

LEARNING ENVIRONMENT

Introduction

The following white paper focuses on trends and opportunities related to learning environments. While we recognize that learning happens everywhere, this paper focuses on instructional, research, and study spaces. The University's strategic plan sets the tone and aspirations relative to these areas and is outlined in the following section.

Supporting the Strategic Plan

Framework planning offers the opportunity to physically translate an institution's strategic and academic missions. Thomas Green Clemson's initial vision for the campus of being a "high seminary of learning" still lives on today. Clemson is recognized as a top-25 public university. The University's Strategic Plan, *ClemsonForward*, articulates its desire to be recognized among the top 20 public universities; reaffirms its mission as a land grant; and charts a course grounded in four strategic priorities to achieve its vision. Relevant excerpts from *ClemsonForward* follow:

Mission

"Clemson University was established to fulfill our founder's vision of "a high seminary of learning" to develop "the material resources of the State" for the people of South Carolina. Nurtured by an abiding land-grant commitment, Clemson has emerged as a research university with a global vision. Our primary purpose is educating undergraduate and graduate students to think deeply about and engage in the social, scientific, economic and professional challenges of our times. The foundation of this mission is the generation, preservation, communication and application of knowledge. The University also is committed to the personal growth of the individual and promotes an environment of good decision making, healthy and ethical lifestyles, and tolerance and respect for others. Our distinctive character is shaped by a legacy of service, collaboration and fellowship forged from and renewed by the spirit of Thomas Green Clemson's covenant."

Strategic Priorities

The following strategic priorities were identified in *ClemsonForward*, along with specific strategies for success that provide guidance for the Framework Plan.

Research: Clemson will be nationally recognized as a leader in research, consistently ranked among institutions with the highest level of research activity.

- Refocus research mission and increase nationally competitive scholarship and funding in six innovation clusters: Advanced Materials; Cyber-Infrastructure and Big Data Science; Energy, Transportation and Advanced Manufacturing; Human Resilience; Health Innovation; and Sustainable Environments

- Grow targeted research investments
- Raise research expectations and reward research excellence

Engagement: Clemson will continue to be recognized as a leader in engagement, encompassing student engagement, community outreach and public-private partnerships.

- Build a campus-wide global engagement infrastructure
- Foster evidence-based academic engagement
- Enhance engagement opportunities across academic affairs and student affairs
- Leverage innovation campuses and research centers to support community engagement and economic development in South Carolina

Academic Core: Clemson will protect and strengthen the academic core, ensuring that it remains perennially ranked among the nation's top public universities.

- Re-envision general education
- Build interdisciplinary capacity
- Increase the number of high-quality, nationally prominent graduate programs
- Professionalize academic advising and curriculum resources

Living: Clemson will enhance the living environment to make the University an outstanding place to live, learn and work while also increasing diversity and a climate of inclusive excellence.

- Increase diversity all across campus
- Nurture a climate of diversity, inclusion and respect
- Lead the nation in rewarding top performance and advancing workplace quality of life

With the Strategic Plan as our guide, the Framework Plan needs to provide the space—notably classrooms, teaching labs, research labs, and study space—to support these aims over the next ten years. Please refer to the Clemson Family white paper for additional discussion around growth.

Trends

Technology and pervasive digital exposure have influenced the way students learn, teachers teach, and researchers work, and has brought about significant changes in the physical spaces to support learning.

We are seeing an increasing demand for **self-directed learning**, which has prompted the need for a **wider spectrum of learning spaces**. The role of the library and physical spaces within have perhaps transformed most significantly as a result. Libraries are widely considered learning commons; their reduced collection sizes have increasingly made way for a wider spectrum of learning spaces from areas for individual study, to group study rooms, and informal areas for discussion and collaboration. Please refer to the following blog post about the reinvention of libraries: <http://www.sasaki.com/blog/view/823/>

- **The socialization of learning** and penchant for collaborative learning and group work has prompted the creation of **active learning classrooms**—larger classrooms set up around tables that are digitally equipped and supported by multiple instructors. The **role of the instructor** has also changed as a result. The traditional “sage on stage” style of learning where an instructor presents information to a class has increasingly shifted the “guide on the side.” Rather than functioning as the gatekeeper of all knowledge, teachers now direct individuals and groups toward knowledge. By encouraging students to find the solution themselves, they are better equipped to retain that information.
- **Applied learning** helps form connections between what is learned in the classroom and how that knowledge is applied outside the classroom. This has resulted in increasing **collaboration between academic institutions and industry**—and takes the form of research labs, incubator spaces, programmatic partnerships, etc. Providing exposure to industry equips students with relevant skills and helps form connections to potential future jobs.
- Another form of applied learning manifests itself differently—in the form of **making and hands-on learning**. The ability to make, experiment, and test makes learning come alive and provides for real time iteration and questioning. The recent proliferation of **maker spaces** distributed throughout campuses is a direct result of this phenomenon.
- This desire to make and test is in many ways an expression of today’s **start-up culture**, and blends both applied learning with hands-on learning. This way of thinking helps put ideas into action. The emphasis on prototyping, invention, and reinvention, with the goal of connecting it to the marketplace has prompted the **creation of spaces that support entrepreneurship**.
- Lastly, the blurring of boundaries and collaboration across departmental lines prompts the need for additional spaces to support **interdisciplinary** thinking.

Considerations

Clemson University offers more than 80 undergraduate majors and 110 graduate degree programs, largely concentrated on the main campus, supported by additional facilities at the innovation campuses and throughout South Carolina and abroad. The recent reorganization of the Colleges reinforces the creation of likeminded academic units and aligns with research growth areas around engineering, agriculture, and science.

Academic and research facilities on the main campus total roughly 1.5 million assignable square feet of space associated with classrooms, teaching labs, research labs, and offices. An additional 190,000 assignable square feet of space is associated with study areas. Existing academic and research buildings are largely located within the core of campus, and reinforce general academic precincts including the agriculture quad to the south east, engineering and sciences to the west, and humanities and social sciences generally surrounding the amphitheater. The College of Business creates a new precinct to the north and further expands the campus across Walter T. Cox Boulevard.

As part of the Framework Plan, a space needs assessment was prepared to understand the amount of space needed to support a future student population of 26,300 headcount students (22,300 HC undergraduate students and 4,000 HC graduate students). In total, there is a future space deficit of approximately

715,000 assignable square feet across all space categories (excluding student housing), which translates into approximately 1.1 million gross square feet of space in the future, assuming a 65 percent efficiency. Included within this figure is ~220,000 gross square feet of academic space for classrooms, teaching labs, and offices; ~130,000 gross square feet of space for research; and ~240,000 gross square feet for library and study space. Future space deficits across categories are provided on the following table.

Space Category	asf	gsf
Academic	141,570	217,801
Research	86,031	132,355
Library / Study Space	154,178	237,197
Student Life Space	93,664	144,098
Recreation	213,200	328,000
Facilities / Support	24,924	38,344
Total	713,567	1,097,795

Opportunities

Development introduced in the Framework Plan options is designed to satisfy and accommodate the identified programmatic space need, as well as any square footage that gets displaced as a result of investment. While the space needs are identified for specific categories, how the needs are met can certainly begin to cross boundaries to create more dynamic, interconnected, and complex environments. Framework Planning also invites the opportunity to consider specific sites as optimal for future academic use versus alternate uses. From a building and land use perspective, while end users may not be identified, specific development sites may be ideal for particular Colleges or Departments based upon adjacency and synergy to proximate programs. Ultimately the Framework Plan should thoughtfully consider the creation of likeminded districts or academic precincts.

Relative to future academic buildings, plans for the Daniel Hall II will help to accommodate some of the identified academic need. Additional buildings may be required to fully satisfy that need. Relative to research, two key programs—Advanced Materials and Computer Science—are best suited for new structures in the future, and will help to satisfy the research need.

The amount of additional study space is significant, but accurate. Consultation with the librarians revealed a current shortage of roughly 2,000 seats. Additional enrollment growth and continued desirability of the library as not only a place to study, but also to socialize, will continue to exacerbate the shortage. The surface parking lot immediate to the east of the existing Cooper Library provides a logical location for future expansion. The library addition could be positioned as an active learning environment, designed specifically with collaborative and social learning in mind. It could include a wide spectrum of study spaces from active learning classrooms, to group study rooms, to digitally connected learning environments, thereby allowing the existing Cooper Library to return to its original function as a quiet library desired for primary scholarship.

In addition to accommodating study space needs in a centralized manner within the library, study space can also be accommodated in a distributed manner throughout academic and student life buildings as well. New and innovative types of spaces such as maker spaces and prototyping spaces should be incorporated throughout.

Constraints

Ideally instructional facilities should be as close to the campus core as possible. Limited land in the core of campus creates one of the most significant constraints to development. Funding, especially for buildings with multiple users, poses another hurdle, especially if State spending on higher education continues to decrease. Research buildings, can be located slightly beyond the core. As energy intensive buildings, they bring with them noise and more significant servicing requirements that need to be considered. The key challenge with providing study space, especially in a distributed model where it is included as part of a building, is that these types of spaces tend to get value engineered out of projects. Strong leadership, clear direction and vision around learning environments, and advocacy of study spaces as an integral part of the learning experience help to counteract some of these challenges.

The Way Forward

As the Framework Planning process moves forward, we will be testing a variety of ways to accommodate the overarching program requirements, and will be relying upon feedback from the Campus Planning Task Force and other constituencies to help define the preferred direction. In addition to meeting programmatic needs at a high level, there are also specific spaces where we as a team will drill into greater detail; one such area is in the addition to the Library.