-climate factors, including vegetation, can reduce energy requirements, increase natural ventilation, and improve the quality of interior daylight. At this point in the process, building materials and systems selections are made to allow for sustainable choices to be incorporated into the project. The design and construction of every building allows for its efficient maintenance, creative adaptability, and renewability. To ensure that these and other important factors are integral to building design, a full life-cycle cost analysis is a part of the early design phases. Considerations to reduce negative externalities are included in the project plans and specifications. Examples include: specifying building materials within a 500-mile radius of the construction site to avoid excessive pollution caused by shipping methods and distances; managing stormwater to avoid damage to communities downstream; and reducing or eliminating facility consumption of fossil fuels, which pollute air.

SITE STANDARDS
Sustainable Design
A building’s long axis is oriented east/west and windows are oriented north/south whenever possible to take maximum advantage of natural light while limiting solar heat gain. Where the long axis cannot be oriented east/west, configure portions of the building’s footprint to achieve the same goals.

Buildings located on the south side of a Shared Open Space are designed so that the shadow they cast in the open space is minimized.

Building footprints are minimized with multi-story construction to ensure each site has space for outdoor common areas and Hearths.

Hearths are provided on the south-facing side of each building to accommodate informal gathering places.

Use of green roof technology is encouraged to lessen the impact of stormwater effects and reduce the intensity of heat islands.

MATERIALS
Sustainable Design
The design lifespan of all buildings, new and renovated, is a minimum of fifty years.

Life-cycle environmental impact, durability, and long-term maintenance and operating costs are considered when choosing materials.

Renovation and reuse of existing structures extend the life of existing buildings and reduce consumption of materials.

Select materials that are harvested and manufactured locally, have recycled content, or are from rapidly renewable or certified sustainable resources.

RECYCLING AND REUSE
Sustainable Design
Planning for the reduction and recycling of construction waste is included in early design phases and in the contract documents. Use of manufacturer recycling programs should be utilized to reduce material in waste stream.

Projects must follow NC State University Construction Waste Management Plan which specifies a minimum landfill diversion rate of 50% and encourages reuse and recycling of building materials.

Every building has adequate accommodations for the recycling of common materials (paper, glass, aluminum, etc.) easily accessible to individuals and to service providers.
INDOOR AIR QUALITY AND ENVIRONMENT

Sustainable Design

To ensure healthy indoor air quality, use materials with reduced air contaminant emissions. Design a separate outside exhaust system where chemical use and storage or other air contaminants occur within buildings.

Provide occupant control of thermal, ventilation, and lighting systems to support optimum health, productivity, and comfort.

Plan for carbon dioxide and humidity monitoring equipment.

Ensure that building occupants are not exposed to environmental tobacco smoke.

Locate air intakes far away from loading docks and other sources of poor-quality air.

Locate noisy exterior activities and mechanical equipment to minimize the impact on building occupants, particularly in critical task areas such as classrooms and research and study areas.

Improve the indoor environment for productive work and study by providing daylighting, acoustics attenuation, and views to outside.

Placement of exterior and interior glass is aligned to bring natural light further into the building. Light shelves, reflective or white ceiling systems, and light colored interior finishes should all be considered to maximize the effectiveness of the daylighting strategy.

Plan for the placement of mats at exterior doors to minimize dirt and pollution in buildings.

ENERGY

Sustainable Design

The university strives to exceed the North Carolina State Energy Code for both new and renovated buildings.

Innovative water saving, energy saving and energy generating technologies will be factored into project scopes; solar energy, green roof, and gray water-use features will be considered.

The optimum level of energy efficiency for the building and systems will be established by the schematic design phase.

Control heat loss and gain through building envelope design, which includes insulation and glazing/shading choices, and by limiting heat loads from lighting and equipment.

Energy use will be reduced with controls and sensors that minimize consumption when buildings are not in use.

Electricity, steam, chilled water, natural gas, and domestic water usage are metered for each building to create an energy consumption database.

Commissioning and retro-commissioning are budgeted for each major facility to optimize building systems equipment and minimize energy waste.

Employ renewable energy sources and energy-saving building technologies to allow for downsizing of heating and cooling systems.

To reduce ozone depletion, existing mechanical equipment that uses CFC-based refrigerants will be replaced.

WATER

Sustainable Design

A water management plan is developed with each project design.

Water-conserving fixtures and equipment are used to minimize potable water demand and to decrease wastewater generation. Include the collection and reuse of nonpotable water where feasible.

Domestic water is metered at each facility and a post-occupancy evaluation measures peak water use data for future planning.

To minimize irrigation needs, the university prefers the use of indigenous plants and plants tested for adaptability to the region.
Design Guidelines and Standards:

**Campus Paths**

If Campus Paths are a special feature of the NC State path system. It is actually a system of interconnected paths sharing distinctive features that create a special zone for pedestrian movement, with amenities such as seating, landscaping, and special paving. All Campus Paths and their surroundings showcase the beauty and uniquely engaging qualities of the NC State campus as well as being special places and destinations in themselves.

Integration of these paths will be achieved over time with further enhancements to pedestrian movement, the highest ideal for people movement within the campus. These enhancements make paths safe and aesthetically pleasing, provide walking comfort, and move people in an expeditious manner to their destinations. To support pedestrian friendly Neighborhood Streets, the number of single occupancy vehicles will be reduced in the more densely developed areas through a strategy of providing large parking facilities at campus perimeters.

Memorable neighborhoods and paths are the primary means of wayfinding, which makes the campus easy to navigate, understandable and recognizable. Wayfinding is derived from paths that provide a clear indication to the next neighborhood, unique Landmarks at significant intersections, and clear expressions of primary building entrances. All improvements to campus contribute to successful wayfinding.

Wayfinding is assisted by exterior signage, not dependent upon it. All exterior wayfinding signage on university-owned land is uniform and attractive, promotes the university’s graphic identity, and enhances the professional appearance of the campus while aiding in navigation. For details, refer to the “NC State University Exterior Signage Manual.”

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**Pedestrian Paths**
- Include All Campus Paths, Neighborhood Paths, Connector Paths, Multiuse Paths, Bikeways, and Stairways and Portals.

**Vehicular Paths**
- Include Thoroughfares, Collector Streets, Neighborhood Streets, Vehicular Gateways and Entrances.

**Transit Paths**
- Include standards for Bus Priority Corridor and Fixed Guideway Transit.

**Parking**
- Includes standards for Parking Docks, Collector Lots, Parking Areas, and On-Street Parking.

Wayfinding is derived from paths that provide a clear indication to the next neighborhood, unique Landmarks at significant intersections, and clear expressions of primary building entrances.
Pedestrian Paths
This section describes the campus path network designed for people-powered movement. All campus destinations shall be accessible to all people, using the principles of Universal Design. The larger paths are scaled to accommodate a volume of traffic including bikes, people-powered vehicles, and occasional service vehicles. Paths consist of common elements defined by the NC State Construction Guidelines such as paving details, lighting, benches, plantings, and site amenities. Path intersections create opportunities for Landmarks, Hearths and special features that enhance wayfinding. Campus Paths provide a sense of connection among the university’s engaging and beautiful places.

Each capital project or campus improvement shall provide an accessible pedestrian connection to the campus path network so that people may move freely and safely throughout.

The larger paths are scaled to accommodate a volume of traffic including bikes, people-powered vehicles, and occasional service vehicles.

Standards for All Pedestrian Paths

THE ROLE OF PEDESTRIAN PATHS
Pedestrian Paths accommodate bicycles and other people-powered vehicles. They are designed to provide access to service, emergency, and other special-function vehicles.

Exterior Hearths are often located at major Pedestrian Path intersections.

Path intersections with streets, parking lots, or other contact points that have vehicular traffic are clearly marked.

Each project connects to the path network extending beyond a project’s immediate limits to make appropriate linkages.

MATERIALS
The dominant material for Pedestrian Paths in the North Campus and Central Campus Precincts is red-flashed brick pavers in context with surrounding color and pattern.

Pedestrian Paths in the West, South, and Centennial Precincts may incorporate other materials in addition to brick.

To enrich design and celebrate special places, materials other than brick and patterns other than running bond may be used as trim or accent to indicate the direction of pedestrian flow, to mark entrances to spaces and buildings, to identify bike lanes on the path, and to identify bus stop areas.

Concrete walls are designed with a sub-base and reinforcement for service-vehicle access and with regular patterned control joints for aesthetics and ease of demolition and maintenance.

All pedestrian paths will have sufficient lighting. All Campus Paths shall have an enhanced level of lighting. Security stanchions will be considered on a case-by-case basis. Specifications for these safety features are found in the NC State Construction Guidelines.

PATTERNS
The standard pattern for all brick paths is running bond, aligned with the direction of pedestrian traffic flow.

Different patterns may be introduced at “people places,” such as All Campus Paths, Courtyards, Plazas, and major pedestrian entrances to the campus.

Non-red brick colors may be added for a more complex pattern in Plazas and at building entrances.

Patterns and colors incorporate principles of Universal Design.

In areas where concrete plazas are suitable, incorporate brick as trim or dividers.

Paver pattern at buildings and entrances
Hunt Library
BUILDING ENTRANCES
Paths have a more ornate pattern than running bond to celebrate entrances.
Paths expand in width for pooling of pedestrians.
Paths accommodate seating, recycling and trash receptacles, special lighting, landscaping features, bike racks, and ashtrays (at a distance in accordance with campus policy).
Paths are sized according to the numbers of building occupants and their activities.
Paths have architectural cover next to buildings.
Paths run through covered walkways along building walls.

STEPS ON PATHS
Steps serve as a secondary method of entering buildings and outdoor spaces.
When co-located with an accessible route, begin and end steps in close proximity to the accessible, primary route.
Steps are wide enough to allow for both pedestrian seating and pedestrian flow.
Steps are used only on steep slopes.
Exterior steps are less steep than interior steps.
Steps have open rails for visibility.
Steps on paths have bike troughs.

Campus Paths provide a sense of connection among the university’s engaging and beautiful places.
PLANT MATERIALS
Paths have large deciduous trees to provide summer shade and to allow sun to filter through in winter.
Large trees enhance a sense of direction along Campus Paths.
Shrub plantings along all walks are low and spaced to not obstruct visibility.
Plant material lends Human Scale and form to paths.
Use color variation in landscaping to make a path memorable and to aid in wayfinding.

All Campus Paths
All Campus Paths are the campus’s most intensely used and lively type of pedestrian path. The width of All Campus Paths is sufficient to create an active promenade with pedestrian amenities for those passing through, as well as comfortable seating along the edges for people-watching. They may be wider in some areas to create settings for small gatherings. These paths incorporate the principles of Universal Design and accommodate bicycles, skateboards and other forms of human-powered movement. Vehicular access is strictly limited to service, emergency, and special events vehicles.

All Campus Paths serve as the scenic and functional routes from which key campus locales can be viewed and also provide opportunities for impromptu social interactions. Consisting of a network of pathways located in the urban areas of campus and interfacing with streets, they form an interlocking web with common characteristics and serve as a unique and distinctive design feature of the university.

All Campus Paths connect shared open spaces and provide access to Campus Neighborhoods. Many building entrances, outdoor dining areas, retail establishments, student lounges, libraries, food service destinations, and housing facilities are found along All Campus Paths. The Campus Paths and Shared Open Spaces plan identifies the vision for expanding and upgrading the network.

SITE STANDARDS
All Campus Paths
All Campus Paths have a minimum width of fifteen feet.
All Campus Paths are the recommended travel route after dark and provide enhanced lighting and other security features.
Directional signage and pedestrian kiosks are incorporated along All Campus Paths to assist with wayfinding and information.
All Campus Paths offer opportunities to highlight the academic activities in the neighborhood.
Every Campus Neighborhood Hearth has access to an All Campus Path.
Each neighborhood provides a memorable feature or Landmark to assist in wayfinding along the All Campus Path.
Development projects along future All Campus Path routes incrementally contribute to their implementation and enhancement.

Seating is placed in key areas along All Campus Paths to provide opportunities to observe and participate in neighborhood activities.

All Campus Paths may incorporate special embellishments to standard running bond pattern in a way that is unique to that neighborhood. Special paving may be used, especially in areas where the path enlarges to create hearths or gathering places or intersects with other paths.

Where an All Campus Path leads from one neighborhood to another, the pathway is clearly defined by the directness of the route, width of the path, standard paving pattern, and other landscape features and landmarks.

Views from All Campus Paths are created or enhanced to aid in wayfinding from one neighborhood to the next.

Connector Paths
Connector Paths generally run parallel with a street and are designed to move high volumes of pedestrian traffic in a direct and safe manner to their destinations. They connect destinations such as large parking areas, campus precincts, and neighborhoods directly to each other. Connector Paths also connect to other path systems to reach specific destinations, and to the City of Raleigh’s pedestrian network. These paths are wide enough to accommodate pedestrians, occasional bikes, and other people-powered modes of transportation. In locations where bike traffic volume is high, bikeways will be designated.

SITE STANDARDS
Connector Paths:
Projects impacting streets will incorporate a Connector Path parallel to the street, providing access to bus stops.

Pavement material may be brick or concrete with a minimum width of 10 feet.

When a Connector Path runs parallel to a Campus Street, curbing and a six-foot planting buffer area will separate the path from the street.

When a Connector Path intersects with a Neighborhood Street, pedestrians have the right of way over vehicular traffic. These paths have a raised pedestrian table or other traffic calming devices for crossing these interior streets.

Connector Paths are designed to move high volumes of pedestrian traffic in a direct and safe manner to their destinations.

16 A bike-only lane that allows bikes to move at high speeds without conflict with pedestrians or automobiles.
**Neighborhood Paths**

Neighborhood Paths move lower volumes of pedestrians than Connector Paths and are within Campus Neighborhoods. They connect building entrances, open spaces, small parking lots, and other destinations within and adjacent to the Campus Neighborhoods. They are wide enough to accommodate an occasional bike or service vehicle. They may also be secondary connectors or incidental paths that provide convenient local pedestrian connections within Campus Neighborhoods and across campus Hearths.

**SITE STANDARDS**

**Neighborhood Paths**

*Pavement material may be brick or concrete* with a minimum width of 8 feet.

*Where Neighborhood Paths cross* interior campus streets at mid-block or at intersections, crosswalks are delineated by paint, stamped concrete, or other contrasting material.

**Multipurpose Paths**

Multipurpose Paths are accessible walks along natural corridors connecting various areas throughout campus, designed for recreation or enjoyment of the natural environment. They connect to the City of Raleigh Greenway system where convenient. These paths are designed as an alternative route for pedestrians and people-powered vehicles to move throughout campus with few road crossings. To reduce conflicts with vehicular traffic, underpasses are provided at street crossings. Path spurs may access stream banks or other natural amenities for study or recreation. Multipurpose Paths connect to the larger community and bring people to and through campus. They may have markings to indicate bike and pedestrian lanes.

**SITE STANDARDS**

**Multipurpose Paths**

*Multipurpose Paths and their spurs are accessible to all people, and are designed for bike and pedestrian safety*

*Paving material is asphalt* with reinforced sub-base.

*Paving minimum width* is 10 feet with 2-foot, reinforced gravel shoulders.

*These paths accommodate* occasional maintenance vehicles.
Gateways and Portals

Gateways indicate arrival at major campus entries and serve as transitions between the campus and surrounding community. They are easily recognized, clearly communicate the university brand, and are marked with appropriately scaled archways, monuments, railings, walls, other architectural elements, signage, large canopy trees and ornamental plantings.

Portals serve to define entrances into or between Campus Neighborhoods. They are easily recognized as passageways and are defined by an appropriately scaled overhead form created by an architectural feature or plantings. Transit Steps are located near portals when feasible.

ARCHITECTURAL STANDARDS

Gateways and Portals
Campus Gateways share unifying elements that clearly and consistently demonstrate the campus identity and reflect the context in which they are placed.

Portals are Human Scaled passageways defined by plantings or architectural features.

SITE STANDARDS

Paths at Gateways:
Provide open access and views in multiple directions.

Feature appropriately scaled wayfinding signage.

Are designed in context with the surrounding community and campus.

Provide clear links to major campus paths.

Are wide enough to serve as pedestrian drop-off areas.

Feature red and/or white-flowering landscape materials.

Are defined with a vertical statement.

Paths at Portals:
Are wide enough to accommodate the change of direction in pedestrian flow.

May feature a unique pattern in the pavers.

Are defined with an overhead form.

May be enhanced with flowering landscape plantings.

Are accessible for all pedestrians and small maintenance vehicles.
Vehicular Paths

Vehicular paths support the concept of a pedestrian-oriented campus with a sustainable, safe, convenient, and attractive transportation network. Reduction in the campus's reliance on the single-occupancy vehicle is a primary goal. Vehicular parking is managed to support this vision.

Personal car movement may be restricted within the cores of campus precincts and on some interior campus streets. Vehicular operations in these areas will be limited to transit, service, emergency vehicles and those vehicles needing a special right of entry to accessible parking and loading areas. Passenger car movement and large parking areas will be near the campus’s Thoroughfares and Collector Streets found at campus perimeters.

A range of vehicular travel choices that are accessible, convenient, safe and easily understood make this vision possible. As the population of the campus community increases in the South and Centennial Precincts, an underpass at Avent Ferry Road and Western Boulevard that accommodates pedestrians and bicyclists will provide a safer and quicker connection between precincts.

STANDARDS FOR ALL VEHICULAR PATHS

All Vehicular Paths have:
- Accessible parallel sidewalks, pedestrian amenities, lighting, wayfinding signage, and may provide access to security stationhaus.
- Large street trees located 40 feet minimum, 65 feet maximum on-center.
- Intersections with curb-cuts in each crossing direction that meet Americans with Disabilities Act Accessibility Guidelines and that meet NC State standard detailing.
- Bicycle facilities and/or pavement markings, promoting safe bicycle movement.
- Sidewalks as described in the Pedestrian Paths section.
- Sidewalks that are widened at path intersections to provide room for pedestrian “pooling.”
- Block-style pedestrian crosswalk markings.
- Raised pedestrian tables; usually at mid-block crossings that accommodate large numbers of pedestrians.
- Pedestrian underpasses adjacent to the waterways that they span.

Thoroughfares

Thoroughfares are major public roads that bring people to campus in personal vehicles and other various modes of transit. Avent Ferry Road, Centennial Parkway, Hillsborough Street, Blue Ridge Road, and Western Boulevard are considered Thoroughfares. Thoroughfare traffic moves at 35 miles per hour or greater.

Where Thoroughfares form campus and precinct edges, they are made Human Scale, beautiful, and safe. Landscaping, lighting, and signage provide a comfortable environment for both the driver and for pedestrians moving parallel or crossing these streets. Large parking areas are located near Thoroughfares to capture commuter traffic before it enters smaller campus streets. Special pedestrian amenities, including tunnels, provide for the safe crossing of Thoroughfares.

SITE STANDARDS

Thoroughfares have:
- Posted speeds of 35 miles per hour or greater.
- Parallel, accessible Multipurpose Paths for people-powered movement separated from the travel lanes.
- A planting strip between the travel lane or curb and pedestrian paths for safety.
- Signage directing drivers to major public campus destinations in accordance with NC State's exterior signage standards.
- Pedestrian crossings with pedestrian-activated signals at intersections.
- Pedestrian refuge areas if there is a median or excessive distance crossing travel lanes at pedestrian crossings.

Collector Streets

Streets that connect precincts and distant Campus Neighborhoods are Collector Streets. Examples are portions of Gorman Street, Sullivan Drive, Method Road, Varsity Drive, Dan Allen Drive, Pullen Road, and Main Campus Drive. Collector Streets are often used by personal vehicles that must move around more densely populated pedestrian areas. Collectors generally have traffic speeds that do not exceed 25 miles per hour and share the road with scooters and bicycles moving in the travel lane.

Collector Streets have parallel pedestrian paths such as All Campus Paths or Connector Paths and are ideal for locating campus bus stops and transit service. They have a balance of pedestrians and vehicles moving safely.
SITE STANDARDS

Collectors have:
- Posted speeds of 25 miles per hour or less.
- Sidewalks behind and adjacent to the curb and/or a planting buffer between the curb and Pedestrian Path.
- On-street parking where needed and appropriate.
- Bus stops at convenient locations, especially where an All Campus Path or Connector Path crosses the street.

Mid-block pedestrian crossings where appropriate.
Raised pedestrian tables where an All Campus Path or Connector Path crosses the street.
Pedestrian wayfinding signage.
Space for bicycle transit along the street, guided by sharrows markers on the pavement.

Neighborhood Streets

Neighborhood Streets are located in densely developed areas, are narrow and are designed to discourage personal vehicular traffic. Examples are Stoner Drive, Cates Avenue, Dunn Avenue, and Oval Drive. Neighborhood Streets are used primarily by transit vehicles, service vehicles, bicycles, other human-powered vehicles, and cars used by short-term and weekend visitors. A limited number of Neighborhood Lots may be found off Neighborhood Streets.

Along Neighborhood Streets, buildings are close to the road, entrances face the street and there is a high concentration of pedestrians using the wide sidewalks that parallel and cross these streets. Speed limits are 15 miles per hour or lower, and traffic-calming strategies are used to keep vehicle speeds low.

SITE STANDARDS

Neighborhood Streets
- Streets are narrow to keep speeds low and discourage through traffic.
- Posted speed is 15 miles per hour or less.
- Bicycles are encouraged to operate in the travel lanes by use of sharrows markings on the streets.
- High-volume Pedestrian Paths crossing the street may have raised pedestrian tables or other traffic-calming devices to give pedestrians the right of way.
- On-street parking may be found on these streets.
- Paving materials similar to those used on Pedestrian Paths may be incorporated into the street to designate high-volume pedestrian crossings.
- Street tree plantings respond to building entrances and pedestrian ways and therefore may be less formal.

Bikeways

Bikeways may be designated bike lanes in the roadway or multipurpose paths shared with pedestrians that allow bikers to move at various speeds with minimal conflict with pedestrians or automobiles. Portions may be elevated or underground. This type of bicycle facility will make traveling between campus precincts more efficient, therefore encouraging people to use bicycles to travel. A bikeway between North and Centennial Campus is needed and requires additional supporting studies to determine the exact location and design criteria.

Bicycles racks, shelters, and lockers are placed throughout campus in locations convenient to All Campus Paths and buildings. Small bicycle parking areas will be located near entrances of buildings for convenient short-term parking. Sheltered bicycle parking will be incorporated into the building or surrounding landscaping where possible. Stand-alone covered bicycle shelters will also be implemented where possible. Bicycle lockers will be available for longer-term storage at Parking Decks, Transit Center Stations, and in areas that are not served by a Bicycle Station.

ARCHITECTURAL STANDARDS

Bikeways
- Bike racks are located on paved surfaces such that the bikes do not encroach on pedestrian circulation, and are under cover where possible.
- Bike shelters are covered parking structures with their “interiors” highly visible from the exterior. Security standpipes may be located at or near each shelter.
- Bike lockers are enclosed, lockable storage units, located on paved surfaces. Given their utilitarian appearance, they shall be located or screened so they do not detract from building entrances or Hearths.

16 A “sharrows road arrow” that is placed directly on pavement and intended to denote a safety zone where cyclists can ride on the street.
17 Traffic calming: the combination of mainly physical measures i.e., speed humps, islands, chicane points, medians, traffic circles, small corner radii, streetscape, etc. that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users. From the Institute of Traffic Engineers Journal.
To provide increased safety and security, bike racks are best grouped together and sited within view of building lobbies and streets.

**Bicycle Stations**
Bicycle stations provide enhanced bike amenities at high-volume bicycle destinations on campus and at commuter hubs. They are covered and provide racks, lockers, air pumps and may include bicycle repair equipment.

**ARCHITECTURAL STANDARDS**

**Bicycle Stations**
Bicycle Stations are located in dense Campus Neighborhoods near primary destinations and at Bus Transit Stations and at perimeter parking decks.

Campus maps and bus schedules are posted.

Their location is within view of building lobbies or streets. The “interior” is highly visible from the exterior. Security stanchions may be located at or near each station.

**SITE STANDARDS**

Bicycle Stations

Plantings and other Landscape Features are placed to keep sight lines open.

Hardscape surrounding the shelter is ample, wide enough to accommodate several bicyclists arriving or leaving simultaneously.

Stations are designed to minimize energy use for lighting. Timed lighting is incorporated for night hours of operation.

Bike racks, bike lockers, and other features are available for theft protection.

Air pumps are available.

Showers and storage for bicycle commuters may be incorporated into larger stations.

**Vehicular Gateways**

Like the Gateway enhancements that welcome pedestrians, Vehicular Gateways serve as the transition between the campus and the surrounding community and clearly indicate arrival to NC State. Vehicular Gateways accommodate pedestrian and people-powered movement as well as cars and other vehicles. Therefore, in addition to the vehicular paths they frame, they incorporate other paths as appropriate into their design.

Vehicular Gateways serve as the transition between the campus and the surrounding community and clearly indicate arrival to NC State.
Transit Paths
Bus transit at NC State provides reliable, quick and easy transit for the NC State community to move about campus. The bus system is planned to grow into a coordinated multimodal (bus, fixed guide way and rail) transit system. Transit uses campus and city streets and its own rights-of-way to cross and connect the precincts of NC State’s campus. The routes and stops of all transit modes enhance the Campus Neighborhoods and their features and the Pedestrian Paths.

Bus Transit
The university bus system, known as the Wolfline, is free and is complemented by local and regional services that link cities throughout the Triangle. Wolfline routes use a variety of campus and city streets to connect all campus precincts, nearby residential neighborhoods and activity centers. The Stops for the Wolfline route network enhance Campus Neighborhoods, their features and the Pedestrian Paths. Continued reliance on a rubber-tired transit technology to serve the majority of transit needs is envisioned for the foreseeable future.

Priority Corridors
To meet future travel demand between campus precincts, maximize rider capacity and ensure Wolfline schedule reliability, Priority Corridors may be designated on selected university and public roadways. Special treatments favoring bus movement could include bus lanes outside of general traffic, intersection signal prioritization, exclusive bus ways that allow buses to move unhindered to achieve greater timetable reliability and avoid general traffic access limitations. Founders Drive and Dan Allen Drive already illustrate some of these features. As Centennial Campus develops and intra-campus bus travel grows along with traffic congestion, other Priority Corridor opportunities will be considered, including Varsity Drive through Greek Village, and the planned Pullen Road extension to connect North and Centennial Campus Precincts.

Stations
Stations are buildings that accommodate multiple routes (both city and regional) and normally include multiple bus bays, covered passenger seating, real-time arrival/departure information, restrooms and other amenities such as retail or food service. At present, there are no Stations. However, the 2012-2022 Campus Mobility Plan identified the need to study the ridership demand to determine whether a Station near Hunt Library and Town Center is needed. This Station could also connect Wolfline routes to the future Fixed Guideway Transit.

Transfer Hubs
Transfer Hubs accommodate multiple routes and act as focal points of activity. They include capacity to queue multiple buses and provide shelters for passenger waiting and seating. Currently three Transfer Hubs offer frequent and convenient bus route changes: D.H. Hill Library on Founders Drive where multiple Wolfline routes converge and where local and regional connections can be made on Hillsborough Street, Carmichael Gym on Morrill Drive, and on Main Campus Drive at the College of Textiles. In addition, two minor hubs can be found along Partners Way at both Hunt Library and Engineering Building I. Most of the existing bus routes utilize these hubs, allowing for passengers to transfer easily from one route to another.

Should planned commuter rail or light rail systems construct stations on campus, new rail-bus Transfer Hubs will need to be located and designed to create pedestrian-friendly station access. It is anticipated that at least one new Transfer Hub will be located near the intersection of Dan Allen Drive and Yarbrough Drive to serve those planned commuter rail and light rail stations.

Stops
Transit Stops are designed and located to serve passenger demand and to facilitate safe passenger loading and unloading. At certain locations, bus layovers are desirable to allow buses to get back on schedule. Strategically placed bus layovers increase the overall reliability of individual routes and the bus system as a whole.
ARCHITECTURAL STANDARDS

Stops
In general, shelters shall be uniform to present a consistent identity.

SITE STANDARDS

Stops
Transit Stops are safe and accessible and are configured and sited so waiting space does not impede pedestrian flow.

Fixed Guideway Transit
NC State is reserving a corridor for a future Fixed Guideway Transit mode. While the technology for such a mass transit system is not yet determined, this mode is envisioned to carry substantial numbers of people to and from high-volume destinations and across campus precincts. The design of this system shall enhance the character of campus buildings and landscapes, and allow for the safe crossing of pedestrian and vehicular paths along its route. Its design shall not create a barrier to pedestrians and other vehicular circulation. Fixed Guide Way Stations will be connected to large parking areas, the Pedestrian Paths network, and Bus Stations, Transfer Hubs and Stops.

ARCHITECTURAL STANDARDS

Fixed Guide Way Stations
Fixed Guide Way Stations will be accessible and connected to the Campus Paths network.

Stations will provide safe and comfortable pedestrian amenities.

Transit Stops provide site amenities such as comfortable benches, trashcans, route maps, wayfinding signage, and appropriate lighting.

Transit Stops have clearly identifiable Wolfline signage with route number and route name.

Bus Layovers are located away from buildings’ fresh-air intakes and Exterior Hearths to reduce infiltration of fumes and noise. Seating is sited away from the source of exhaust fumes.

Parking

Parking areas form transition places between the vehicular and the pedestrian domains and have clearly defined Pedestrian Paths within them. Along these paths the university creates places for communication or simply for waiting and resting comfortably. All lots must be lighted sufficiently for safety. Large parking areas are located to provide easy connections with regional, local, and campus transit and the pedestrian path system.

Parking areas are the final destination along the vehicular paths for commuters and visitors to campus. As such, major parking areas will be located on the campus perimeter, proximate to Thoroughfares and Collector Streets, with pedestrian connections to Transit Stops and campus destinations. Major parking facilities are designed in concert with Transfer Hubs and bike stations to facilitate a smooth and efficient mode shift from the single-occupant vehicle to walking, transit, and bicycling to campus destinations.

Every renovation and new development project will have parking requirements addressed in each scope statement to meet university and local requirements for parking.

STANDARDS FOR ALL PARKING AREAS

All Vehicular Parking Areas:
Are designed in accordance with the City of Raleigh Landscape Ordinance.

Have adequate sidewalks making safe, accessible connections to the campus’ Pedestrian Path network, transit stops, and campus destination points.

Have vehicular and pedestrian wayfinding signage.

Use planting areas as infiltration basins to detain or retain surface runoff.

Use special landscaping and lighting to reinforce direction of vehicular and pedestrian flow.

Have shade tree canopy to minimize the effects of heat gain on the air and water, and to reduce the energy needed for cooling vehicles.
Parking Decks
Personal vehicles are directed into Parking Decks and Collector Lots at campus perimeters to minimize the impact of traffic through the campus and surrounding city neighborhoods. Parking Decks are pedestrian-friendly, incorporating architecture and landscape elements to refine building mass. The architecture and site details shall address security issues, which are of the utmost importance in the design of Parking Decks. Parking Decks may also include other uses such as retail and housing on the street facades to give the building a Human Scale.

SITE STANDARDS
Parking Decks
Site parking decks along campus perimeters to reduce the numbers of personal vehicles entering Neighborhood Streets.
Locate decks to encourage pedestrian movement through neighborhoods.
Locate decks to allow round-the-clock use where spaces are shared with the city and neighboring businesses.

ARCHITECTURAL STANDARDS
Parking Decks
Architectural details are incorporated to relate the deck to neighborhood buildings.
Where parking decks are integral to a Campus Neighborhood or are adjacent to a neighborhood’s Shared Open Space, the face of the deck is lined with occupied building space with doors and paths fronting the neighborhood.
Decks are subdivided to enhance wayfinding and to break up building mass.
Decks shall have a primary entrance for pedestrians and open stairwells, providing adequate visibility and lighting.
Daylight is directed into deck interiors.
Green roofs, living walls, and other sustainable features are incorporated. Shading exposed parking levels with solar panels and other passive energy installations may be explored.
Covered Stoops, wayfinding maps, lighting, bicycle parking/storage lockers, and recycling are some of the amenities incorporated at pedestrian entry/exit points.
Bus layovers with bus driver restroom facilities are incorporated into deck design as needed.
Collector Lots
These parking areas are to be built to a Human Scale, with the same attention to detail, wayfinding, and accessibility as Campus Neighborhoods and Paths. The university will use setbacks, buffers, landscaping and architectural scale, and other elements of design to avoid building monolithic barriers to vision and movement. These parking areas will be located and designed so as not to degrade nearby off-campus neighborhoods.

SITE STANDARDS
Collector Lots:
- Are subdivided by tree canopy planting strips and planting islands, and provide formalized Pedestrian Paths that connect to the Campus Path hierarchy.
- Are designed to mitigate negative environmental impacts, such as stormwater concentrated by impervious surfaces, pollutants carried by runoff, heat, noise, and glare.
- May have planting islands designed to utilize storm water for irrigation and to remove pollutants.
- Have bus stops with shelter and bicycle racks.

Neighborhood Lots
Neighborhood Lots are small and are located off Neighborhood Streets. They are reserved mostly for service and limited departmental parking, accessible parking, visitor parking, and short-term loading. While ensuring a sense of safety within these lots, the university uses landscaping, low walls, berms, and so forth to screen the visual impact of the lots from adjacent campus spaces.

SITE STANDARDS
Neighborhood Lots:
- Neighborhood Lots contain a maximum of fifty cars.
- They may be combined into a collection of linked lots.
- Their space is defined by shade trees and other plantings.
- Use of permeable pavement is encouraged.

On-Street Parking
On-street parking serves as protection for the pedestrian and may be found on one or both sides of some Neighborhood or Collector Streets as street widths allow. On-street parking brings people to the street and provides safe and convenient spaces for short-term needs, accessible parking, and evening parking needs. It provides a zone for drop off, loading, and bus pullovers. On-street parking moderates vehicle speeds on roadways and promotes pedestrians’ sense of safety.

SITE STANDARDS
On-Street Parking Spaces:
- Are parallel to the sidewalk.
- May be interrupted at intervals by bump outs planted with street trees.
- Are often terminated by planted bump outs to screen parked cars from views on the pedestrian path.
The NC State Capital Improvement Plan weaves together academic and enrollment plans, space allocation plans, and master plan studies, and is guided by The Pathway to the Future: North Carolina State University Strategic Plan 2011–2020. Capital projects are established through the evaluation of space utilization, future academic and enrollment projections, space needs analyses, facility condition assessments, and university strategic initiatives.

While the goals of the university’s strategic plan reinforce NC State’s values, the physical master plan specifically responds to stewardship of the available space resources. Capital projects must strengthen interdisciplinary scholarship, research, and partnerships per the strategic plan; however, when enrollment continues to grow but capital funding is uncertain, more efficient utilization of existing space becomes increasingly critical.

Capital Improvement Plan

Process
The university undertakes a periodic collaborative review of the Academic Space Needs Analysis, Enrollment and Employment Projections, Space Standards, and Facility Condition and Quality information to inform the Five-Year Capital Improvement Plan and help establish the project list and priority order.

Sponsored Programs
NC State strives to achieve its strategic goals of increasing students’ civic and global knowledge, experience, and perspectives by creating opportunities and providing space for sponsored programs to thrive.

Partnerships
NC State is enhancing local and global engagement through strategic partnerships.

Enrollment and Employment Projections
Two major factors impact the demand for space: projected research and enrollment growth.

Space Needs Analysis
The Space Needs Analysis compares existing space, existing space standards, and projected space needs to evaluate space utilization and re-purpose space.

Space Standards
Space is categorized into Instruction & Study Space, Office & Research Laboratories, Special Use, Housing, and General Support & Health Care. Space Standards have been adopted for classroom, teaching laboratory, research laboratory, design studio, library study, and office spaces.

Space Efficiency and Space Utilization
The feasibility to re-purpose space is necessary to maximize efficiency and utilization, especially with the need to support research with limited space resources.

Facility Condition and Quality
The Facilities Condition Assessment Program identifies Improvements to upgrade obsolete building systems and to meet contemporary standards.
Process
Every three to four years, a collaborative academic space needs analysis is performed to update and assess the space inventory. Future enrollment, faculty, and staff projections are used to estimate the quantity of space, classified by type and discipline, needed to accommodate growth and strategic plan goals. The University of North Carolina’s General Administration (UNC-GA) space standards, which are based on national benchmarks, are used as the metric’s for classroom, class lab, office, and library space. NC State has unique research and studio space, therefore, the university has refined standards for those space types to suit specific disciplines. Existing space allocations are compared to these standards to determine the percentage of academic space needs met. To complement the quantitative analysis, an annual facility condition assessment program appraises the quality of campus buildings.

This quantitative and qualitative information feeds into the Capital Improvement Plan to help establish the project list and priority order. Potential building sites are evaluated and building programs evaluated to verify whether they are achievable based on anticipated capital funding. To comply with the Guiding Principles, such as creating Mixed-Use Neighborhoods, the development of a building program may spur the need for additional projects. For example, a new student housing development would need other student services in close proximity, such as dining, retail, and recreation, in addition to academic buildings, to provide a full complement of activities.

The Capital Improvement Plan is developed into a Six-Year Capital Project List on a biennial basis for appropriated, non-appropriated, and repair and renovation projects. Private investment projects are evaluated outside the purview of this process.
Sponsored Programs
NC State is a research-intensive university with historic strengths in agricultural, engineering, and scientific disciplines. As the number of research faculty grows, especially in targeted areas, the laboratory and specialized space needs for sponsored programs will grow accordingly. NC State strives to achieve its strategic goals of increasing students’ civic and global knowledge, experience, and perspectives by creating opportunities and providing space for these programs to thrive.

Partnerships
Partnerships across disciplines create synergies in education, training, technology transfer, research, and economic development through personal and professional interaction. NC State is enhancing local and global engagement through these strategic partnerships. Renovations and new construction to provide facilities that help attract high caliber faculty, staff, and students and encourage greater opportunities for everyone are part of the Capital Improvement Plan. The capital projects are shaped directly by specific program requirements and indirectly by neighborhood amenity requirements.

The Physical Master Plan provides dedicated land and a flexible framework to accommodate campus partners; from leased space in NC State buildings to land leases for entire buildings. Facilities are located close together, forming a research neighborhood, to facilitate interaction among partners. It is important that leased space is available for campus partners located proximate to university labs and specialty facilities to enhance partnerships and foster collaboration.

Enrollment and Employment Projections
Two major factors impact the demand for space differently from that in the past: research and undergraduate enrollment. Projections for the undergraduate population have historically driven enrollment and employment growth, but are now planned to remain relatively static, while graduate student projections will see a marked increase. The number of graduate students focusing on research and holding teaching assistantships is growing at a faster rate than in the past, therefore, additional research lab and office space are needed to accommodate this population increase.

NC State’s strategic goals to enhance interdisciplinary scholarship and research by investing in faculty will require increasing the number of tenured and tenure-track positions as well as their associated post-doctoral, professional, lab technician/clerical, and graduate student staff positions. This increase in number of positions will drive the demand for more research lab and office space.

NC State Faculty and Staff Head counts for Academic Units, 1996-2013 and Projection to 2020

Academic Units include:
- College of Agriculture & Life Sciences
- College of Design
- College of Education
- College of Engineering
- College of Natural Resources
- College of Humanities & Social Sciences
- College of Sciences
- College of Textiles
- College of Veterinary Medicine
- Poole College of Management
Space Needs Analysis
The Space Needs Analysis compares existing space, existing space standards, and projected space needs in order to identify space surpluses and deficits by type of space. Projected space needs are based on enrollment and, faculty and staff growth as determined by the Office of Institutional Research and Planning. To achieve the projected academic and enrollment growth by 2020, NC State must have adequate quantity and quality of space to fulfill the university’s strategic plan. Both of these factors are considered in the development of the Capital Improvement Plan project list.

Space Standards
The Space Standards for classrooms, teaching laboratories, research laboratories, offices, and library study facilities were adopted by UNC-GA. NC State revised the research laboratory standard to better align with the university’s wide variety of research space and developed a teaching laboratory standard specifically for College of Design studies. [http://www.ncsu.edu/facilities/con_guidelines/index.htm](http://www.ncsu.edu/facilities/con_guidelines/index.htm)

NC State’s 2012 existing space is illustrated in the graph below by space type, excluding university housing:

### General, Support & Health
- Care: 18%
- Instruction & Study: 20%
- Research: 15%
- Office: 17%
- Special Use: 30%
- General Use: 6%
- Support: 6%
- Health Care: 10%

* Housing not included

### Instruction & Study Space
Classrooms, teaching laboratories, and library study space directly support the academic mission of the university. Together these spaces comprise 20% of university space, excluding university housing. NC State strives to provide high-impact educational experiences for students as part of its strategic plan, therefore, maintaining and effectively utilizing instruction and study space is essential.

Classrooms are scheduled primarily for instruction and are not associated with a specific discipline. They include general-purpose classrooms, lecture halls, recitation rooms, and seminar rooms. Reduction in the number of section offerings per course has increased the demand for larger size classrooms. NC State periodically reviews the space needs for classrooms by Neighborhood and section size for current and projected enrollment.

Teaching laboratories are used primarily for formally scheduled classes that require special-purpose equipment or a specific configuration for student participation, experimentation, observation, or practice. The specialized teaching lab limits the room’s use to specific disciplines.

Study spaces are areas used by individuals to study at their convenience and are not restricted to a particular subject or discipline. Study space includes dedicated study rooms, book stacks, and open study space.

### Classroom Space Standard Calculation:
\[
\text{Space} = \frac{\text{Avg. Student Section Size (SS)}}{\text{Factor}}
\]

Factor = (Avg. Weekly Room Use x Student Occupancy Factor) 
Minimum of 20 
Minimum of 15%

### Classroom Laboratory Space Standard Calculation:
(excluding College of Design Undergraduate Space)

\[
\text{Space} = \frac{\text{Avg. Student Section Size (SS)}}{\text{Factor}}
\]

Factor = (Avg. Weekly Room Use x Student Occupancy Factor) 
Minimum of 20 
Varies by Intensity Level

### Study Space Standard:

- Study Space ASF Standard = 25 ASF per station for (20% of FTE Students + 5% of FTE Faculty)

Additional details regarding the NC State Space Standards can be found in the Construction Guidelines, Section ED Planning and Design Space Standards and Programming.
Office Space
Office space includes individual offices, workstations and support spaces such as conference, file, break, and work rooms. The office space standard calculates Assignable Square Footage (ASF) based on four personnel categories: administrative, instructional / professional, technical / clerical, and graduate students. This type of space accounts for the largest percentage, at 30%, of university space, excluding university housing.

Research Laboratories
Research laboratories are used for experimenta- tion, research methods, professional research and observation, or structured creative activities. A new discipline-specific research space standard was adopted in 2012 to calculate lab ASF for research faculty, staff, post-doctoral, and graduate student headcount. Research space accounts for 17% of university space, excluding university housing.

Special Use
Animal facilities, research field buildings, greenhouses, athletic and physical education, army, and Arts NC State spaces are among the special use facilities. The majority of Special Use ASF is associated with research. NC State has not formally adopted a space standard for this category of space. Projections for this category vary by unit and are based on the unit’s strategic plan goals.

General, Support & Health Care
General, Support and Health Care space is comprised of student services space, typically found in student unions, recreation buildings, and other student services facilities. It includes spaces for meeting, assembly, recreation, lounge, exhibition, dining, and student health care. NC State has no space standard for this category. Future needs are identified through peer analysis and benchmarking.

NC State must have adequate quantity and quality of space to fulfill the university’s strategic plan.

Housing
The Campus Life Ten-Year Facilities Plan guides new and renovation projects for continued facility improvements. The plan addresses facility condition, quality, and student amenity upgrades. The plan also outlines provisions for additional beds over the next ten years. In fall of 2014, with the completion of Wolf Ridge at Centennial, NC State will house 44% of full time undergraduate students and 17% of full time graduate students.

University Housing plans to raze two high-rise structures, Lee and Sullivan halls, in 2025 and replace them with more human-scale buildings, resulting in a loss of 160 beds. A 2008 study to align the number of beds with university enrollment demand identifies additional building sites on the Centennial Campus Precinct. As the university seeks to accommodate planned enrollment growth, these site options will need further study.

The Greek Village Master Plan accommodates a total of 20 building lots plus a townhouse/apartment complex of 260 beds. Full build out of Greek Village will house approximately 1,000 students.
Space Efficiency and Space Utilization
Space is a limited resource that is allocated at the university’s discretion in accordance with university space principles and strategic goals. Capital projects require evaluation of space efficiency and utilization to ensure monetary resources are spent judiciously. The flexibility to repurpose space is necessary to maximize use, especially with the growing demand to support research with limited space resources. Interdisciplinary collaborative spaces, shared research facilities, and flexible space are priorities in space assignments and design.

Colleges and divisions are stewards of the space to which they are assigned and may undertake their own evaluations and reassignments. Although occupants may not directly pay to use space, it is not free. For example, annual operation and maintenance expenses cost the university over $2,000 for a typical office, over $9,000 for a mid-size classroom and over $16,000 for a mid-size lab.8

The Chancellor’s Faculty Excellence Program (CFEP),9 a plan to grow faculty positions in interdisciplinary clusters, promulgated the need for the colleges to identify office and research space for the Strategic Space Reserve.10 The amount of office and research space to be identified was based on the space deficit/overage percentages established in the 2012 College Space Analysis. The space given up by the colleges was primarily in poor condition, thus underutilized. The Strategic Space Reserve process resulted in three positive outcomes: strategic reallocations, better space utilization within each college, and renovated space to meet strategic plan goals.

Facility Condition and Quality
NC State has significant condition and quality deficiencies due to aging facilities and inadequate repair and renovation funding. The Facilities Condition Assessment Program (FCAP) identifies improvements to upgrade obsolete building systems and to meet contemporary standards. The program evaluates core facilities located within the five precincts focusing on academic, administrative, research, laboratory, and support facilities. After a facility is evaluated, a Facility Condition Index (FCI) is established, which is used to gauge the overall condition of a building. The FCAP identifies renovation and replacement projects, which informs the development of the Capital Improvement Plan.

**Facility Condition Index (FCI):**

\[
\text{FCI} = \frac{\text{Cost of Current Maintenance, Repair, and Upgrade Deficiencies of a Facility}}{\text{Current Replacement Value of Facility}}
\]

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8 Based on fiscal year 2011-2012 actual costs.
9 Chancellor Woodson announced CEFP on September 28, 2011.
10 University Space Committee initiated the Strategic Space Reserve on January 17, 2013.
Capital Improvement Plan Appropriated Projects

The NC State Capital Improvement Plan - Appropriated Projects are listed below in alphabetical order. The Appropriated Project List is reviewed periodically to establish priority order, project scope, and projected costs. The key projects are included in the six-year Capital Plan and submitted to UNC-GA as part of the biennium request. Specific program requirements for each project, including associated infrastructure, are established through the evaluation of space efficiencies, future academic and enrollment projections, space needs analyses, facility condition assessments, and university strategic initiatives.

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<tr>
<th>No.</th>
<th>Project Name</th>
<th>College or Function</th>
<th>Classroom ASP</th>
<th>Teaching Lab ASP</th>
<th>Research Lab ASP</th>
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<td>EGIS, CAES, COO, Interdisciplinary</td>
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<td></td>
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<td></td>
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<td>Jayner Visitor Center Addition</td>
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* Projected project cost escalated to 2019

precinct workshop

south campus precinct
Capital Improvement Plan

Appropriated Projects
1. Administrative Services IV
2. Broughton Hall Renovation & Addition
3. Building Lab Renovation
4. CVM Education Building
5. Danby Hall Renovation
6. Daniels Hall Renovation, Phase II
7. Design Teaching Facility
8. Engineering Bldg. - North
9. Engineering Bldg. - Oval
10. Facilities Services Building - CC
11. Gardner Hall Renovation & Addition
12. Hillenbrand Building Renovation
13. Joyner Visitor Center Addition
14. Mann Hall Renovation
15. Oval East Parking Deck
16. Page Hall Renovation
17. Parking Deck - CBC Addition
18. Plant Sciences Greenhouse
19. Plant Sciences Research Building
20. Poe Hall Renovation
21. Polk Hall Renovation, Phase II
22. Poole College of Management Facility
23. Science Commons Building
24. Teaching & Research Building (Hodges’ Site)
25. Utility Plant Addition - CBC
26. Utility Plant Addition - CC
27. Willis Deck - Phase II
28. Williams Hall Renovation

Non-Appropriated Projects
29. Commissary Addition
30. Centennial Recreation Center
31. Center for Leadership & Entrepreneurship
32. Fountain Dining Renovation
33. Greek Village Development, Phases I & II
34. Gregg Museum
35. Indoor Practice Facility
36. Music Building
37. Partners Building IV
38. Reynolds Renovation
39. University Child Care Center
40. Varsity Drive Recreation Field

Private Investment Projects
A. CBC Flex Building
B. Conference Center/Hotel - CC
C. North Shore Residential Phase I & II
D. Textiles Innovation Center
E. Town Center

Legend
- **Existing** Facility
- **Future** Renovation
- Recreation Facility
- Building
- Property Line

NC STATE UNIVERSITY
115
PHYSICAL MASTER PLAN 116
Campus Plans: Neighborhood Systems

The Campus Plans are graphic representations of the Master Plan Vision, Guiding Principles, and Design Guidelines. Capital Improvement Projects have been incorporated into the Campus Plans as future building footprints. The maps are planning tools to link physical and academic planning, strategic initiatives, capital priorities, space utilization and decision-making regarding future development, ensuring the physical environment enhances the fulfillment of the university mission.

NC State is made up of human-scaled Neighborhoods and their Open Spaces, Hallowed Places, and Campus Edges connected by paths designed to meet the needs of people as they interact with each other and the spaces around them. These maps inventory existing conditions and activities and indicate a plan for the future, drawing on successful existing parts of campus.
Campus Paths and Shared Open Spaces

Each Campus Neighborhood’s buildings’ location and orientation is critical to defining the six distinct types of Shared Open Space: Campus Greens, Courtyards and Plazas, Campus Streets, All Campus Paths, Campus Edges and Natural Areas. These spaces are the focal points of neighborhoods and are nurtured by or created by all projects.

Individual Campus Neighborhoods and their Shared Open spaces are woven together into a coherent whole by a hierarchical system of pedestrian paths, scaled to move people efficiently through campus: All Campus Paths, Connector Paths, and Neighborhood Paths. The All Campus Paths are the campus’ most lively pedestrian movement zones and connect all parts of the campus and major Exterior Hearths. Their design includes amenities and landscaping that add to the pedestrian experience. The All Campus Paths will continue to be enhanced as a major design characteristic and an outdoor amenity for the university.

Legend

**EXISTING**
- All Campus Path
- Connector Path
- Neighborhood Path
- Multipurpose Path
- Shared Open Space
- Major Pedestrian Entrance
- Building
  - Property Line

**FUTURE**
- All Campus Path
- Connector Path
- Neighborhood Path
- Multipurpose Path
- Fixed Guideway Transit
- Tunnel/Bridge
- Building
Hallowed Places, Landmarks, and Public Art

Hallowed Places, Landmarks and Public Art are unique features that characterize NC State and contribute to the campus identity. Hallowed Places are campus buildings, landscapes, or natural settings that have accrued special meaning over time. Landmarks aid in wayfinding and are distinctive and dominant features, a feature in building architecture, a free-standing object in the landscape, a Hearth, a Natural Area, or Public Art. The opportunity to create new Landmarks may be considered in building design. Public Art can give Neighborhoods a memorable focal point, or can act as a subtle detail that waits to be discovered. They are often designed to allow viewer interaction.

All are given careful consideration during planning. Changes affecting Hallowed Places require extraordinary care to preserve their special nature and are considered only in consultation with the campus community.

Legend

Hallowed Places
- Map symbol

1. Postage Stamps of the College of Veterinary Medicine
2. Postage Stamps of University Plaza
3. The Court of North Carolina
4. Memorial Bell Tower
5. Hallowed Hall
6. Mary Fromm Court
7. UNCG Free Expression Tunnel
8. Reynolds Coliseum
9. Lake Raleigh Woods

Legend

Landmarks
- Map symbol

1. Daily Breeze
2. Carter - Tinker
3. D.H. Hill Library
4. Pulon Road Roundabout
5. Brooks Hall
6. Smith Hall
7. Sallie Tower at West Duke
8. Blagoev Hall
9. Honors Village Cupola
10. Jordan Hall
11. Centennial Alumni Gateway
12. Pedestrian Bridge
13. Tower at Tower Hall
14. Hunt Library
15. Lane Raleigh
16. Linnard Poynter Golf Course
17. Technology Tower at Talley Student Union

Legend

PUBLIC ART
- Map symbol

1. Wolfpack "L"f
2. Compositions
3. Swimming Retrievers
4. Hannah
5. The Necessary Final
6. William Friday
7. Listening Wedges
8. Wolf Face?
9. Pedestrian Bridge
10. Fit to be Tied
11. Upward (The Egg)
12. Wolf Walk
13. Coxehe Corner
14. Surveys
15. Light Ribbon
16. Liquid Order
17. Wolves
18. Wolves
19. Calvin L. Carter, II
20. Locke Sulloway
ARCHITECTURAL REMNANT
21. The Golden Section in Simmons Plaza
22. The State of North Carolina at Jordan Hall
Natural Systems

When respected as an amenity and enhanced, existing landforms, vegetation, waterways and Natural Areas provide Campus Neighborhoods with unique character. Neighborhoods and Shared Open Spaces are connected to these landscape features and Natural Systems through the Campus Path system and by connecting to the City of Raleigh paths system.

The designs of all projects give Natural Systems careful consideration. Stream corridors are protected, tree canopies over streams and streets are enhanced or established, stormwater design and control measures are preventive and are integrated into a campus-wide system; and views from major campus promenades are enhanced. During construction and later maintenance, the least intrusive techniques are used in Natural Areas to ensure their continued health.

* Peak elevations are significant promenades that offer unique views into and from campus. Preservation and enhancement of these views shall be considered in the development of these areas.
Mixed Use Activities
Having a mix of uses and activities is one of the most important factors in the creation of vibrant, successful Campus Neighborhoods. Each Neighborhood may have a predominant activity (academic, research, residential, etc.) yet be home to a variety of activities and places that invite people from across the campus. Projects improve Campus Neighborhoods by contributing to the mix of public activity spaces that encourage people to intermingle: study space, galleries, libraries, dining, and interior and exterior gathering spaces. To ensure that each project contributes to the enhancement of the Neighborhood, an assessment of existing Neighborhood uses and amenities is essential to planning of new or renovated facility projects.

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<td>Building</td>
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<tr>
<td>Property Line</td>
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The Campus Plans are graphic representations of the Master Plan Vision, Guiding Principles, and Design Guidelines. Capital Improvement Projects have been incorporated into the Campus Plans as future building footprints. The maps are planning tools to link physical and academic planning, strategic initiatives, capital priorities, space utilization and decision-making regarding future development, ensuring the physical environment enhances the fulfillment of the university mission. These maps inventory existing conditions and future plans to accommodate pedestrian and vehicular paths and coordinate with a multimodal transit system to strengthen the Pedestrian-Oriented campus.
Vehicular Paths

Vehicular Paths provide for transportation to and through the campus. Vehicles are conveyed to campus entries, via regional Interstates, Arterials and Thoroughfares, where they transition to Collector Streets and smaller Neighborhood Streets. To reduce passenger car movement through campus, large parking areas are located near Thoroughfares and Collector Streets found at campus perimeters. Personal car movement may be restricted within the cores of campus precincts and on Neighborhood Streets. Alternative transportation routes are provided by linking campus multi-purpose paths to the greater city greenway system.

Legend

EXISTING

- Interstate
- Arterial
- Thoroughfare
- Collector Street
- Multipurpose Path
- Building
- Neighborhood Street
- Property line

FUTURE

- Collector Street
- Multipurpose Path
- Building
Parking
Parking facilities are places where people make the transition from being drivers to being pedestrians. These facilities are integrated into the Campus paths System so that people can easily access transit and pedestrian paths that will take them to campus destinations. Personal vehicles are directed to large collector lots at campus perimeters to minimize the impact of traffic through campus. Neighborhood parking off interior Campus Streets is available for service vehicles and accessible parking.

Legend
EXISTING
- Structural Parking
- Surface Parking
- Building
- Property Line
FUTURE
- Structural Parking
- Surface Parking
- Parking Relocation
- Building
Transit Paths
Various modes of interconnected transport systems enhance the pedestrian network and are essential to the successful movement of people to and around campus. Wolfline bus system connects campus precincts, large parking areas, and housing so people may conveniently get to campus destinations via the bus. Bus priority, light rail, and fixed guide way corridor and station locations are reserved for successful multi-modal transit travel throughout campus. Future precinct and neighborhood development accommodates convenient multi-modal transit options.

Legend
EXISTING
- Bus Route
- Transfer Hub

FUTURE
- Bus Route
- Priority Corridor
- Light Rail Route
- Fixed Guide Way Route
- Fixed Guide Way Station
- Commuter Rail Station
- Light Rail Station
- Building
- Property Line
Campus Plans: Utility Systems

The Campus Plans are graphic representations of the Master Plan Vision, Guiding Principles, and Design Guidelines. Capital Improvement Projects have been incorporated into the Campus Plans as future building footprints. The maps are planning tools to link physical and academic planning, strategic initiatives, capital priorities, space utilization, and decision-making regarding future development, ensuring the physical environment enhances the fulfillment of the university mission.

NC State’s utility systems are developed as centralized district systems to conserve resources, increase energy efficiency, and enhance sustainable development. These maps inventory existing conditions of utility distribution and indicate a plan for the future to maximize space for university activities. Individual service connections to buildings are not represented.
Domestic and Reuse Water Systems

The university owns the domestic water systems for the campus with the water provided by the City of Raleigh. These systems are designed for redundancy and reliability to reduce outages for the campus. Precincts that are not served by a master meter conform to the City of Raleigh utility connection standards.

Phase one of the university-owned reuse water system has been implemented on Centennial Campus Precinct with subsequent phases to be installed. This phased implementation allows the community to better manage the water rights for the region. The reuse water program reduces reliance on Lake Raleigh for irrigation, thereby improving the lake's use for recreation.
Chilled Water
The university owns and operates district steam distribution systems on the North, Central, Centennial, and West Precincts for heating and process loads. Distribution is through a system of underground walkable tunnels or direct buried piping systems. Central distribution of steam has a longer service life and reduces life-cycle costs as compared to numerous smaller plants, and contributes to efficient development by employing automated load shedding controls. Expansion of the central utility plants and construction of additional piping is projected to serve additional facilities as they are built or renovated.

Central distribution of steam benefits the campus in other ways:
The reduction of building-level equipment contributes to the enhancement of Design Harmony.
The creation of loops minimizes interruptions to university activities during repairs to a district system.
Combined heat and power technologies reduce operating costs and allow for the use of bio-mass for fuel.
Central Steam Distribution
The university owns and operates district steam distribution systems on the North, Central, Centennial, and West Precincts for heating and process loads. Distribution is through a system of underground walkable tunnels or direct buried piping systems. Central distribution of steam has a longer service life and reduces life-cycle costs as compared to numerous smaller plants, and contributes to efficient development by employing automated load shedding controls. Expansion of the central utility plants and construction of additional piping is projected to serve additional facilities as they are built or renovated.

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The reduction of building-level equipment contributes to the enhancement of Design Harmony.
The creation of loops minimizes interruptions to university activities during repairs to a district system.
Combined heat and power technologies reduce operating costs and allow for the use of bio-mass for fuel.

Legend
EXISTING
- Steam Water Plant
- Steam Water Piping
- Building

FUTURE
- Steam Water Plant
- Steam Water Piping
- Building
- Property Line
Primary Electric

The university owns and operates medium voltage electrical distribution systems on its five precincts which serve the majority of its buildings. This duct bank and underground distribution system protects the design integrity of the Campus Neighborhoods and Paths and allows the university to maximize its space for university activities.

The university has developed standards for interconnection and net metering. Bulk power is purchased from Duke Energy. Progress except for remote or small university buildings and existing research operations. The system will be extended as facilities are constructed or renovated.

The distribution system enhances the campus in other ways:

- The use of underground duct-banks for distribution improves reliability of service.
- It provides a higher level of security for sensitive tasks related to incorporation of smart grid technologies that will further improve the reliability and reduce energy consumption on campus.
- It improves the quality of service.
- It improves public safety.
- It reduces operating and maintenance costs.

Legend

- **EXISTING**
  - Electric Plant
  - Electric Line
  - Building

- **FUTURE**
  - Electric Plant
  - Electric Line
Telecommunications
The university strives to design and construct infrastructure to support multiple generations of network and communication technologies in a supportable, cost effective, and efficient manner. NC State owns and operates an extensive underground fiber optic network infrastructure connecting virtually all buildings on campus. This network backbone is housed in concrete-encased duct banks, including redundant paths between Central and Centennial Precincts. The buildings are also equipped with pervasive, robust, and standardized intra-building network infrastructure to support a variety of voice, data, and video/TV services.

The university owns and operates an extensive Wi-Fi network to provide mobile connectivity to students, faculty, staff, and guests throughout the campus. Most major academic and administrative buildings have full wireless coverage as do most of the exterior Shared Open Spaces. This wireless infrastructure is constantly being expanded and upgraded to meet the rapidly increasing wireless demands of the campus community.

Underground wiring enhances the design integrity of the campus and maximizes the space available for university activities. Equipment and other infrastructure above ground and in buildings contribute to the enhancement of Design Harmony.
Appendices
History:
The Physical Development of NC State University

Few if any of NC State’s founders foresaw the growth that the university has experienced. Early design efforts focused on a much smaller campus than today’s twenty-one hundred acres and over 14.7 million gross square feet of built space accommodating a community of over forty-five thousand people. And history intervened in ways that often focused planning on near-term rather than long-term needs. Many of the Courtyards, Open Spaces, and walkways in the older sections of the campus appear to have been part of an original intention but in fact were nurtured and developed piece by piece over the years.

From the university’s pastoral beginning along Pullen Road, enrollment and facilities grew steadily and moderately until the end of the First World War, after which they accelerated. Plans of the 1920s called for grouping buildings that housed like activities, such as the agriculture and engineering groupings on the North Campus, classrooms around the Court of North Carolina, the university administration near Holladay Hall, athletics around Ridick Stadium, and student residence halls south of the railroad.

During the Great Depression, the university lost several graduate programs, and its progress was in jeopardy. Planning for expansive growth was not a priority. After the Second World War, however, enrollment surged, many graduate and research programs were restored or started, and the university embarked on an optimistic course of growth that continues to the present.

NC State’s first postwar physical master plan was created in 1958, the same year the university’s first modern long-range strategic plan was written. The physical master plan brought some coherence to a burgeoning campus, but while it was meant to help the university achieve other strategic long-range goals, it did not become a formal part of the strategic planning process. Adherence to the master plan was desirable but not mandatory.

The 1958 plan divided academic activity from student activity into North and South Campuses, respectively. It established a central pedestrian area (University Plaza), suggested moving vehicular traffic to the campus’ periphery, and dispersed some new construction into all areas of a six-hundred-acre campus.

In 1960 the university established the Campus Planning Office, which updated the 1958 plan. It defined a compact, high-rise, pedestrian-scaled campus with all essential services within a ten-minute walking radius. The plan for the university’s urban center was thus established.

In 1963, several points of the 1958 plan were reemphasized, including zoning of the academic campus around D. H. Hill Library and focusing student activities on a new South Campus student center and gymnasium.

“Campus Environment and Planning System,” a 1968 in-house report, endorsed the compact campus center but also suggested some decentralization through dispersal of activities. This marked the emergence of the idea that the campus could be a group of neighborhoods. The university was growing into an academic town parallel to Raleigh’s growth into a mid-size city.

As the decentralization of some activities started, campus planners also began to set aside open spaces around which clusters of buildings could be grouped and around which pedestrian and vehicular traffic could be directed. That concept was formalized in 1975 when “A Framework of Courtyards.” proposed that the campus be viewed, and in the future be developed, as a system of interconnect- ing neighborhoods. Because of the university’s continued growth, decentralization had become a fact of life as the campus expanded beyond the compact core. The open space network emerged as a means of giving coherence and unity to the campus.
The 1978 Physical Master Plan reemphasized the importance of courtyards and connectors to campus design and, for planning purposes, divided the growing campus into a series of precincts, based on the integration of geography and land use.

In 1982, the system of interconnected courtyards, with accompanying strategies for traffic flow, was used in the siting of new buildings. Decentralization continued, with substantial infill. The concept of decentralization with interconnection was reemphasized in the 1983 “Space Inventory and Potential” report that focused heavily on the development of the university’s satellite areas as well as the core campus.

When in 1984 the university announced its intention to build Centennial Campus on the state’s initial allocation of 386 acres of land from the Dorothea Dix Hospital property, immediately south of the original campus, it created a unique planning opportunity. Centennial Campus, unlike the original campus, would have the benefit of a far-reaching master plan from the start.

The Centennial Campus Master Plan, approved by the Board of Trustees in 1987 and its accompanying Design Guidelines formalized principles that had emerged on the original campus. The new campus would be composed of “related villages, neighborhoods and courtyards - each a distinctive place whose character is defined by a diverse architecture that provides life and animation and is connected to the site’s natural landscape. The campus composition intends to be a fabric with emphasis on the spaces between the buildings rather than on individual buildings.”

By formalizing the concepts that had emerged organically from the development of the original campus, the Centennial Campus plan guidelines laid the foundation for the 1994 Physical Master Plan. Both called for the integration of institutional activities into Mixed-Use communities. The high quality of the development on Centennial Campus from its inception to the present represents the efficacy of the concepts and guidelines that were formally applied to the entire campus with the 1994 plan. These have shaped substantial new building efforts not only by the university but also by public and private partners who have benefited by utilizing the planning standards. Centennial Campus emerged as an exemplary model of a Mixed-Use academic and research campus.
It was with the 1994 plan that the term Campus Neighborhood entered the vocabulary of the wider campus community. The subsequent 2000 master plan, A Campus of Neighborhoods and Paths had grown directly from and was built on the 1994 plan via a campus-wide planning process. In 1997, Chancellor Larry Monteith initiated a workshop process for North Campus that focused particularly on two large spaces with development potential: the Riddick Stadium parking area and the land occupied by the North Campus greenhouses. The North Campus Workshop produced specific plans for the new Fox Science Teaching Laboratory and, perhaps even more important, established a collaborative model for campus planning. This model was used in five additional workshops covering the remaining campus precincts. All workshops were chaired by Smokey York, chair of the Trustees Buildings and Property Committee, and attended by a broad cross section of stakeholders representing the precinct and community. The precincts, which had become the focus of campus development in the 1978 master plan, remain a useful division of the campus, and much infrastructure development and wayfinding is still based on existing precinct plans. Designers and planners continue to use many maps that divide the campus into precincts, and reference can be found to them in numerous planning documents. The concept of Campus Neighborhoods and Campus Paths rather than precincts, however, determine the character of the NC State Campus.

The precinct workshops became the basis for updating the 1994 master plan, and a significant theme arose from them—a clear demand for a more beautiful campus, one enlivened with more green space and oriented toward pedestrians. Participants also voiced overwhelming support for transportation alternatives, including the Triangle Transit Authority’s proposed regional rail system and the envisioned campus people-mover system. Additionally, with the decision in 1997 to move the College of Engineering to Centennial Campus came the need to plan for other facilities such as housing and dining to support the significant number of undergraduate students in the college. When work on A Campus of Neighborhoods and Paths started in 1998, these ideas became important principles.

As the precinct workshops and the revision of the master plan were underway, other significant physical planning events occurred that have had an effect on A Campus of Neighborhoods and Paths and the way it will be implemented. The Board of Trustees established the Campus Design Review Panel to guide design decisions. The workshops produced new partnerships through the community collaboration. The Hillsborough Street Partnership created a vision for a quintessential city-university interface, and today the street continues to be revitalized through investments in the streetscape.

In the late 1990’s, the planning process was influenced by an increased role played by University of North Carolina - General Administration (UNC-GA) as space standards and repair and renovation formulas were established. A 1999 system-wide report identified substantial facility needs, which were included in a ten-year capital improvements plan. The inclusion in the 2000 master plan of the Capital Improvement Plan tied the vision of a memorable campus to the concrete programmatic demands of a growing institution.

On November 7, 2000 the voters of North Carolina approved a higher education bond referendum, which funded $473 million of capital projects that added more than 1.3 million square feet of new space and renovated more than 900,000 square feet of existing space between 2000 and 2009. Also during this timeframe, an additional $725 million of non-bond funded projects were planned and constructed, renovating facilities, adding new buildings, and providing infrastructure. NC State was poised and ready for this period of rapid growth, in part due to the Guiding Principles, planning concepts, and priorities developed with the 2000 edition of A Campus of Neighborhoods and Paths.
During this time of unprecedented growth, parts of campus were completely transformed, and new neighborhoods were created around Shared Open Spaces.

In 2004, Fox Science Teaching Laboratory, along with David Clark Labs modernization and addition, created Governors Scott Courtyard, a major outdoor gathering space designed in accordance with the master plan principles.

In 2005, the remaining portion of old Riddick Stadium was demolished to make way for SAS Hall which helped to form a new Plaza on Stinson Drive.

Following the decision to relocate the College of Engineering, the completion of Engineering Buildings I, II and III began to define The Oval, the largest Shared Open Space for Centennial Campus Precinct.

Main Campus Drive was extended, providing connectivity not only within Centennial Campus Precinct, but also between Raleigh neighborhoods.

The long-standing dream of creating the Free Expression Tunnel as an accessible pedestrian connection under the railroad right-of-way, connecting North and Central Campus Precincts, was realized.

The Rocky Branch Stream Restoration project, which features an adjacent Multipurpose Path, restored the stream corridor and created a campus amenity that fulfills the master plan’s Guiding Principle of a connected, Pedestrian-Oriented Campus.

The 2002 Library Master Plan study identified the need for a library to serve the specific needs of Centennial Campus and to address the significant shortage of student study space.

When the Physical Master Plan was updated in 2001, the workshop process again identified issues important to the university community. These issues were further explored through task force discussions and studies, resulting in recommendations to refine the plan.

An emphasis on Sustainability led to the creation and expansion of standards to commit to campus growth and change that includes protecting, enhancing and restoring environmental systems and resources, and to provide facilities that manage, conserve, and generate resources.

The continued desire to create a pedestrian-focused campus resulted in adding plans for a pedestrian tunnel under Western Boulevard, a bus priority corridor to improve the speed and reliability of service between campus precincts, and a multipurpose trail loop around the College of Veterinary Medicine.

The need to recognize, preserve and enhance the university’s places that hold special meaning to the community resulted in establishing the concept of Hallowed Places as a Guiding Principle. A community-wide discussion resulted in the designation of nine Hallowed Places.

While the 2000 plan showed extensive development south and west of Lake Raleigh, the community expressed that the woodlands should be valued as a natural resource and an amenity, with the intent to preserve the area for teaching, research and recreation. The approximately 100-acre Lake Raleigh Woods was established, selected as a Hallowed Place, and the development previously planned for the area was taken off of the plan.

The state’s allocation of an additional 131 acres east of Centennial Parkway (Spring Hill) was incorporated into the master plan, increasing the size of the Centennial Campus Precinct.

While the 2000 plan increased the focus on creating neighborhoods around beautiful shared open spaces and connecting those neighborhoods with a system of pedestrian-focused paths, the need to address the many edges and borders of campus was identified during the 2007 update. In order to outwardly express the beauty and coherence of the campus interior to the public, the plan established standards for Campus Edges and for Gateways. These guidelines provided a framework to reflect the character and beauty of campus, and to have these edges serve as a recognizable transition between the campus and surrounding community.
**Process:**

**Master Plan Update 2000 to 2014**

NC State University’s approach to physical master planning is to constantly examine campus needs as they evolve. Rather than calling on one campus planning generalist to update the master plan every ten years or when the university assumes new leadership, NC State continually enlists subject-matter experts to lead more focused efforts based on a specific geographic area or topic; e.g., student housing. These plans and studies are then folded into each master plan update through a process that further engages the campus community. At the start of the 2014 Master Plan Workshops, the impact issues that had been identified in the recent plans and studies were introduced to generate comments and ideas in need of further consideration, and to determine their relative priority. In addition, planning staff conducted Focus Groups consisting of designers and project management staff who had used the 2007 Physical Master Plan in order to learn what was working well and, more importantly, what needed to be added or improved in the 2014 update. A Workshop Summary Report captured the comments and issues generated in the workshops. Ten Task Forces were established and charged with updating a specific part of the master plan. They used the Workshop Summary as the framework for study and discussion, and made recommendations to refine the 2014 plan.

Master Plan Studies, since 2007, incorporated into this master plan update include:

- Gateway Branding Design (2008)
- Centennial Campus Dining Study (2008)
- College of Agriculture and Life Sciences Space Study (2008)
- College of Engineering Space Study (2010)
- Student Housing Study (2008)
- Student Life Master Plan (2008)
- West Lot Master Plan (2008)
- Gregg Museum Site Selection Study (2010)
- Cates Avenue Master Plan (2010)
- Recreational Sports Master Plan (2011)
- Bicycle and Pedestrian Master Plan (2011)
- Town Center Massing and Capacity Study (2012)
- Tree Master Plan at The Oval (2012)
- McKimmon Center Courtyard Master Plan (2012)
- Yarbrough Drive Master Plan (2013)
- Main Campus Drive Street Tree Master Plan (2013)

Building studies initiated for new programmatic needs, building condition issues, and/or re-purposing of space, since 2007, incorporated into this update include:

- Cherry and Council Buildings (2010)
- College of Engineering Building Studies (2013)
- Music Department Building Feasibility Study (2011)
- BTEC Addition (2013)
- CVM Education Building (2013)
- Plant Sciences Building (2014)
- Entrepreneurs Garage (2014)
- Bureau of Mines Building (2014)

NC State endeavors to integrate the campus into the land-use and socio-economic context of the City of Raleigh and has collaborated on several regional planning efforts. Planning efforts, since 2007, which have influenced this update include:

- Light Rail and Commuter Rail Station Location Planning (Triangle Transit, 2011)
- Blue Ridge Road District Study (City of Raleigh, 2012)
- Blue Ridge Road/Hillsborough Street Intersection Planning (NC Department of Transportation, 2012)
- Western Boulevard Crossing Study (Capital Area Metropolitan Planning Organization, 2013)
Key Terms:

All Campus Path:
The campus’s most lively pedestrian movement zone, reserved for people-powered movement, connecting all parts of the campus and major exterior Hearths with a wide path and pedestrian amenities that create a special place to be. It is the scenic route by which a pedestrian experiences key campus locales. It currently consists of various walkways around campus but over time will be enhanced to become a major design characteristic and an outdoor amenity for the university.

Campus Neighborhood:
The key planning and fundamental physical building block of the campus. Neighborhoods may have diverse characters, but all contain a mix of uses, have a sense of self-contained place, and are focused around a Shared Open Space.

Campus Paths:
Any transportation route, from a footpath to a major transit route. The word path is used when describing streets and transit routes to emphasize the point that the campus is, for the most part, pedestrian oriented.

Character Places:
Areas of special note and recognition that help define the identity of Campus Neighborhoods. They include Exterior Hearths, Landmarks, the All Campus Path, and Landscape Features.

Design Guidelines and Standards:
Conceptual definitions and development instructions in this plan to be followed in all projects.

Hallowed Places:
Irreplaceable campus buildings, landscapes and natural settings that have accrued special meaning, and are unique or symbolic to NC State. These are places that have created lasting bonds with the university throughout generations of students, faculty and staff.

Hallowed Places are the Court of North Carolina, the Free Expression Tunnel, Holladay Hall, Mary Yarbrough Court, the Memorial Bell Tower, Pastures at the College of Veterinary Medicine, Reynolds Coliseum, Lake Raleigh Woods, and University Plaza “The Brickyard.”

Hearths:
Campus gathering areas and social centers, both indoors and outdoors. These may be of various sizes and functions, from the eating area at University Plaza to the office coffee area in an alcove.

Hubs of Interaction:
A campus neighborhood site generating numerous interactions between and among people through a variety of activities. This variety of activities and uses in campus neighborhoods, both interior and exterior, creates a diverse environment for people to enjoy. A Hub of Interaction may be small, for example, a coffee pot station located off a public corridor or large, such as University Plaza, a site where many gather sponsored outdoor events for the whole campus community.

Human Scale:
The design and arrangement of buildings and landscape features to accommodate human perception, activity, and social organization. Measures for Human Scale include human reach, stride, mobility and perceptual ranges.

Life-cycle costs:
The true costs of a building over time, including projections of maintenance, renovation, repair, operation, and demolition arising from the original design and materials.

Master Planning Process:
A framework for decision-making about future NC State campus’s development. The process is open to the public.

Mixed Use:
The integration of a variety of activities and functions in open spaces and buildings to encourage contact and communication between people and the cross-fertilization of ideas.

Pedestrian-Oriented Campus:
A campus environment that is safe, accessible, convenient, and comfortable for pedestrians so they may move easily from one campus destination to another conveniently without use of a motorized vehicle. A campus master plan strategy for reducing dependency on vehicular traffic.

Shared Open Space:
A large, well-defined outdoor area that gives physical definition to a Campus Neighborhood.

Universal Design:
The design of products and environments so that they are usable by all people to the greatest extent possible without the need for adaptation or special features. The concept of universal design originated at NC State.
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Index:

A
All Campus Path 8, 13, 74-76, 80-81, 181
Administrative Space 66
Arcades 52-53, 57

B
Bicycles 80, 89, 91
Buildings and Their Details 51-68
Bus Layover 94, 97
Bus Station 94
Bus Stop 94-95, 99
Bus Transit 93-95

C
Campus Edges 26, 28, 35
Campus Greens 26, 28, 30
Campus Neighborhoods 5, 13-16, 156, 161
Campus Paths 5, 6, 73-84, 156, 161
Campus Safety and Security 12, 14
Campus Street 28, 33-34, 87, 89
Campus Vision 5-8
Capital Improvement Plan 113-116
Character Places 26, 39-43, 161
City Context 12, 19
Classrooms 44, 45, 62-63, 71, 107-108, 181
Color 55-58, 67-68, 71, 78, 79
Collector Lots 74, 97, 99
Collector Street 74, 88-89
Community Interface 26, 46
Courtyards 28, 32-33

D
Design Guidelines and Standards 5-6, 25-100, 161
Design Harmony 12, 14

E
Ecosystems 26, 47-50
Entrances 26, 30-34, 46, 55, 59, 67, 76, 78, 95
Exterior Elements 26, 55
Exterities 69
Exterior Hearths 26, 39, 62, 161

F
Fixed Guideway Transit 95

G
Gateways 74, 85
Glazing 56
Guiding Principles 5, 9-16

H
Hallowed Places 12, 26, 39, 41-42, 159, 161
Hearth 39, 61-62, 161
History 151-158
Housing 65, 109
Hubs of Interaction 26, 43, 161
Human Scale 8, 12-14, 26, 29, 91-92, 161

I
Integrated Planning 11-12
Interiors 26, 61
Interior Hearth 26, 39, 61-62

J
Landmarks 26, 39, 40, 161
Landscape Features 26, 37-39, 43, 161
Learning Space 62-63
Life-cycle cost 89, 161
Living Spaces 64-65
Living and Recreation Places 26, 47, 84-85
Lobbies 16, 26, 45, 59, 63, 91

K
Metal 56
Materials 55, 70, 76
Masonry 55
Master Planning Process 10, 11, 12, 161
Mixed-Use 12, 16, 161
Multipurpose Path 84

L
Masonry 55
Master Planning Process 10, 11, 12, 161
Mixed-Use 12, 16, 161
Multipurpose Path 84

N
Natural Areas 26, 37
Neighborhood Paths 74, 83
Neighborhood Streets 26, 33-34, 89
NC State Style 26, 63-64, 68

O
Office Space 66, 109
On-Street Parking 100

P
Parking 74, 89, 90, 96-100
Patterns 76
Precincts 5, 18
Parking Decks 52, 74, 89, 91, 97
Pedestrian Paths 26, 74, 75-86
Pedestrian-Oriented Campus 12-13, 87, 162
Plazas 26, 28, 31, 76
Portals 74, 85
Priority Corridor 74, 93
Public Domains 46

Q
Recreation 45, 47, 84, 159
Research Space 63, 109
Residence Halls 64-65, 109
Rooftops 57-58

S
Service Areas 67
Shared Open Space 26, 28-39, 52, 65, 68, 70, 90, 161-162
Sharrow 89-90
Space Efficiency and Utilization 111
Space Standards 107-110
Steps 57
Support Space 66
Sustainability 12-13, 26, 69-72
Sustainable Design 26, 69-72

T
Teaching and Learning Space 26, 62-63, 107-108
Transfer Hub 94, 96
Transit Paths 74, 93-95
Transition Places 96
Thoroughfare 74, 88, 96
Transit 13, 74, 88, 90-91, 93-95, 96

U
Universal Design 12, 15-16, 59, 63, 75, 76, 80, 162
Utility Infrastructure 68

V
Visibility of Activities 16, 26
Visible Neighborhood Activities 45
Vehicular Gateways 92

W
Walls 57
Wayfinding 35, 40, 43, 51, 58, 74, 79, 85
Windows 56-57
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