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# Quantitative & Qualitative Analysis

## Introduction

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The following section summarizes the needs assessment conducted for East Carolina University during the Quantitative and Qualitative Analysis process (Task 3). These studies resulted in development of a Campus Space Program. A comprehensive list can be found in the Acknowledgements section of this report. This analysis was completed by the SmithGroupJJR team following accumulation of data that occurred in the Campus Overview process (Task 2).

The assessment is based upon systematic, organized evaluation of quantitative, qualitative, program-driven, and campus environment needs. It includes an evaluation of existing facilities for both condition and functional adequacy, and identifies facilities for replacement and re-purposing. The needs and costs identified for each project in the Campus Space Program were overlaid with the strategic goals of the University to develop a list of priorities. These findings steered the physical planning efforts, which are showcased in later chapters of this document.

Evaluation by the SmithGroupJJR team of ECU's existing conditions considered not only the institution's facilities and property, but also the University's relationship to the broader City of Greenville and eastern Carolina region. This enables a strategic alliance which will allow future growth and enhancement recommendations to provide a more enriching overall experience for East Carolina University and local communities.



# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Strategic Review

The Strategic Review was performed by Eva Klein and Associates during Task 3 of the Master Plan process.

### Introduction

Upon beginning the master planning process, East Carolina University expressed its desire to avoid development of a master plan with many unrealistic elements, either because they do not represent true needs or because they would be impossible to achieve in any kind of plan time horizon. Instead, ECU sought a master plan that could be implemented and also updated over time; the master plan would exist as a living document. It was for these reasons that a fifteen-year time horizon, to 2025, was selected for this Master Plan and serves as the strategic assumption in various analyses and projections. Current financial considerations may extend this fifteen-year timeline.

A Strategic Review was completed during the initial phase of the master planning process in order to achieve four important objectives:

1. Team Preparation (Establish for the entire SmithGroupJJR team

a comprehensive understanding of the institutional strategic framework for physical campus planning).

2. Priorities, Initiatives, Targets (Identify priorities and specific initiatives or targets that may affect directions for campus plans and capital priorities).
3. Campus Vision Physical Planning and Principles (Collect stakeholder ideas and aspirations for the campus vision and then express these as Planning Principles that guide the Campus Master Plan).
4. Strategic Framework Summary (Create a summary work paper to capture and summarize the above context for planning).

The following summary provides an overview of the findings compiled during the Strategic Review Process. For additional information, please refer to the *Strategic Framework for Comprehensive Master Plan*, dated February 2010 by Eva Klein & Associates.

### Enrollment Overview

In Fall 2010, of 27,783 students, undergraduates represented 78 percent and graduate students represented 23 percent. Based on current enrollment reports, distance education (DE) only students are nearing one-quarter of total enrollment. For the purposes of establishing a master planning baseline, one may assume that, currently, about 78 percent of students are face-to-face (F2F), or blended, while 22 percent of enrolled students are DE only.

ECU is a large and rapidly growing University. Trends of the last several years demonstrated growth in all cohorts. Growth has been averaging about 5 percent per year, from 2001 through 2008 and slowed to almost 0 percent (by design) for Fall 2009 and Fall 2010. The overall growth for the 2001-2010 period is 43 percent. Distance education enrollments have risen sharply, from 6 percent in 2001 to 22 percent in 2010. Beginning in 2006, the Health Sciences Campus

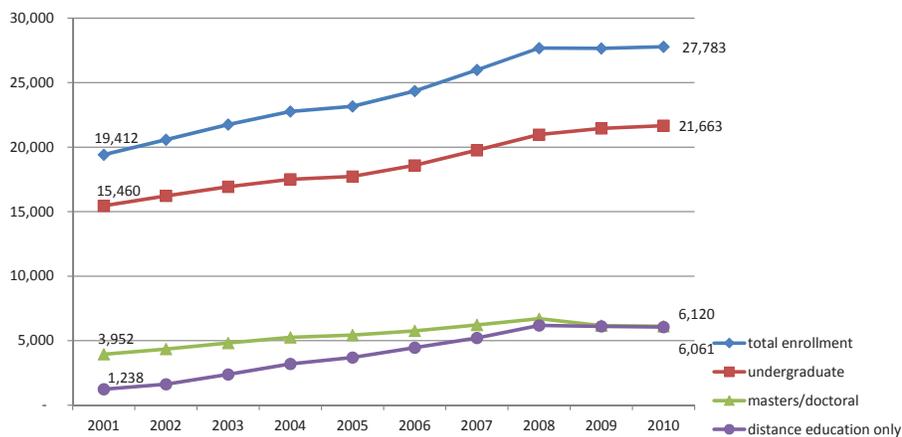


Figure 1 - Recent Enrollment Trends: 2001 through 2010

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has had an increasing student population, growing from 802 (4 percent) to 2,479 (9 percent) of ECU's total students. Despite this overall growth, the ratio of Full-Time Equivalent (FTE) students to headcount has been declining slightly in recent years.

At present, ECU has 5,491 undergraduate beds available in 15 buildings and another 265 in non-ECU owned fraternity housing. ECU does not have housing designed/designated for graduate students. For the future, the strategic assumption is that ECU wants to sustain its "residential" Carnegie designation. Thus, housing units will need to be increased in proportion with enrollment growth projected to 2025, assuming 25 percent minimum residential students.

When DE only students are not counted, in Fall 2010, about 24 percent of ECU students (about 5,300) are residential (with some taking both on campus and DE courses) and 76 percent (about 16,450) are commuters that come to the campus, although some also take both F2F and DE courses. In planning for transportation, circulation, and parking these statistics will serve as a baseline and will be adjusted to account for the overall projected enrollment increases.

### **Retention and Graduation**

One significant retention metric is the number (percent) of first-time, full-time freshmen who return

for their sophomore year. For the last five years, this measure has consistently hovered between 76 percent and 79 percent. In Fall 2009, there were 3,947 students in the first-time, full-time freshmen class. Of these, 81.2 percent were retained to Fall 2010. This rate is 0.2 percent more than the pre-established goal of 81 percent.

ECU's four-year graduation rates, both those graduating from and beginning at ECU and graduating from any institution that is a part of the Universities of North Carolina (UNC) system, have improved significantly from 2000 to 2006. They grew from 27.6 percent for students completing all four years at ECU and 32.7 percent for completion of a degree at ECU and another UNC institution to 28.8 percent and 33.9 percent, respectively. These completion rates are now nearing the all-UNC averages of 33.9 percent at a single institution and 36.7 percent at any combination of UNC institutions.

For the six-year graduation rate, ECU remains below the all-UNC figures. However, ECU is showing definite signs of closing the gap. The six-year graduation rate has not been improving on average for UNC system institutions.

### **Future Enrollment Projections**

East Carolina University's enrollment was projected to 2017 in an exercise done in 2007 for a ten-year period. These projections are re-visited for each new biennium with UNC

General Administration (UNC-GA). There is a new emphasis at the Board of Governors on retention and graduation elements of enrollment. The idea is that, once a strategy is adopted, UNC-GA would find a way to reward campuses for accomplishing improved retention and graduation. A major shift in enrollment growth funding calls for a fundamental shift in the way students are admitted, retained and graduated. While the enrollment growth projections will change, the precise results are unknown and are highly likely to be lower.

According to the 2017 enrollment projections, ECU currently represents 12 percent of UNC system-wide enrollment and its growth will change only slightly during this period, to 13 percent. However, ECU has been expecting a moderate increase, 7 percent growth in on-campus (F2F) enrollment and an aggressive increase in DE enrollments, at 7 percent and 33 percent of UNC total growth, respectively.

As ECU reconsiders its enrollment growth projections, given the current climate (slowing growth) and changing landscape in the UNC system, the data for ECU likely will change in terms of both undergraduate and graduate enrollment. DE enrollment is likely to continue to increase, given that ECU has the largest inventory in the UNC Online initiative. Refinements to the earlier enrollment projections to 2017 and their extension to 2025 may alter the ECU "share" data. In campus discussions and in

discussions with the ECU Board of Trustees, a proposal has been discussed that would slow the projected growth from the current projections for 2017 of 36,763 students to a more reasonable projection of 33,528 in 2017. An extension of this slower growth then would be extended through to 2025, the period established for this Master Plan. Projected in this manner, the total enrollment would be 38,717 in 2025. The greatest percentage change is expected to be in First Professional enrollments, growing by 277 percent. Graduate enrollment is also projected for strong growth, at 76.7 percent. Undergraduate total growth will be about 25 percent. Figure 2 highlights the projected distribution of Student Credit Hours (SCH) by delivery method. Based on this analysis, it is assumed that future instructional delivery will be distributed in two ways: 86 percent of all SCH will take place F2F/On-campus and 14 percent of all SCH will be through DE/Online courses.

### Enrollment Management Strategies

An ECU Strategic Enrollment Management Task Force (SEMETF) developed a Strategic Enrollment Management Plan in December 2008. In 2008-09, the University was involved in a strategic enrollment study process which focused almost exclusively on undergraduate enrollment, particularly on ways to increase admission criteria and retain and graduate more students. The Task Force identified the most critical issues facing the institution and built a series of recommendations to address those issues:

1. Defining and Embracing our Access Mission  
GOAL: To be the leader in providing a quality university experience to students who meet reasonable admissions expectations while ensuring that students are prepared to meet those standards and to succeed academically.
2. Improving Student Retention and Graduation  
GOAL: Increase student retention

and graduation rates.

3. Determining Effective Academic Program Mix  
GOAL: Strategically evaluate and re-evaluate the breadth and depth of our programs and degrees.
4. Providing Optimal Infrastructure  
GOAL: Rebuild a university infrastructure sufficient to meet the needs of students, faculty, and staff.

This Plan subsequently was accepted by ECU's Board of Trustees. These goals provided a general framework for which the master planning efforts were centered upon.

### Workforce Overview

In Fall 2010, East Carolina University employed 2,054 regular full-time and part-time faculty, and 3,633 full-time and part-time staff. Faculty represented over one-third of ECU's workforce. The average length of service for faculty was eight years. More than one-half (52 percent) of faculty members had fewer than six years of service, indicating that

Summary of Change in Total Student Credit Hours (SCH) by Undergraduate & Graduate: 2008 and 2025												
	Undergraduate				Graduate				Total			
	SCH Total by Method of Delivery				SCH Total by Method of Delivery				SCH Total by Method of Delivery			
	Campus	DE/	Missing	Total	Campus	DE/	Missing	Total	Campus	DE/	Missing	Total
<b>Fall 2008</b>												
Total (except Medical)	258,452	23,101	311	281,864	38,395	19,373	48	57,816	296,847	42,474	359	339,680
Medical									3,312		798	4,110
Total (including Medical)	258,452	23,101	311	281,864	38,395	19,373	48	57,816	300,159	42,474	1,157	343,790
% of Total SCH by Delivery Method	91.7%	8.2%	0.1%	100.0%	66.4%	33.5%	0.1%	100.0%	87.3%	12.4%	0.3%	100.0%
<b>Fall 2025</b>												
Total (except Medical)	332,886	29,754	401	363,041	68,535	34,581	86	103,202	401,421	64,335	486	466,242
Medical									9,661		2,328	11,989
Total (including Medical)	332,886	29,754	401	363,041	68,535	34,581	86	103,202	411,082	64,335	2,814	478,231
% of Total SCH by Delivery Method	91.7%	8.2%	0.1%	100.0%	66.4%	33.5%	0.1%	100.0%	86.0%	13.5%	0.6%	100.0%

Figure 2 - Distribution of Student Credit Hours

there has been considerable hiring in the last six years to replace retiring faculty and/or for new positions. ECU employs more women than men overall, with 61 percent women and 39 percent men. However, men outnumber women in the faculty category, 54 percent to 46 percent.

ECU tends to have a relatively high number/percentage of full-time faculty and staff, except for its many student workers. ECU's workforce has grown in total from 5,078 in 2006 to 5,687 in 2010, an increase of 12 percent. This matches enrollment growth for the period, which was 14 percent. Faculty-only growth for the period is higher, at 21 percent. Staff growth has occurred for Professional staff (38 percent) and Technical staff (50 percent). Decreases in staff levels have occurred in the Executive/Administrative (87 percent), Clerical (7 percent), Skilled Crafts (21 percent), and Service/Maintenance (8 percent) categories. Faculty and staff levels are subject to budgetary constraints and enrollment growth.

East Carolina University's faculty and staff workforce is predicted to continue to grow through 2025 to parallel increases in student enrollment. For example, faculty projections will likely have a strong relationship to the student ratio, as will student support employees in the non-faculty Exempt from the State Personnel Act (EPA) and Subject to the State Personnel Act (SPA) areas. The greatest variability will be around the size of the budget, facilities, and research activity in 2025.

### Land and Campuses

Overall, physical facilities and land assets owned by East Carolina University amount to approximately 1,500 acres and 211 buildings. This comprises nearly six million gross square feet of built space with a current replacement value (CRV) for buildings of nearly \$1.4 billion. These holdings are spread across four campuses: Main Campus, Health Sciences Campus, West Research Campus, and the North Recreational

Complex. The University also has control (via the State or Foundation) of another 11 acres of property.

In addition to its owned property and facilities, ECU currently leases nearly 200,000 SF of space in various facilities and locations in the City of Greenville and elsewhere. Some space is leased for reasons of shortages on campus and some is leased for strategic or service location reasons. The majority of leased space is clinical (142,551 SF), at least some of which is purposefully leased in certain non-campus locations.

### Space Distribution

Figures 3 and 4 show the distribution of East Carolina University's 4,000,000 NASF of campus space. It uses the standard Facilities Inventory and Classification Manual (FICM) Room Use Codes. Data is shown for the Main Campus and Health Sciences Campus, which differ considerably in their space type distribution.

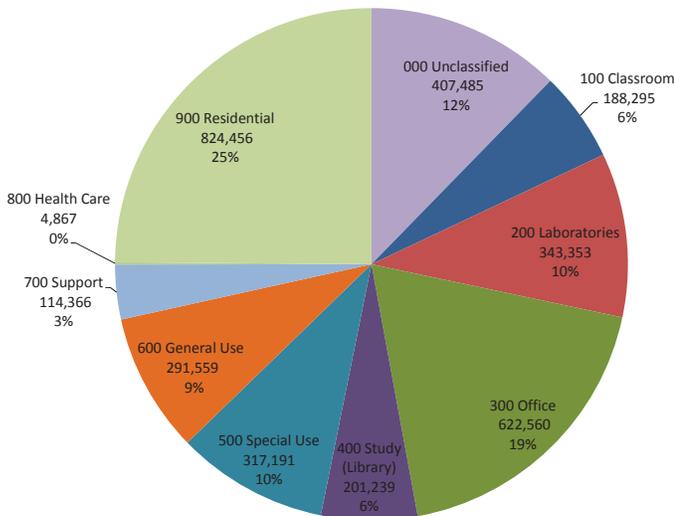


Figure 3 - Main Campus Space

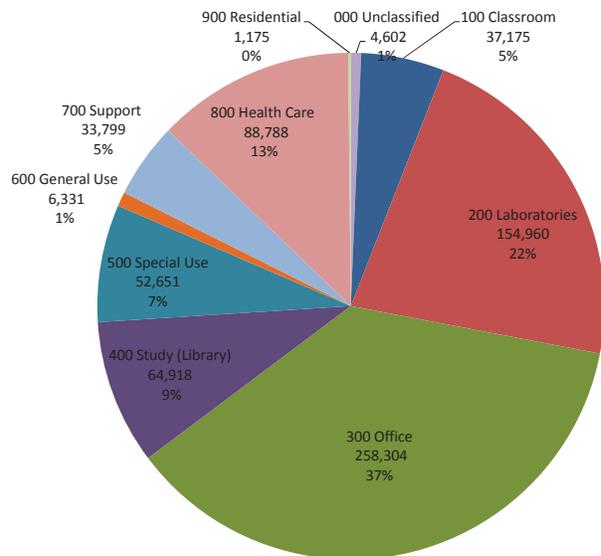


Figure 4 - Health Sciences Campus Space

ASF per student provides a rough measure of capacity. Main Campus has a total of 147 ASF per FTE, largely due to the presence of extensive research, laboratory, and clinical spaces; while Health Sciences Campus has a much larger ratio with 344 ASF per FTE. When comparing instructional space types, the distribution of space per student differs notably between the Main and Health Sciences Campuses, as is shown in Figure 5. For example, Main Campus has much less Classroom and Study space per FTE. Whereas, Health Sciences Campus has virtually no Residential space. The Main Campus has modest space per FTE for Healthcare uses (student health) and Health Sciences Campus has a considerable inventory of Healthcare (clinical) space. Overall, the Main Campus has much more General Use (student/campus life) space than Health Sciences Campus.

## ECU Tomorrow

Under the leadership of UNC President Erskine Bowles, the UNC Tomorrow Commission produced a strategic direction document for the University in December 2007. Constituent institutions developed responses in 2008. Implementation began in 2009.

ECU produced its phase 2 response to *UNC Tomorrow* in 2008. *ECU Tomorrow*, adopted by the ECU Board of Trustees in June 2007, pre-dates *UNC Tomorrow*, and is consistent with it. Since late 2008, various internal cross-walk documents that show the connections of *ECU*

*Tomorrow* with *UNC Tomorrow* and divisional strategic plans have been developed.

After discussion with Chancellor Ballard in late August 2009, the Office of Institutional Planning, Assessment, and Research is moving forward with assembling a campus-wide working group to provide draft language for an update to the strategic plan, *ECU Tomorrow: A Vision for Leadership and Service*. A current document is essential as ECU prepares for a 2013 reaffirmation of accreditation.

*ECU Tomorrow* outlined a strategic

direction for the University in five priority areas. These goals provided a framework for development of the Master Plan Principles that are outlined later in this report. *ECU Tomorrow's* most recent strategic plan goals are as follows:

1. Education for a New Century
  - ECU students will be prepared to compete in the Global Economy.
  - We are committed to student learning and success.
  - We will make ECU education accessible—increase college attendance, distance education, new programs.

Assignable Space (ASF) by FICM Room Use Codes per FTE Student for HSC and Main Campuses

		Room Use Codes	ASF	ASF/FTE	% of Total
ECU--Main Campus	100	Classroom	188,295	8.4	5.7%
	200	Laboratory	343,353	15.3	10.4%
	300	Office	622,560	27.7	18.8%
	400	Study	201,239	8.9	6.1%
	500	Special Use	317,191	14.1	9.6%
	600	General Use	291,559	13.0	8.8%
	700	Support	114,366	5.1	3.4%
	800	Health Care	4,867	0.2	0.1%
	900	Residential	824,456	36.7	24.9%
	000	Unclassified	407,485	18.1	12.3%
<b>Totals--East Campus</b>			<b>3,315,371</b>	<b>147.4</b>	<b>100.0%</b>
ECU--West Campus (Health Sciences)	100	Classroom	37,175	18.2	5.3%
	200	Laboratory	154,690	75.7	22.0%
	300	Office	258,304	126.4	36.8%
	400	Study	64,918	31.8	9.2%
	500	Special Use	52,651	25.8	7.5%
	600	General Use	6,331	3.1	0.9%
	700	Support	33,799	16.5	4.8%
	800	Health Care	88,788	43.4	12.6%
	900	Residential	1,175	0.6	0.2%
	000	Unclassified	4,602	2.3	0.7%
<b>Totals--West Campus</b>			<b>702,433</b>	<b>343.7</b>	<b>100.0%</b>

Source: UNC Facilities Inventory and Utilization Study 2008

Figure 5 - Space Per Student

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2. The Leadership University
    - Center for Transformational Leadership.
    - BB&T Leadership Center—service learning and leadership components in the curriculum.
    - Chancellor’s Leadership Academy—staff and faculty leaders.
    - Center for Student Success—ensure graduates have demonstrated leadership competency.

- School of Dental Medicine; Family Medicine Center).
- Expand research in Health Sciences.
- Extend the reach of the Brody School of Medicine.

3. Economic Prosperity in the East
  - Academic programs that provide individuals skills and tools to compete in 21st century workplace.
  - Improve access for communities and individuals to University resources.
  - Support continued development of competitive workforce for North Carolina.
  - Support entrepreneurial mindset throughout the University.
  - Strengthen partnerships with business, elected officials, and economic developers.
  - Increase investment in innovation and research.

5. The Arts, Culture, and the Quality of Life
  - Build a world-class center for visual and performing arts.
  - Enhance Greenville’s standing as an arts and cultural community.
  - Be the catalyst for a true renaissance of downtown Greenville.
  - Strengthen the athletics program.

The master planning process that is outlined in this report utilized the information and goals established during the Strategic Review process, as summarized above, to develop the framework for a comprehensive Master Plan for East Carolina University.

4. Healthcare and Medical Innovation
  - Expand Brody School of Medicine class size.
  - Add up to five new medical specialties.
  - Extend clinical services to every county in the region.
  - Expand/improve healthcare facilities (Heart Institute;

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Facilities Condition

The Facilities Condition Analysis was performed by ISES Corporation during Task 3 of the Master Plan process.

### Introduction

As part of the Strategic Review, a Facility Condition Assessment (FCA) was completed for East Carolina University that inspected 67 campus buildings, totaling nearly four million square feet and including various higher education use types. As part of this process, a Facility Conditions Need Index (FCNI) was utilized to provide a relative measure for comparing one building (or group of buildings) to another. The index is a simple calculation, derived by dividing total project costs by the total Facility Replacement Cost (FRC). When applying the index as an evaluation tool, the lower the number, the better the facility condition. It should also be noted that this is an index, not a percentage. It can (and often does in the case of historic facilities) exceed 1.00.

The FRC represents the cost to replace an existing building with one of similar use type and size on the same site. This includes demolition, site preparation, professional fees, and construction costs. The client is given the option to develop their own FRCs or have the consultant develop those costs for them. For this FCA effort, ECU opted to have their consultant develop the FRCs based on 2009 R.S. Means construction cost data.

There are two main methods of applying the FCNI in analyzing the data derived from a FCA. The first method involves looking at individual facilities. When applying it to a single facility, the lower the FCNI,



the better. In terms of assessing where a facility falls within a range of conditions, the standards indicated in Figure 6 can be applied. The second method for utilizing the FCNI is by comparing groups of facilities to other groupings. Comparisons in this vein do not yield hard data, but rather form the basis of analysis for comparing the overall state of facilities to another comparable grouping.

### EXISTING BUILDING CONDITION (FCNI Ranges)

	0.01-0.05: Excellent, typically new construction
	0.06-0.15: Good, renovations occur on schedule
	0.16-0.30: Fair, in need of normal renovation
	0.31-0.40: Below average, major renovation required
	0.41-0.59: Poor, total renovation indicated
	0.60 and above: Complete replacement needed
	Not evaluated



## Analysis of Overall Conditions

The FCA for ECU culminated in a database of deficiencies that need to be addressed over the next ten to fifteen years. For the 67 buildings evaluated in the study, \$347 million in project recommendations were identified for the next ten years. When compared to the \$1.259 billion replacement value for the facilities in the study, the subsequent FCNI equals 0.28. This FCNI figure is only slightly higher than the 0.26 median FCNI typically identified. This indicates that these buildings are in just slightly worse than average condition. However, considering the weighted average age of forty years for the portfolio analyzed, the FCNI is to be expected. For a complete analysis, it is necessary to look at individual components and

classifications and then compare them to the norm. The first area for standard analysis is reviewing the project backlog distribution across the various building systems. Figure 7 summarizes this information and provides an historical average for comparison purposes.

The median for mechanical, electrical, and plumbing (MEP) systems is about 52 percent of total backlog. MEP systems account for 56.5 percent of total deficiencies in the East Carolina University database. This deviation from the norm is partly attributable to the fact that the portfolio of facilities inspected was slightly older than the norm. It was observed that, although competently maintained, the HVAC systems are generally aged and neglected

with regards to capital investment. Exterior envelope and Interior Finish categories for ECU are equal to the norm at 30 percent of the total backlog.

## Distribution of Project Costs

A key component of the FCA was understanding the distribution of project costs across the three project classifications. The three project classifications utilized are as follows:

### Plant / Program Adaptation

1. Expenditures required to adapt the physical plant to changing codes or standards.
2. Expenditures beyond normal maintenance. Examples include compliance with changing codes (e.g. accessibility).

Individual Building FCNI Range	Condition Description
0.01 - 0.05	Excellent condition, typically new construction
0.06 - 0.15	Good condition, renovations occur on schedule
0.16 - 0.30	Fair condition, in need of normal renovation
0.31 - 0.40	Below average condition, major renovation required
0.41 - 0.59	Poor condition, total renovation indicated
0.60 and above	Complete facility replacement indicated

**Figure 6 - Facility Conditions Need Index**

Note: The above ranges represent averages based upon the consultant's experience extending over 8,500 facilities and one billion gross square feet, plus associated infrastructure evaluations. The reader is cautioned to examine each facility independently for mitigating factors, (i.e. historic structures, temporary structures, facilities with abnormally low replacement costs such as warehouses, etc.)

**Deferred Maintenance**

1. Refers to expenditures for repairs which were not accomplished as a part of normal maintenance or capital repair that have accumulated to the point that facility deterioration is evident and could impair the proper functioning of the facility.
2. Costs estimated for deferred maintenance projects should include compliance with applicable codes, even if such compliance requires expenditures beyond those essential to affect the needed repairs.
3. Deferred maintenance projects represent catch up expenses.

**Capital Renewal**

1. Subset of regular or normal facility maintenance which refers to major repairs or the

replacement / rebuilding of major facility components (e.g., roof replacement at the end of repair).

Figure 8 shows the results for ECU compared to a base average. It demonstrates that 12.4 percent of the project backlog falls within the Plant / Program Adaptation Projects classification. Consisting mostly of fire / life safety and accessibility upgrades, East Carolina University ranks better than the historical average in this project classification.

The proportion of Capital Renewal projects to Deferred Maintenance projects at ECU is essentially the reverse of what is typically identified. This shift, from Capital Renewal to Deferred Maintenance, has emerged as a trend over the past five to ten years. A higher education

construction boom in the late 1960s and early 1970s contributes to an average 38 year facility age. As costly systems with 30 to 50 year life cycles started to fail in recent years, deficiencies that were considered Capital Renewal five to ten years ago are now considered Deferred Maintenance.

Finally, Figure 9 provides a comparison of how backlog falls within the four priority classes, based on completion timelines. For the ECU campus, Priorities 1 and 2 account for only 9 percent of the total backlog compared to the 22 percent Historical Average. This shift can be attributed to renovation efforts in over 10 percent of the facilities portfolio in the late 1990s and early 2000s. Priorities 3 and 4 account for 91 percent of total backlog, with 73

	AC	EL	ES	FS	HE	HV	IS	PL	SI	VT
East Carolina University	4.0%	13.3%	11.0%	8.1%	0.6%	34.8%	18.6%	8.4%	0.6%	0.6%
ISES Historical Average	5.9%	14.8%	11.8%	8.1%	1.3%	29.5%	18.2%	7.4%	2.1%	0.9%

**Figure 7 - Project Backlog Distribution Comparison**

Note: AC-Handicapped Accessibility, EL-Electrical, ES-Exterior Structure, FS-Fire/Life Safety, HE-Health, HV-HVAC, IS- Interior Finishes / Systems, PL-Plumbing, SI-Site, VT-Vertical Transportation

percent of that amount being due in years two through five. The high percentage of deficiencies in priority class three indicates that facilities conditions can rapidly deteriorate if adequate funding for systems renewal is not secured.

### Conclusion

The information presented in this summary, supported by the graphs and charts, illustrate that the overall conditions for East Carolina University's occupied facilities are only 8 percent worse than the norm found from the consultant's past FCA clients. East Carolina University's FCNI currently lies in the 58th percentile of the consultant's historical client data. While the ECU

campus was found to be average, the 40 year age of the University's facilities portfolio is such that overall conditions are set to deteriorate rapidly as major building systems exceed their useful service lives.

Applying the FCNI projection capabilities of the database to the backlog, the model predicts that the status quo FCNI of 0.28 can be maintained by reinvesting at the rate of 1.84 percent of current plant value (\$23.2 million annually). If the future reinvestment rate is lower than 1.84 percent of plant value, the FCNI will gradually increase (deteriorate) over the next 15 years. For example, a 1 percent reinvestment rate (\$12.6 million annually) will cause the FCNI to increase (deteriorate) to 0.344 at

the end of ten years. Reinvestment at the rate of 2 percent of plant value (\$25.2 million annually) will cause the FCNI to decrease (improve) to 0.263 at the end of ten years. Many different scenarios can be played out in the financial model feature of the database software.

The Life Cycle Model projection shown in Figure 10 demonstrates an average annual renewal cost per square foot for these East Carolina University facilities of \$5.04. This figure is derived by estimating the cost to replace all major systems/ components of the buildings as they reach the end of their estimated life spans over a fifty-year period. When the annual average of \$5.04 per gross square foot is applied to the

	Plant / Program Adaption	Deferred Maintenance	Capital Renewal
East Carolina University	12.4%	54.0%	33.6%
ISES Historical Average	20.3%	28.4%	51.3%

**Figure 8** - Distribution of Project Costs

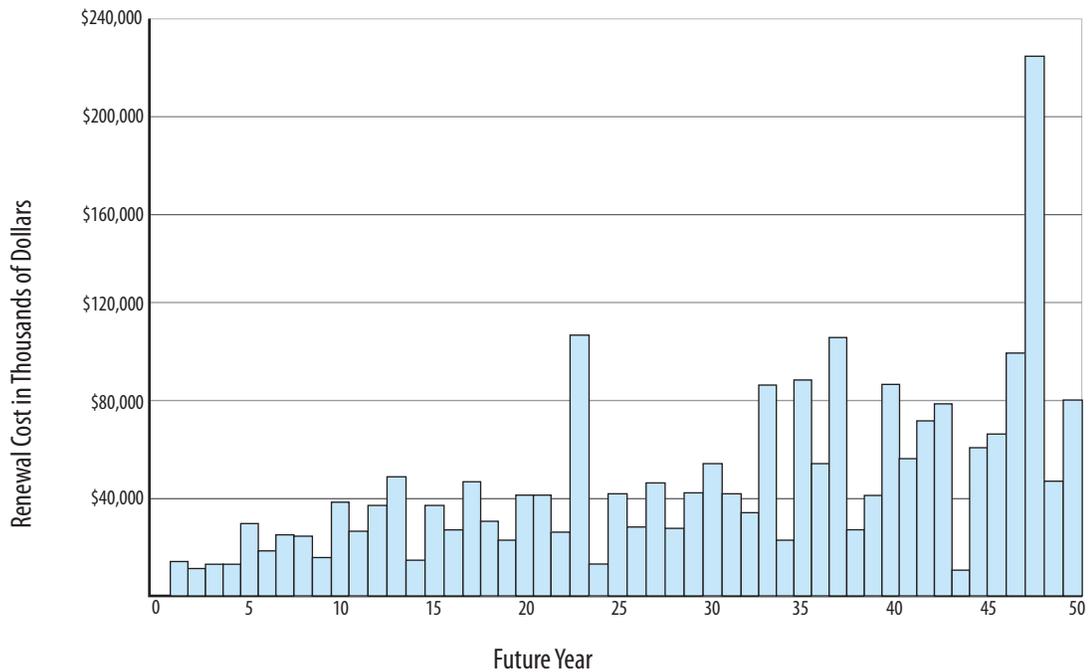
	Priority 1 and 2 (Year 1)	Priority 3 (Years 2-5)	Priority 4 (Years 6-15)
East Carolina University	9%	73%	18%
ISES Historical Average	22%	57%	19%

**Figure 9** - Priority Class Comparison

entire group of facilities inspected, it results in an annual Capital Renewal funding requirement of \$19.9 million. This figure is less than the aforementioned “status quo” annual reinvestment rate because the Life Cycle Model does not take plant adaptation into account. Still, the number is on par with the annual reinvestment rate required to keep the overall condition of facilities from deteriorating.

program-related grant funding, which provides for space renewal, etc.). This figure also would include any funding for new construction provided that the new construction is utilized to replace existing deteriorated structures. If new structures are built but the older facilities are kept in service, the problem will be exacerbated.

When attempting to plan for the annual investment required to meet the desired goal, keep in mind that the annual investments discussed above represent funding from all sources (annual Deferred Maintenance and Capital Renewal funding, major renovation funding,



**Figure 10** - Life Cycle Model Expenditure Projections

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# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Facilities Functionality

The Facilities Functionality Assessment was performed by Eva Klein and Associates during Task 3 of the Master Plan process.

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### Methodology

The Functionality Assessment methodology was initially created for the comprehensive capital needs assessment that East Carolina University's spatial planning consultant performed in 1999-2000 for the Board of Governors of the University of North Carolina. It is a methodology that adds another qualitative evaluation dimension to the traditional Facilities Condition Audit which addresses existing deficiencies and expected renewal needs of the buildings, as physical building systems and subsystems. The Facilities Condition Audit is an engineering-based evaluation, whereas the spatial planning consultant's Functionality Assessment is a strategic/program-based evaluation, which seeks to answer the following questions:

1. How well does the existing facility (space) meet contemporary and future functionality needs for the program(s) it is supposed to serve? or
2. What are the requirements to upgrade and modernize the facility (space) to be plausibly equivalent to the functionality of a new facility of the same type, if built today?

A key difference between the Functionality Assessment and the Facilities Condition Audit is that the Functionality Assessment is organized and conducted by space types (e.g., classrooms, teaching or research laboratories, offices, etc.), rather than by building subsystems. Also, it is a two-part methodology:

1. Field Evaluations of buildings based on pre-established Space Functionality Criteria that express functional performance features of space, by space types.
2. Information about functionality and program needs obtained in User Group Interviews.

Figure 11 shows the ECU buildings that were included in this Functionality Assessment, sorted by campus/location, and including notes regarding the evaluation activities that were undertaken for each building. In some cases, buildings were added for the purpose of interviews with users that were not evaluated in walk-throughs. Also, a few buildings that the spatial planning consultant evaluated were not included in the FCA.

### Findings

The Functionality Assessment findings were provided in individual Building Reports for each building included in the analysis. Because the findings are specific to each building, they cannot be summarized. Interested readers should refer to the individual *Building Reports*. The information that follows here is a description of the structure/content of those reports.

### Overall Building Report Content

In these building-specific deliverables, the primary report page is called the Functionality Assessment Summary - By Building. Where applicable, the *Building Reports* also include the following back-up worksheets:

1. Facility Condition Analysis, Detailed Project Summary by Category/System Code, ISES, April 2010.
2. Facility Condition Analysis, Detailed Project Summary, Project Class by Priority Class, ISES, April 2010.
3. User Group Interviewees, EKA, March 2010.
4. Building Functionality Assessment - Cost Estimates (to correct functionality deficiencies or to "modernize"), provided by Stewart Mulford, Mulford Associates, May 2010.

### Details of Assessment

The summary (primary report page) for each building is organized into seven sections:

1. General Information (building code, building name, Gross Square Feet (GSF), Net Assignable Square Feet (NASF), Current Replacement Value (CRV), year built, date and cost of major renovations, comments on type of structure, departments/users, location description and user comments on location).
2. Functionality Findings (building walk-through, summary of walk-through observations).
3. Functionality Findings (user group interviews, summary of interview comments).
4. Functionality Findings (corrections/changes required from #2 and #3 above, SmithGroupJJR team's comments/conclusions based on the combination of walk-throughs and interviews).

5. Findings (condition deficiencies, very brief summary of condition findings and cost estimate for corrections for those buildings evaluated in FCA).
6. ECU Capital Project Defined in 2009-2011 Capital Plan/Request (Where applicable, projects that were listed in the ECU 2009-2011 capital request are shown, with their estimated costs as shown in the Capital Request).
7. Proposed Project / Solution for Building, from #1 through #6 above (In this final section, the proposed modernization project, including changes of use, where these were developed, are provided).

Then, the findings of this Functionality Assessment were evaluated with findings from the Space Capacity Analysis (SCA) (quantified space needs) and other needs assessment work by consultants. A preliminary version of capital projects was defined for existing buildings, for inclusion in the Capital Projects Plan.

The work associated with the Functionality Assessment and its integration into Capital Projects ended in May 2010. The conclusions in this Functionality Assessment and the resulting *Building Reports* input were made prior to the physical planning effort, and adjustments may have been made during that process.

**Figure 11 - Building Functionality Assessment**

Building Functionality Assessment - Building List Sorted by Walk-Throughs, User Group Interviews, Functionality Cost Estimates, ISES Condition Audit, and Team Project Discussions							
Campus/ Location	Bldg Code	Building Name	Building Walk-Through (EKA/ SG)	Interviews with Building User Groups (EKA)	Cost Estimate to Modernize (Correct Functionality Deficiencies) (Mulford)	Condition Audit (ISES)	Project Edited in Team Discussions (May 2010) (ECU+ SG Team)
Hlth Sci	BIOT	BIO TECHNOLOGY BUILDING	X	X	X	X	X
Hlth Sci	BROD	BRODY MEDICAL SCIENCES BUILDING	X	X	X	X	X
Hlth Sci	LJCC	LEO JENKINS CANCER CENTER	X	X	X	X	X
Hlth Sci	LIFE	LIFES SCIENCES BUILDING	X	X	X	X	
Hlth Sci	UTIL	MEDICAL HEATING FACILITY	X	X	X	X	X
Hlth Sci	MEDP	MEDICAL PAVILIONS 1-10 (except Pavilion 8)	X	X	X	X	
Hlth Sci	PHQC	PHYSICIANS QUAD C	X	X	X	X	
Hlth Sci	PHQM	PHYSICIANS QUAD M	X	X	X	X	
Hlth Sci	PHQN	PHYSICIANS QUAD N	X	X	X	X	
Main	AUST	AUSTIN BUILDING	X	X	X	X	
Main	BELK	BELK BUILDING & BELK ANNEX		X			
Main	CHRI	CHRISTENBURY MEMORIAL GYM	X	X			
Main	ELLE	ELLER HOUSE		X			
Main	ERWI	ERVIN HALL	X	X	X	X	
Main	FLAN	FLANAGAN BUILDING		X			X
Main	FMUS	FLETCHER MUSIC CENTER	X	X	X	X	
Main	GRAH	GRAHAM BUILDING	X	X	X	X	X
Main	BATE	HAROLD H. BATE BUILDING	X	X	X	X	X
Main	HO WE	HO WELL SCIENCE BUILDING	X	X	X	X	
Main	HUMA	HUMAN RESOURCES	X	X	X	X	
Main	JENK	JENKINS FINE ARTS	X	X	X	X	X
Main	JO YE	JO YNER EAST	X	X	X	X	X
Main	JO YN	JO YNER LIBRARY & JO YNER DRUM ADDITION	X	X	X	X	
Main	B043	MAIL SERVICES / WAREHOUSE / TECH LAB A	X	X	X	X	
Main	MCSS	MCGINNIS SCENE SHOP	X	X		X	
Main	MCGI	MCGINNIS THEATER	X	X		X	
Main	MESS	MESSICK THEATRE ARTS	X	X	X	X	
Main	RAGS	RAGSDALE HALL	X	X	X	X	
Main	RAWL	RAWL BUILDING	X	X	X	X	
Main	RVE/ RVE2	RIVERS BUILDING & RIVERS ADDITION	X	X	X	X	
Main	SCIE	SCIENCE & TECHNOLOGY BUILDING		X			
Main	SPEI	SPEIGHT BUILDING	X	X	X	X	
Main	SPIL	SPLMAN BUILDING	X	X	X	X	
Main	FSSP	STEAM PLANT 14TH STREET	X	X	X	X	X
Main	WHIC	WHICHARD BUILDING	X	X	X	X	
Main	WRA	WRIGHT ANNEX	X	X	X	X	
Main	WRIG	WRIGHT AUDITORIUM	X	X	X	X	
City/ Other	GCTR	GREENVILLE CENTRE	X	X		X	X
City/ Other	HARS	HARRIS BUILDING	X	X		X	
City/ Other	WRAB	WEST ACADEMIC BUILDING	X	X	X	X	
City/ Other	WILS	WILLIS BUILDING	X	X		X	
South/ Athl	FITT	FITT BUILDING		X			X
South/ Athl	MING	MINNESOTA MUSEUM		X	X	X	X
South/ Athl	STRE	STRENGTH CENTER (no interviewees in group)		X			
South/ Athl	WARD	WARD SPORTS MEDICINE	X	X	X	X	

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Facilities Space Capacity

The Facilities Space Capacity Assessment was performed by Eva Klein and Associates during Task 3 of the Master Plan process.

### Methodology

SCA methodology is designed to answer the question: Based on space guidelines applied to current and projected use/user metrics, how much space of certain types does ECU require by the end of the Master Plan's fifteen-year time horizon?

### Space Types Included

The assignment included Classrooms, Class Laboratories, Open Laboratories, Research Laboratories, Study (Library and non-Library), Office Facilities, and Support Services Facilities. Other SmithGroupJJR team members addressed needs in Special Use, General Use, Clinical, and Residential space types. The SCA was based on Room Use Codes and definitions provided in the standard federal classifications for higher education facilities. Space types and sub-types covered in the spatial planning consultant's SCA and those covered by other team members are shown in Figure 12 at the right.

### Policy Inputs

The following policy elements underlie the SCA:

1. Space planning standards or guidelines (expressed as space allowances)—in this case, space planning standards policy of UNC, modified/updated by the spatial planning consultant for this ECU analysis.
2. Utilization targets for Classroom and Class Laboratory space, also drawn from UNC policy and modified/updated for ECU by the spatial planning consultant.

3. ECU Space Policy (final version provided to spatial planning consultant in March 2010).

### Data Inputs

The following Fall 2009 data and projection assumptions were provided by ECU:

1. Current Space (ECU's Space Inventory of Assignable Square Feet (ASF) of existing campus space, coded by Room Use Codes and by discipline codes where applicable, and with square footage, for each space type assessed).
2. Current Use/Users (Use counts including Student FTEs, Student Contact Hours of Instruction (by discipline), Faculty and Staff FTEs, library volume counts, and three-year average research expenditures (for research requiring laboratory space). For Health Sciences, Dental Medicine enrollments and the new School of Dental Medicine space were excluded from the analysis).
3. Projected Use/Users (The same metrics that were applied to current use also were projected to 2025, the fifteen-year time horizon of the Master Plan—all based on growth assumptions supplied by ECU. These included enrollment projections converted to Student Contact Hours of Instruction; projections of faculty and staff growth; projections of growth in library collections; and projected growth in research. The spatial planning consultant worked with many ECU personnel to obtain, refine, and correct the 2009 baseline use/user data

Figure 12 - Room Use Classification

<u>Room Use Classifications and Codes</u> <u>Used in EKA's ECU Space Capacity</u> <u>Analysis</u>	
100	Classroom Facilities
110	Classroom
115	Classroom Service
200	Laboratory Facilities
210	Class Laboratories
215	Class Laboratories Service
220	Open Laboratory
225	Open Laboratory Service
250	Research/Non-Class Laboratory
255	Research/Non-Class Laboratory Service
300	Office Facilities
310	Office
315	Office Service
350	Conference Room
355	Conference Room Service
400	Study Facilities
410	Study Room
420	Stack
430	Open-Stack Study Room
440	Processing Room
455	Study Service
700	Support Services
710	Central Computer or Telecommunications
715	Central Computer or Telecommunications Service
720	Shop
725	Shop Service
730	Central Storage
735	Central Storage Service
740	Vehicle Storage
745	Vehicle Storage Service
750	Central Service
755	Central Service Support
760	Hazardous Materials Storage
770	Hazardous Waste Storage
775	Hazardous Waste Storage Service
780	Unit Storage
<u>Room Use Classifications and Codes</u> <u>Covered by Other Master Plan Team</u> <u>Firms</u> (main series numbers only)	
500	Special Use Facilities (includes Athletics and other)
600	General Use Facilities (includes most student activities/services space)
800	Health Care Facilities (includes clinical facilities)
900	Residential Facilities (includes student housing)

Note: Based upon *Postsecondary Education Facilities Inventory and Classification Manual (FICM)*, 2006 Edition

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and to refine and test growth assumptions, through several iterations of the SCA calculations).

## Findings

The SCA findings were provided separately for the Main Campus and for the Health Sciences Campus, with the exception of 700-Support Service Facilities—for which a single ECU-wide calculation was provided.

### Surplus / Deficits in 2009

For Main Campus, surpluses of space in 2009 for Classrooms, Class Laboratories, Research Laboratories, and Office Facilities were found. For the Health Sciences Campus, surpluses in 2009 were found for all space types except Open Laboratories. Instructional space surpluses (100 and 200 Room Use Codes) typically result in cases where utilization is below target standards (for either or both Weekly Room Use Hours and Station Occupancy Ratio). This is usually a consequence of scheduling policy and practices.

ECU was surprised by the finding of a sizeable Office Facilities surplus, as there is a strong impression that offices are in short supply. Both may be true. If offices are incorrectly located, too large, or temporarily vacant, these factors can result in a calculated NASF surplus, while the actual number of discreet office available for assignment (in desired buildings) may be in short supply. Building renovations provide an opportunity to right-size and reallocate offices. However, this

strategy is a long-term solution and subject to obtaining sufficient capital funding.

Open Laboratories (220) are a difficult space type to assess, given modern instructional technology. These rooms are defined as specially-equipped, discipline-specific “lab”-type rooms, primarily used for drop-in study (not for scheduled instruction). Music practice rooms and art studios are the classic examples, but other types exist. With changing instructional technologies, for example, simulation software, it has become harder to correctly code 220 Open Laboratories vs. 410 Study Space. Informal use of science laboratories coded as instruction labs (210) also is a factor.

Most of the 400 series Study Facilities deficit on Main Campus is attributable to deficits of 420/430 Stack/Collection space, not 410 Study Space. But, it is possible that the findings point to a shortage of individual study/lab areas on the Main Campus.

Overall, in 2009, ECU’s Main Campus had 171,000 more NASF than requirements projected by the model, with some maldistribution of space by types. The Health Sciences Campus had a surplus of 123,000 NASF of space. Overall, ECU had a 2009 space surplus of about 325,000 NASF—that growth will absorb. These model-generated surpluses also present an opportunity; as older buildings are renovated, spaces can be re-purposed and re-sized, with the end result being a better distribution

of space types; more efficient use of space; and modern, functionally-correct space.

### Total Surpluses / Deficits Project for 2025

By 2025, based on projected growth factors and assuming a hypothetically constant Space Inventory, there will be accumulated deficits—in varying degrees—in all space types on the Main Campus. Even the significant calculated surplus of Office Facilities in 2009 turns into a deficit by 2025.

The single largest projected deficit, in Study Facilities, is driven mostly by the University Librarian’s projected growth in collections. Based on this SCA, solutions for off-site volume storage seemed appropriate to consider, so that more of the Main Campus library space can be devoted to library services and study areas.

Even with its projected growth, the Health Sciences Campus will still have (reduced) surpluses in Classrooms, Class Laboratories, and Study Facilities. However, this Campus is projected to have a significant shortage of Research Laboratories and a fairly significant shortage of Office Facilities.

### Campus-Wide Space Findings

In this SCA, General Classrooms and Study Facilities were treated as campus-wide space types—meaning that these rooms should be available to all departments on Main Campus or to all departments on the Health Sciences Campus. Support Facilities were calculated on an ECU-wide basis, without regard to campus.

Figure 13 provides the Space Capacity Summary for the three campus-wide space types. It shows both the 2009 Space Inventory, space required and surplus (deficit) for 2009, and space required and surplus (deficit) projected for 2025.

### Departmental Space Findings

The four other categories of space, including Class Laboratories, Open Laboratories, Research Laboratories, and Office Facilities, were considered departmental space. Disaggregation by departments/disciplines was provided for those space types where there are uniquely outfitted rooms—e.g. Class Laboratories, Open Laboratories, and Research Laboratories—but not for Office Facilities, which, by the character of the space, should be largely interchangeable in use. (The location of offices is a building functionality

issue, and is not analyzed by means of the SCA methodology.)

For departmental space, the summary below shows the 2009 Space Inventory data; the projected requirements for 2025; and the projected surplus (deficit) for 2025 only. The current or 2009 surpluses (deficits) are not shown. Departmental surpluses and deficits were subsequently factors in considering how existing facilities could be re-purposed to better match growing departmental needs projected for 2025.

### Integration with Other Findings

The SCA analysis is quantitative only; it does not address location, condition, or quality/suitability of available space. Thus, the best use of SCA findings is in concert with qualitative requirements for modernization of existing buildings.

This leads to solutions and a Capital Projects Plan that includes reconfiguration, right-sizing, and re-location of various departmental and campus-wide space. Accordingly, the intent for this SCA was to yield findings that would be integrated with (1) qualitative findings about the condition, functionality, and current uses of existing buildings (ISES and EKA) and (2) special purpose facilities needs, i.e., program-driven needs developed by SmithGroupJJR and other firms in the team. Collectively, the analyses led to identification of capital projects including (1) new program-driven facility requirements; (2) new facilities required for growth/expansion; (3) modernization of existing buildings, including comprehensive renovations and reconfiguration and use changes; and (4) new infrastructure.

**Figure 13** - Summary of Surpluses (Deficits): 2009 and 2025

Room Use Code	Space Category	Main Campus Surpluses (Deficits)		Health Sciences Campus Surpluses (Deficits)		Total ECU Surpluses (Deficits)	
		2009	2025	2009	2025	2009	2025
110/115	Classrooms	33,629	(13,528)	25,995	25,995	59,624	12,467
210/215	Class Laboratories	12,992	(39,178)	22,574	18,752	35,567	(20,426)
220/225	Open Laboratories	(8,404)	(32,351)	(9,289)	(14,844)	(17,693)	(47,195)
250/255	Research Laboratories	36,683	(56,810)	45,090	(108,313)	81,773	(165,123)
300	Office Facilities	124,221	(17,658)	962	(52,580)	125,182	(70,238)
400	Study Facilities-Libraries	(26,784)	(99,035)	18,492	7,941	(8,293)	(91,093)
400	Study Facilities-Elsewhere-Main Campus	(1,501)	(8,756)			(1,501)	(8,756)
400	All 400	(28,285)	(107,791)	18,492	7,941	(9,793)	(99,850)
	Total--100 to 400	170,835	(267,316)	103,824	(123,048)	274,660	(390,364)
700	Support Service Facilities					50,895	3,327
	Totals	170,835	(267,316)	103,824	(123,048)	325,555	(387,037)

**Figure 14 - Summary of Current Inventory and Space Requirements with Surpluses (Deficits) in 2025**

East Carolina University												
Space Capacity Analysis												
SUMMARY OF CURRENT INVENTORY AND SPACE REQUIREMENTS WITH SURPLUSES (DEFICITS) IN 2025												
College/Department Space: 210-Class Labs; 220-Open Labs; 250-Research Labs; and 300-Office												
	Class Lab (210/215)			Open Lab (220/225)			Research Lab (250/255)			Office Facilities (300 Series)		
	2009 Inventory	2025 Space Required	2025 Surplus / Deficit	2009 Inventory	2025 Space Required	2025 Surplus / Deficit	2009 Inventory	2025 Space Required	2025 Surplus / Deficit	2009 Inventory	2025 Space Required	2025 Surplus / Deficit
<b>MAIN CAMPUS</b>												
Arts and Sciences (Harriot)										119,622	127,175	(7,553)
Biology	40,918	61,684	(20,766)	1,989	17,856	(15,867)	20,058	22,940	(2,882)			
Chemistry	24,870	31,019	(6,149)	2,251	10,853	(8,602)	14,491	8,205	6,286			
Geological Sciences	4,141	10,694	(6,553)	627	1,807	(1,180)	11,294	15,080	(3,786)			
Physics	3,439	8,805	(5,366)	1,598	1,501	97	8,931		8,931			
Anthropology	2,786	1,487	1,299	347	1,216	(869)	2,203	6,378	(4,175)			
Psychology	1,826	3,052	(1,226)	1,051	797	254	2,506	218	2,288			
All Other Arts and Sciences	7,212	8,930	(1,718)	10,753	3,147	7,606	1,877	1,794	83			
Business	936	0	936	1,679	408	1,271	0	2,129	(2,129)	24,430	37,134	(12,704)
Education	10,216	9,043	1,173	2,343	4,458	(2,115)	0	1,684	(1,684)	48,069	46,669	1,400
Fine Arts & Communication	50,585	52,359	(1,774)	35,558	44,176	(8,618)	0	59,626	(59,626)	0	2,473	(2,473)
Art & Design (Sch)										13,681	13,892	(211)
Communication (Sch)										5,773	12,158	(6,385)
Music (Sch)										13,118	7,452	5,666
Theater & Dance (Sch)										5,762	6,693	(931)
Health & Human Performance	3,467	4,164	(697)	3,545	1,513	2,032	6,509	0	6,509	37,139	29,526	7,613
Human Ecology	12,006	9,505	2,501	996	5,239	(4,243)	861	0	861	28,537	30,262	(1,725)
Technology & Computer Science	19,248	20,086	(838)	6,283	8,400	(2,117)	6,419	1,668	4,751	22,893	24,759	(1,866)
Academic Library Services										16,971	22,238	(5,267)
Centers/Institutes (not in Colleges)										12,695	1,352	11,343
<i>Subtotal--Colleges/Academic Units</i>	<i>181,650</i>	<i>220,828</i>	<i>(39,178)</i>	<i>69,020</i>	<i>101,371</i>	<i>(32,351)</i>	<i>75,149</i>	<i>119,723</i>	<i>(44,574)</i>	<i>348,690</i>	<i>361,783</i>	<i>(13,093)</i>
Chancellor Division										22,867	15,126	7,741
Academic Affairs Division							0	8,625	(8,625)	46,209	56,292	(10,083)
Student Life Division										66,355	49,262	17,093
Research/Graduate Studies Division							5,708	9,318	(3,610)	21,666	26,942	(5,276)
Admin & Finance Division										99,358	105,412	(6,054)
University Advancement Division										10,603	19,473	(8,870)
Foundations Division										0	3,234	(3,234)
Athletics Division										22,217	29,833	(7,616)
Unassigned										11,733	0	11,733
<i>Subtotal--Administrative Divisions</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>5,708</i>	<i>17,944</i>	<i>(12,236)</i>	<i>301,008</i>	<i>305,573</i>	<i>(4,565)</i>
<i>Grand Totals--Main</i>	<i>181,650</i>	<i>220,828</i>	<i>(39,178)</i>	<i>69,020</i>	<i>101,371</i>	<i>(32,351)</i>	<i>80,857</i>	<i>137,667</i>	<i>(56,810)</i>	<i>649,698</i>	<i>667,356</i>	<i>(17,658)</i>
<b>HEALTH SCIENCES CAMPUS</b>												
Allied Health	14,862	6,390	8,472	1,038	6,486	(5,448)	10,584	17,465	(6,881)	26,875	26,781	94
Nursing	7,507	4,684	2,823	1,093	7,436	(6,343)	1,525	0	1,525	26,136	29,280	(3,144)
Brody School of Medicine	12,562	5,106	7,456	223	3,276	(3,053)	105,462	208,420	(102,958)	217,405	254,246	(36,841)
Laupus Health Sciences Library										13,823	9,030	4,793
Health Sciences ECHI Institute										0	2,731	(2,731)
Health Sciences Administrative Division										0	14,751	(14,751)

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Health Sciences and Clinical

The Health Sciences and Clinical Assessment was performed by SmithGroupJJR during Task 3 of the Master Plan process.

### Introduction

East Carolina University has significant targeted growth set not only for the undergraduate colleges, but also for the Brody School of Medicine (Brody, the Medical School), College of Nursing, College of Allied Health Sciences, and School of Dental Medicine, which was opened on the ECU Health Sciences Campus in 2011. The Brody School of Medicine is ranked among the top medical schools in the country that emphasize the education of primary care physicians. In response to the national shortage of physicians and forecasted future demand, Brody School of Medicine is targeted to increase its incoming class size from 80 students to 120 students over the next decade. In addition to

the Medical School's current 350 faculty members (physicians and extenders), new faculty are actively being recruited to meet this increased teaching demand.

ECU Physicians is the organizational entity representing the clinical medical practices of the Brody School of Medicine faculty. It functions as the largest medical practice in eastern North Carolina. There are currently 24 different practice sites of ECU Physicians throughout Greenville and Pitt County serving 1.4 million residents across a 29-county area. The largest practice site is located on the Health Sciences Campus in Greenville and houses most of the specialized services.

A critical component of the campus master planning effort for the Health Sciences Campus was to conduct a Demand Analysis (Figure 16) to determine growth of ECU clinical services and identify key planning units for the development of clinical facilities.

### External Drivers

Influences for the expansion of clinical services include: The Institute of Medicine, the Association of American Medical Colleges vision for Medical Education in the United States, initiatives to improve patient safety and care quality, a diverse population with complex chronic conditions, and increasing market expectations with the same or diminishing resources.

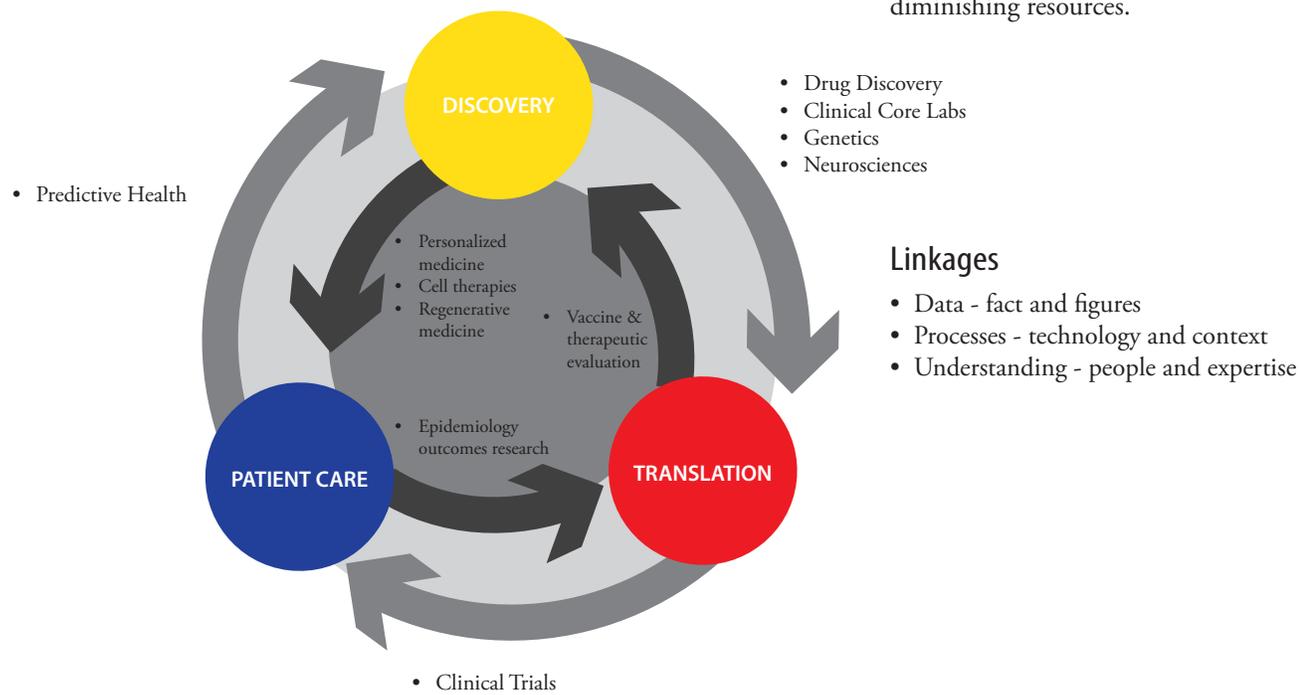


Figure 15 - Integrated and Interdisciplinary Education Diagram

In 2001, the Institute of Medicine published “Crossing the Quality Chasm”. The book’s release was a sentinel event for health professions education and care delivery. Its publication triggered a flurry of activity to redefine both educational programs and care delivery models as evidenced by various reports which began to define the problem in more detail and create care models focusing on patient care quality and safety.

Health professions practice has changed tremendously over the last century. Not only has it changed, new professions have been added as healthcare has become more complex in response to evidence based medicine and increasing technology. Surprisingly, though, health

professions education has remained relatively unchanged. Most health professional schools rely heavily on lectures and memorization of facts although simulation laboratories are emerging to allow the respective student to develop care skills and apply knowledge prior to actual clinical encounters. Such encounters in a real-time clinical setting are an integral part of the professional caregivers’ necessary experienced-based curriculum.

Unfortunately, most professional schools still educate their students in isolation from other professions; while healthcare practice is a team effort. Curriculum changes and new models of care are necessary to prepare students for the future of

healthcare. In addition, any requisite facilities must facilitate current and anticipated curriculum changes and care delivery models.

### Working Premise

A team-based approach to clinical care is optimum and the curriculum in and between health professions schools must foster integration, and necessary clinical environments also must facilitate an integrated / team-based care delivery model. Inter-disciplinary and inter-professional education, as well as care delivery, is the future. This future state must be reflected in facility developments which foster integration.

CLINICAL GROWTH ASSUMPTIONS	Growth Assumption	2008-2009		2020		2025	
		# Credentialed Staff	# Arrived Faculty Visits (Baseline)	# Credentialed Staff	# Arrived Faculty Visits	# Credentialed Staff	# Arrived Faculty Visits
<b>Medicine</b>							
Cardiovascular	7%	32	19,950	40	25,175	57	35,325
Family Medicine	7%	36	76,000	45	95,900	64	134,500
Internal Medicine	3%	53	42,475	60	47,800	69	55,500
Ob / Gyn	5%	16	18,750	19	22,375	24	28,500
Oncology	3%	19	39,375	21	44,300	25	51,375
Pediatrics	5%	57	36,850	68	43,500	87	56,100
Psychiatry	3%	25	13,700	28	15,450	33	17,900
Rehab / PT	5%	8	7,900	10	9,400	12	12,000
Surgery	3%	32	23,450	36	26,400	42	30,600
<b>Allied Health Sciences</b>							
Communication Sciences	5%	15	tbd	18	tbd	23	tbd
<b>TOTAL</b>		<b>293</b>	<b>278,450</b>	<b>345</b>	<b>330,300</b>	<b>436</b>	<b>421,800</b>

Figure 16 - Clinical Program Projections

## Implications

Various implications emerge from the working premise; key ones are:

1. Integration faces many challenges, not the least of them culture, history, and tradition.
2. Basic science and clinical integration at all levels will:
  - Solidify and reinforce team-based learning.
  - Assist in developing critical thinking skills.
  - Foster faculty interaction and collaboration.
  - Foster health professions interaction, team-building, and collaboration.
  - Facilitate translational medicine as well as evidence-based care delivery models.

3. Both vertical and horizontal integration in the basic and clinical sciences will be necessary.
4. Faculty development is paramount.
5. Faculty development must foster integration models.

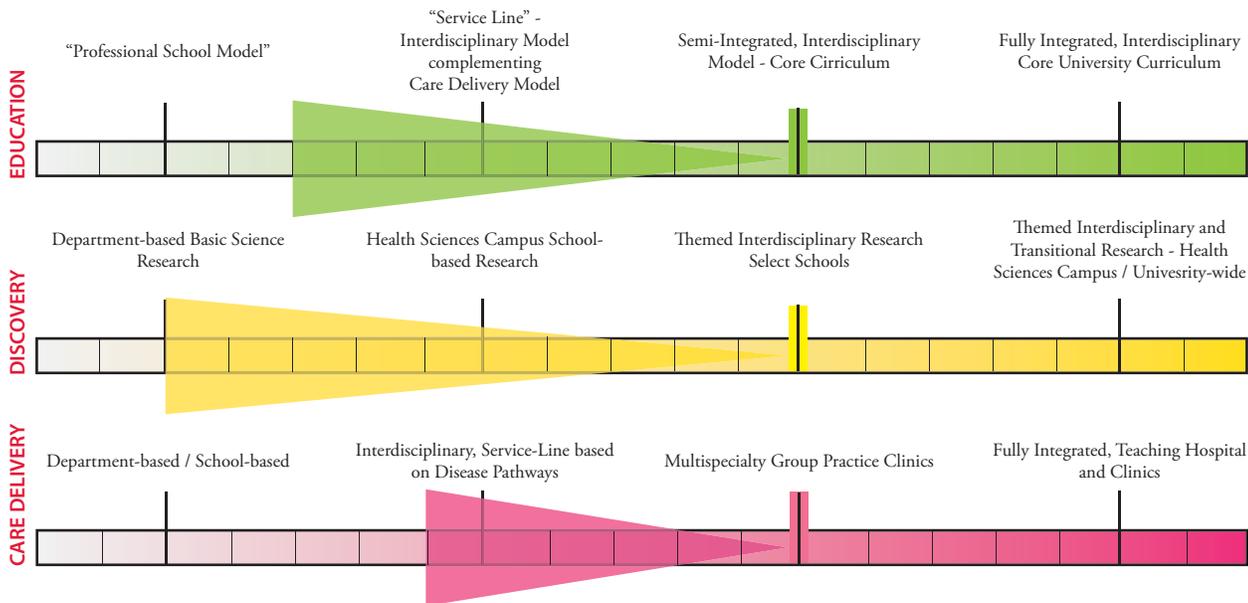
Healthcare is increasingly complex and faces ever increasing challenges to provide safe and quality care to diverse populations. A collective vision for ECU's Health Sciences Campus Master Plan development is a prerequisite if it is to become a leader in health professions education which requires continuous adaptation to an ever changing healthcare landscape.

## Health Sciences Master Plan Objective

The vision for the Health Sciences Campus is to create an integrated humanistic-oriented community-based care delivery, education, and research model, as demonstrated in Figure 17.

## Organizational Aspirations

1. Master Plan will encompass current and anticipated programs and services on the Health Sciences Campus. Off-campus development will be considered, as applicable in support of select programs.
2. Desire to create an integrated Health Sciences Campus respectful of student and faculty support and patient access.



**Figure 17** - Continuum-of-Education showing current and proposed future state

3. Efficient and effective.
4. Consistent goal of aligning clinical service, education and research leadership with health needs of the region.
5. Desire to provide an integrated core curriculum in support of inter-professional education across the Health Sciences Campus schools.
6. Continue and strengthen regional growth in support of current and anticipated program development.

**High Level Observations – Clinical Programs**

1. Current Primary Service Area and Secondary Service Area growth will not provide sufficient clinical material to support medical school growth.
2. Additional market-based growth and market share increases will be necessary to support clinical education and strategic relationships must be defined.
3. Additional program / satellite locations will be necessary to provide sufficient educational / research venues for anticipated education and research program growth.
4. The current on-campus facility development philosophy is based on a fragmented delivery system or a health-mall model which may not be sustainable or necessarily desirable given wayfinding / access considerations as well as available land.
5. New facilities such as Moye foster continued fragmentation (not integration). Acquiring existing Greenville-based practices also fosters fragmented delivery and educational models.

**Integration Concepts**

The degree of integration within the academic medical center is variable and often driven as much by cultural values as pedagogic philosophy.

The major driver of integration as a response to an era of resource constraints, however, is consistent; enhanced alignment offers many benefits:

1. Increased productivity.
2. Reduced duplication.
3. Support of knowledge management.
4. Support of emerging disciplines.
5. Development of evidence-basis.
6. Optimized care delivery.
7. Enhanced safety, quality and value.

A ‘continuum-of-integration’ has been introduced and a set of future-state scenarios developed for the academic, discovery and clinical care components of the Health Sciences Campus. The working model recommends the following long-term developments:

1. Education - will develop toward a semi-integrated, inter-disciplinary model with a core health sciences curriculum.
2. Discovery - will develop toward a themed interdisciplinary research model across selected schools.
3. Clinical Care - will develop toward a multi-specialty group practice clinic model.

**Clinical Delivery Facility**

Given existing fragmentation primarily based on facilities developed for various physician specialties or clinical programs (e.g. Family Practice, Cardiovascular, Cancer, etc.), we recommend developing a substantial facility based on a multi-specialty clinic model, including a comprehensive cancer care center. Such a facility will foster clinical-based education and care delivery models most likely to be encountered once students graduate. The new facility must recognize certain on-campus facilities such as the Cardiovascular Center and Family Practice Center, while providing the basis for a fully integrated clinical and clinical education program. The various professional schools and anticipated school of public health must also develop facilities which foster integration at the basic science as well as clinical science level not withstanding integrated research and translational research programs.

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Student Life

The Student Life Assessment was performed by Brailsford & Dunlavey during Task 3 of the Master Plan process.

### Introduction

One aspect of East Carolina University's master plan process has been to develop a list of capital projects related to the student life facilities. The student life facilities at East Carolina University include student housing, dining, student recreation, and student union / student center. This report includes findings and recommendations prepared for ECU during the course of the study.

The planning process consisted of three major phases. Phase 1, Project Initiation, involved student life committee meetings, campus and facility tours, preliminary stakeholder interviews, and review of existing docu-

ments. These initial steps allowed all parties involved to gain a better understanding of the unique issues and conditions at ECU. Phase 2 of this process was the Market Analysis. The Market Analysis phase included a demographic analysis, focus groups and intercept interviews, off-campus analysis (housing and recreation), peer institution analysis, student and faculty / staff surveys, and demand analysis. In-depth research on ECU and the surrounding community was performed during this phase with initial recommendations formulated. Phase 3 of the master planning process was the Program Review. This phase consisted of the program development and coordination, capital project list formulation and preparation of the final report.

### Findings

Analysis determined that the student life facilities play a critical role for ECU with respect to enrollment management (recruitment and retention of students), campus community (creation of student life hubs), and enhancement of educational outcomes (extracurricular activities and student involvement). ECU intends to strengthen its student life programs through significant improvements to its residential, dining, recreational, and student center facilities.

With respect to the residential program, ECU intends to meet the Carnegie Classification of a residential campus. This means housing at least 25 percent of degree seeking



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undergraduate students. In order to meet this goal, ECU will have to provide between 5,600 and 5,700 beds. With the current capacity of the residential program at 5,491, the improvements will address, primarily, the quality of offerings through replacement of under-performing buildings, de-densification of some facilities, and suite-style conversions.

While the residential program is not likely to grow significantly in the foreseeable future, an addition of beds in one of the campus neighborhoods (while other neighborhoods lose beds due to de-densification) may necessitate increasing capacity at one of the dining halls. Todd Dining Hall appears to be the most logical choice, due to the limited land availability near the West End Dining Hall. One of the most important student life facilities at ECU is Mendenhall Student Center. Through research and analysis, it was determined that the current facility is deficient with respect to functionality (demand vs. supply of desired activity spaces), overall building organization and wayfinding, as well as the physical condition. The facility no longer meets ECU's strategic objectives and, therefore, should be replaced with a new student center. This new structure should be located in the same campus neighborhood as the existing building, while Mendenhall should be re-purposed to serve other campus needs.

The student recreation programs at ECU are very popular among students and successful with respect to both variety and quality. Gener-

ally, the Student Recreation Center is functional but certain areas of the building get over-crowded during peak hours. As a result, it is recommended that ECU consider increasing the space available for group exercise, weight machines / free weights, cardiovascular fitness, and basketball court space.

In addition to addressing the Main Campus, ECU should consider the creation of a student life hub on the Health Sciences Campus. The Health Sciences Campus does not currently offer any meaningful quality of life facilities to satisfy the student demand. To address the shortfall, construction of a hybrid student center / recreation center building with appropriate food service offerings is recommended. Students taking classes at the Health Sciences Campus did not express strong interest in housing in that location and, therefore, no housing developments are recommended at this point.

### Capital Project List

Research and findings led to development of the following capital project list:

#### Residence Life

1. Replacement of Belk Hall with a new 500-bed, suite-style housing facility.
2. De-densification of Fleming Hall from traditional doubles to traditional singles (primarily through furniture re-arrangement).
3. Conversion of Green Hall from traditional doubles to suite-style units.
4. Conversion of White Hall from

traditional doubles to suite-style units.

5. Construction of a new 400-bed, suite-style residence hall to maintain the balance of 5,600 to 5,700 beds, as identified in ECU's strategic objectives.

#### Residential Dining

1. Expansion of Todd Dining Hall by approximately 175 seats. The estimated size of the expansion is approximately 9,300 gross square feet.

#### Student Center

1. Replacement of the Mendenhall Student Center with a new comprehensive student life facility. The estimated size of the new development is approximately 232,000 gross square feet. Mendenhall should be considered for re-purposing.

#### Student Recreation

1. Main Campus - Expansion of the existing Student Recreation Center by approximately 62,000 gross square feet to accommodate additional activity spaces.
2. Health Sciences Campus - Construction of a new student life facility – a hybrid of a student center and a recreation center sized at approximately 73,000 gross square feet.

During the course of the master planning efforts, the Residential Life and Student Center Plans have been presented to and well received by the East Carolina University Board of Trustees.

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Safety and Security

The Safety and Security Assessment was completed by Protection Engineering Group during Task 3 of the Master Plan process.

### Introduction

A major focus of the Campus Master Plan was to enhance the safety and security of the University's assets, which include people, information, and facilities, against security threats such as crime (traditional and non-traditional) and other hazards. The SmithGroupJJR team conducted an in-depth survey and analysis of the existing Security Program that provided recommendations on how best to improve ECU's security posture.

Overall, ECU has made a great deal of headway towards improving the safety and security of the University's facilities in large part due to the individual efforts of staff members

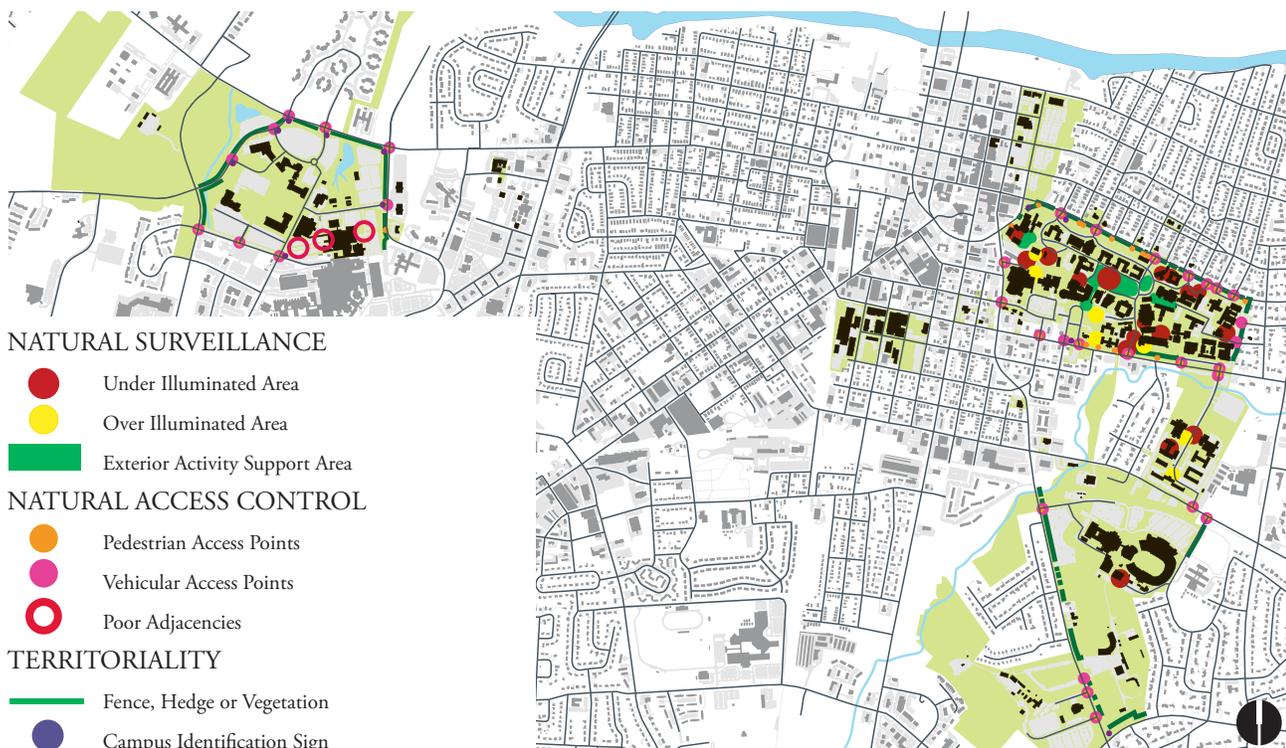
and departments. Many areas have implemented new procedures and equipment to mitigate potential threats, unfortunately this has not been coordinated as an overall campus effort. This has caused a duplication of effort and created a piece-meal security system with various levels of protection, creating areas where security is considered insufficient. There is a significant lack of university level policies and procedures, minimal criteria for the selection and implementation of services or equipment, no university-wide budget or procurement process for security related equipment or services, and the University has implemented multiple electronic security systems that are not integrated to function as a single system.

### Findings

This information aided development of a comprehensive East Carolina University Strategic Security Plan and Security Master Plan, as well as the integration of security into the overall Campus Master Plan. The overarching concept was to establish a centralized security program that is committed to the development of a cohesive and consistent level of safety and security at the University.

### Strategic Security Plan

This Strategic Security Plan has six strategic goals to facilitate progress toward meeting the vision and mission of ECU's security program:



1. Institute University Security Policies.
2. Establish a Centralized Security Organization.
3. Develop Security Plans.
4. Develop Security Operating Procedures and Programs.
5. Implement Physical Security Improvement Projects.
6. Establish New Police Facility.

The Security Design Criteria provides guidance to architectural and engineering (A/E) design teams, security consultants, and all ECU staff for the design and construction of ECU facilities. This document defines performance standards for physical security systems with information in key areas to ensure compliance with the goals and objectives stipulated in the University Strategic Security Plan and Security Master Plan for the University. This document defines the minimum security criteria required for ECU-owned and leased facilities and the spaces and assets within those facilities. This document applies security measures consistently throughout ECU to all spaces and is an integral part of the planning, design, and construction of all projects. An objective of this manual is to provide cost effective design criteria that provides an appropriate level of protection to each facility.

### **Crime Prevention Through Environmental Design Principles**

The most efficient way to implement security into a building and campus is through pre-design planning. ECU advocates the integration of Crime Prevention Through Environmental

Design (CPTED) principals and strategies in their site planning and facility designs. CPTED focuses on the positive use of space and natural elements to maintain a desirable quality of life for intended users, while increasing the difficulty for criminal or abnormal activities. These principles focus on the positive use of space to create designs that attract users because they feel safe, while simultaneously making it unattractive and difficult for criminals and terrorists.

The three main CPTED design principles are territoriality, natural surveillance, and natural access control:

1. Territoriality clearly defines an area by physically or psychologically utilizing a physical element to create an environment with a sense of ownership where abnormal behavior, such as unusual loitering or other unauthorized activities is easily recognized. A major component of territoriality is wayfinding, which is a concept where architectural and landscape features are designed with visual clues and signage to direct people or allow them to easily identify where they are and where they should go.
2. Natural Surveillance supports good visibility in and around the campus and buildings to limit concealment of criminal activities. The concept is to see and be seen; criminals do not like to be seen and guests feel safer when they are seen.

3. Natural Access Control is about using layout and design elements to easily direct site users in an orderly fashion from one location to another while reinforcing territoriality and aiding natural surveillance.

For the electronic security systems ECU will begin to standardize to one centralized security management system that is capable of integrating and centralizing the existing disparate systems, providing a cost effective approach. Additional improvements will include revamping the video monitoring center, consolidating the access control systems, and building a new facility to house the Police Department and Security Operations Center.

### **Security Master Plan**

The primary intent of the Security Master Plan is to implement a proactive and cost effective set of policies, plans, and procedures that will improve the overall safety and security of the University. The plan prioritizes assets based on the actual threats and risks ECU faces. The Security Master Plan establishes a long-term approach to building a security program trailer made for ECU that matches the current planned growth of the University. It provides a best practice approach to discourage a criminal or group of criminals from perpetrating an incident or crime.

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# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Infrastructure

The Infrastructure Assessment was completed by RMF Engineering during Task 3 of the Master Plan process.

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### Main Campus and Athletic Facilities

#### Chilled Water

Continued development of a centralized chilled water system is a key goal for ECU. Benefits of central cooling include energy savings, reliability, aesthetics, and noise reduction. Future growth on Main Campus will require an additional 9,250 tons of cooling capacity and distribution infrastructure to support both new buildings and existing buildings planned for connection to the chilled water loop. Two new regional plants, one located in the parking deck of the Academic A Building, the other located south of Belk Residence Hall will be required to provide space for the additional chillers. Additionally, existing Central Chiller Plant No. 1 will require a full build out bringing the total cooling requirements of main campus to 13,750 tons.

Based on their remote proximity, the buildings earmarked for the Millennial Campus and the Health and Human Performance (HHP) site would not be connected to the central chilled water system. Those facilities will be supported with unitary cooling equipment or small regional chilled water distribution systems.

#### Steam

ECU operates an established central steam plant and distribution network. Future growth on Main Campus will require an additional 51,000 PPH of steam generation capacity. The current steam firm generating

capacity exceeds the future demand and will not require additional boiler expansion. However, steam distribution system upgrades are required and include replacement of aged piping along with steam and condensate feeds to each new building.

Based on their remote proximity, the buildings earmarked for the Millennial Campus and HHP site would not be connected to the central steam system. These facilities will be supported by unitary equipment.

#### Natural Gas

Future growth has very little impact on the natural gas system on Main Campus. The majority of the natural gas consumed is for the boiler plant. The new lab building will require a feed from the main.

#### Domestic Water

The domestic water system will not require any significant improvements to support the future growth on campus. The network of piping through campus is extensive enough to provide ample water for both domestic use and fire protection. Each building will require two separate feeds from the nearest main. The minimum water pressure provided by the Greenville Utilities Commission (GUC) will require the use of a dedicated fire pump in each new building to meet code requirements.

#### Electrical

Utilizing the Main Campus power distribution system to provide electrical power to University

buildings is desirable from an energy cost standpoint. Therefore, the goal is to utilize the campus distribution where practical. Where the distance to proposed smaller buildings is excessive or when the building is labeled as private, it is likely they will have direct utility service. For the purposes of this report those facilities are included in the new loads associated with Immediate and Future as a worst case scenario.

The additional buildings identified as Immediate Need would add approximately 15MVA to the Main Campus electrical demand. Additions identified as Future would increase the demand for another 4MVA, for a total add to the Main Campus system of 19MVA. The two GUC Point of Delivery (POD) locations for Main Campus, Ficklen Drive (circuits 1 and 2) and 9th Street (Circuits 3 and 4) have rated capacities of 10MVA per circuit. The existing loading, reported by GUC as of June 22, 2011, for these circuits is 28 percent, 18 percent, 15 percent and 24 percent respectively. Therefore there is sufficient capacity to add both Immediate and Future buildings to the Utility Service. The campus 15kV loop circuits would require extension and redistribution of loads to accommodate the growth.

#### Telecom / Data

For new facilities located relatively close to the existing campus fiber loops, extending this service to the building would be recommended. Where it is not practical, new utility connections would be established. Based on the distance and expected

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usage, the decision to extend existing fiber would be made on a case by case basis.

### **Stormwater**

ECU is actively initiating a campus-wide strategy to reduce stormwater runoff and improve stormwater quality management. Proposed buildings in the central portion of Main Campus, Warehouse District, and the new residence buildings will have minimal stormwater quantity impact based on the impervious composition of the proposed site location. However it is recommended that new Best Management Practices be implemented. New drainage lines as well as some utility relocation will be required for new building sites. Office Surge Building and proposed buildings southwest of the athletic fields will require additional stormwater improvements to prevent increasing the stormwater runoff quantity in this area.

### **Sanitary Sewer**

Proposed buildings in the central Main Campus vicinity and residence area are located in close proximity to the existing GUC sanitary sewer main. Existing sanitary sewer lines in the proposed areas may have to be relocated for new building connections. All buildings can be connected to the surrounding nearby GUC system.

## **Health Sciences Campus**

### **Chilled Water**

Health Sciences Campus buildings are cooled with a central chilled water plant. Future building growth will require an additional 2,350 tons of cooling capacity to the plant. Along

with replacement and upsizing of several existing chillers, a 3,000SF chiller plant expansion to the west will be required. Distribution to the new buildings will be fed radially from the utility tunnel. Based on its remote proximity, the proposed Cancer Center would not be connected to the central chilled water system.

### **Steam**

Health Sciences Campus buildings are heated with a central steam plant. Future growth on the Health Sciences Campus will require an additional 35,000 PPH of steam capacity. The existing plant has adequate physical space to accommodate the new boiler and auxiliary equipment pending removal of hazardous waste storage space and equipment. Distribution to the new buildings will be fed radially from the utility tunnel.

### **Natural Gas**

Future growth has very little impact on the natural gas system on the Health Sciences Campus. The majority of the natural gas consumed is for the boiler plant. None of the proposed new buildings require a new natural gas feed.

### **Domestic Water**

The domestic water system will not require any significant improvements to support the future growth. The central plant's domestic water booster system is sufficiently sized to provide water to each new building. The central plant also operates a dedicated fire pump to provide fire water to each new building. Individual fire pumps will not be required in the new buildings. Domestic water to each new building will be fed from

the utility tunnel.

### **Electrical**

The capacity of the existing GUC service to this campus will not support any sizable new loads. To accommodate the Immediate and or Future electrical demand, additional service capacity will need to be provided, either by increasing the existing circuits or by the addition of new. The Cancer Center and the Future Clinical buildings would likely receive independent utility services due to their remote location from the existing campus.

### **Telecom / Data**

With the exception of the Cancer Center and two Clinical Buildings, the campus fiber could be extended to the proposed Immediate and or Future buildings.

### **Stormwater**

ECU is actively initiating a campus-wide strategy to reduce stormwater runoff and improve stormwater quality management. Expansion on the Health Sciences Campus will require additional stormwater measures to account for additional runoff that will be produced by the new impervious area. Construction projects that are currently in progress may affect this estimate detention number.

### **Sanitary Sewer**

The existing primary sanitary sewer main for this campus is over the recommended capacity. As such any new buildings will have to be either routed to the sanitary sewer main west of the campus or to a new sanitary sewer main that could run parallel to the existing main.

# Quantitative & Qualitative Analysis

## Capital Needs Assessment: Traffic and Parking

The Traffic and Parking Assessment was performed by Martin / Alexiou / Bryson, LLC during Task 3 of the Master Plan process.

### Introduction

East Carolina University is expected to see a significant amount of growth on both Main Campus and the Health Sciences Campus in the next 15 years. This growth will put pressure on the limited land resources and the transportation infrastructure serving the campuses.

The anticipated growth will increase the demand for parking as new students, faculty, and staff are added to the limited physical space. In addition to this increased demand for parking spaces many building projects planned for the next 15 years will reduce the available parking supply. This increasing demand for parking coupled with the decreasing

supply of parking will require changes to the University's parking infrastructure. While the existing system works well for the current conditions it is not adequate for a growing university.

This Campus Transportation Master Plan provides a strategy to meet the University's current and future transportation needs. It focuses on plans and policies that meet the needs of the University, which also help to enhance the campus environment and provide sustainable solutions. The Campus Transportation Master Plan presents recommendations for Pedestrians, Bicycles, Transit, Parking, and Travel Demand Management (TDM) programs.

### Plan Creation

Stakeholder involvement was critical to developing the Campus Transportation Master Plan. Numerous task force meetings were held to develop awareness and to exchange information and ideas with the University community. The campus community was also engaged on a direct level at open house events. Additionally, an online survey was conducted early in the process to help identify commuting trends and gauge attitudes about transportation options.

Extensive analysis also lies behind the Plan. Parking supply and demand were forecast into the future (Refer to Figure 18). Commuter addresses were mapped ('geocoded') to show

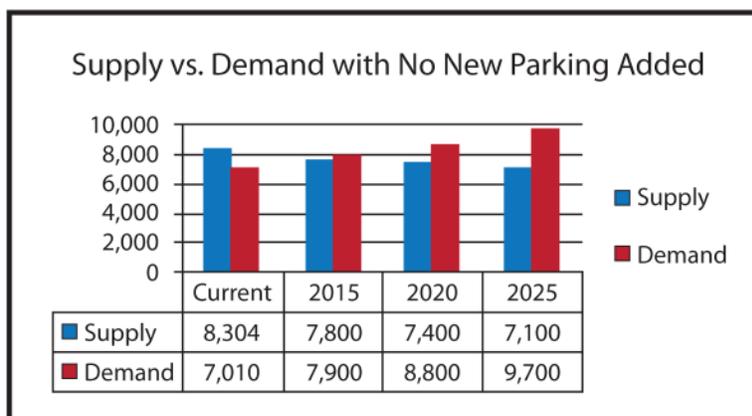


Figure 18 - Parking Analysis

which of the potential improvements would benefit the most people. The SmithGroupJJR team walked and rode buses around each campus and between campuses. A final round of events was held in Spring/Summer 2011 to present the draft Plan and confirm a broad level of support.

### Parking and Growth

Today East Carolina University has more parking spaces than demand requires. Many of the spaces are not located where the drivers would prefer, however. Specifically, there is a strong desire for more parking spaces in the center of Main Campus.

At the start of the 2010-2011 academic year, there were approximately 1,300 surplus spaces during the peak period. The bulk of these surplus spaces are located ½ to 1 mile south of Main Campus at the Minges Park & Ride lot and the lots near the HHP section of campus.

If no new parking were to be constructed between now and 2025 that 1,300 space surplus will turn in to a 2,600 space deficit.

### Plan Goals

The Campus Transportation Master Plan has the following goals:

1. Support the Physical Master Plan.
2. Identify cost-effective solutions to existing and future problems.
3. Identify and advance sustainable practices where possible and practical.

The Campus Transportation Master Plan includes a comprehensive set of strategies, as well as particular strategies for walking, cycling, transit, and parking. There are also strategies for managing travel demand. Each strategy contributes to the overall goals, and most importantly, all the strategies complement each other. Highlights from the specific recommendations for each strategy are listed below. Many of the recommendations contribute to several strategies.

### Pedestrian Improvements

Perhaps no mode of transportation is more important to the operations of a college campus than walking. Efficient and open paths between buildings are necessary so schedules can be maintained and buildings can be utilized effectively.

The Physical Master Plan has much in the way of design standards for paths on campus so the recommendations in this section focus mainly on what connections need to be made.

Recommendations and Supporting Policies:

1. Develop a better connection to the Reade Street Corridor including upgrading the intersection of Reade Street and 5th Street or possibly providing a grade-separated option.
2. Close Founder's Drive to through traffic in order to create a pedestrian-friendly central campus.
3. Improve paths along the periphery of campus. Many paths

along the periphery of campus, 10th Street, Reade Circle, and Cotanche Street, have undersized sidewalks and obstructions within the sidewalk.

4. Work with the City of Greenville to improve the 10th Street Corridor by creating a consistent cross-section and reducing the width of (or eliminating) some drive ways.
5. Work with the City of Greenville to improve sidewalks in the neighborhoods surrounding the University to improve the journey to campus.
6. Develop a wayfinding plan.

### Bicycle Improvements

Cycling is by far the mode of transportation with the most potential to grow. The climate is fairly temperate and the general terrain of the city is flat. These factors allow for an easier commute. There is good infrastructure on the campus to support cycling, and the recommendations in this section provide a path for improving that infrastructure significantly. The greatest improvement to cycling in the area will come in partnering with the City of Greenville to implement the projects outlined in the Greenville Urban Area MPO (GUAMPO) Bicycle and Pedestrian Master Plan.

Recommendations and Supporting Policies:

1. Add new paths around campus and new bicycle parking locations.
2. Work with the GUAMPO to implement the Greenville Bike Plan.

3. Continue to evaluate the need for bike racks on buses. This applies to both East Carolina University Student Transit Authority (ECUSTA) and Greenville Area Transit (GREAT).
4. Add a bicycle repair station on or near campus.
5. Work towards achieving Bicycle Friendly University status from League of American Bicyclists.
6. Provide cyclists access to showers, ideally located in multiple campus buildings.
7. Provide bicycle parking near all buildings where feasible.
8. Provide covered bicycle parking where possible including under eaves/overhangs of buildings, in parking decks, and in covered bike lockers.
9. Maintain and expand Pirate Ride.
10. Adopt a Complete Streets policy.
11. Discuss bicycle options with incoming students during orientation.
12. Work with Bicycle Advisory Committee to continue to refine this plan.
13. Promote bicycle options as an alternative to driving.

### Transit Improvements

ECUSTA runs a very robust, high quality and cost efficient transit service that aims to meet the varying needs of the student body. Throughout this project ECUSTA, in coordination with the SmithGroupJJR team, has made a number of improvements to the transit service to reduce redundancy and cost while maintaining the high level of service. Many of the low hanging fruits, such as reducing the

number of stops or consolidating routes, have already been picked. Near-Term Recommendations and Supporting Policies:

1. Consolidate afternoon service to apartments to more accurately reflect demand (planned for Fall 2011).
2. Develop a true main campus circulator route. This route could also serve downtown destinations that are adjacent to campus, but cannot serve downtown destinations that are not adjacent to campus.
3. Continued route consolidation.

Long-term Recommendations and Supporting Policies:

1. Shift transit hub to the new Student Union.
2. Develop new service and maintenance facility.
3. Expand focus from student-centric service to the entire campus community.
4. Shift the Red Route from 5th Street to 10th Street when the 10th Street Connector project is finished.
5. Create shuttle and/or circulator service for Health Sciences Campus.
6. Maintain and deepen relationship with Parking and Transportation Services. Consider consolidation.
7. Continue to develop a web-based transit portal that shows the location of all buses.
8. Add automated passenger counters to all buses and train drivers in techniques to improve accuracy of data.

### Parking Improvements

As noted above there is currently a surplus of parking campus-wide. That surplus is not expected to last long, potentially being completely eliminated within five years. Given the desired growth it will no longer be possible to continue to provide all faculty and staff, as well as some students, parking on or near the center of main campus. This means there will be a change in how parking is located and distributed which will require a new approach to meet the changing needs of the University and the campus population.

Main Campus Recommendations and Supporting Policies:

1. Construct a 5-story deck in concert with the new Student Union on the location of the existing WC-8 lot (near Mendenhall). This deck will need to be approximately 5 stories in height and have a capacity of near 1,000 spaces. Some spaces will be reserved for short-term parking and some for permit parking. Any short-term parking should be controlled via pay on foot stations. This deck will need to be constructed in the four to seven year time frame, depending on the pace of campus population growth and building construction. This deck could be constructed earlier to provide a cushion of spaces to offset any temporary losses due to construction.
2. Construct a new 1,300 space surface Park & Ride lot near the HHP section of campus. This lot can be constructed in phases as needed.

3. Construct one additional deck that provides a net increase of approximately 500 spaces. This deck is likely needed in the ten- to fifteen-year time horizon. Specific location is to be determined but initial thoughts are to construct this deck on the site of the existing surface lot on College Hill Drive south of 10th Street.
4. Consolidate parking permits and revise prices to reflect new parking options.
5. House freshmen resident students in residence halls on Main Campus. Maintain residence halls on College Hill Drive for upperclassmen where possible.
6. Adopt a “Park Once” philosophy to cut down on intra-campus vehicle trips during the day.

Health Sciences Campus  
Recommendations and Supporting Policies:

1. Construct a 700 space deck north of the Family Medicine Building with access to MacGregor Downs Road.
2. Construct 200 sub-grade parking spaces as part of the Medical Education Building.
3. Construct a lot of roughly 600 spaces to accompany the new Cancer Center.
4. Consolidate existing permit types, such as the A3, A5, and A7. The existing A, B, and C designation can be retained. Those permit types should be divided in to two sub-categories; one for the south side of the Health Sciences Campus and one for the north side of the Health Sciences Campus.

5. Begin charging visitors for parking to develop a fund to pay for/off set parking deck construction. Such fees should be limited at this time to a maximum of what PCMH charges.

**Travel Demand Reduction Strategies**

In addition to the parking strategies recommended above, the University should continue to promote and incentivize the use of alternative modes. Such policies can have a significant cost benefit for the University, potentially reducing the size of, or need for, the second deck on main campus. Travel demand reduction strategies also help to promote sustainable development and maintain land for buildings or open space.

Recommendations and Supporting Policies:

1. Construct a 400 space student storage lot, located in Warehouse District near Campus Police Station. Lot must be fenced and gated and served by transit once or twice a day. This lot could reduce parking demand on Main Campus by 400 spaces.
2. Examine the viability of Park & Ride lots for employees. Possible locations include (a) along Highway 264 near the North Recreational Complex, (b) on Stantonsburg Road near US-264, and (c) along S. Memorial Drive near Pitt Community College.
3. Consider parking restrictions for students, particularly

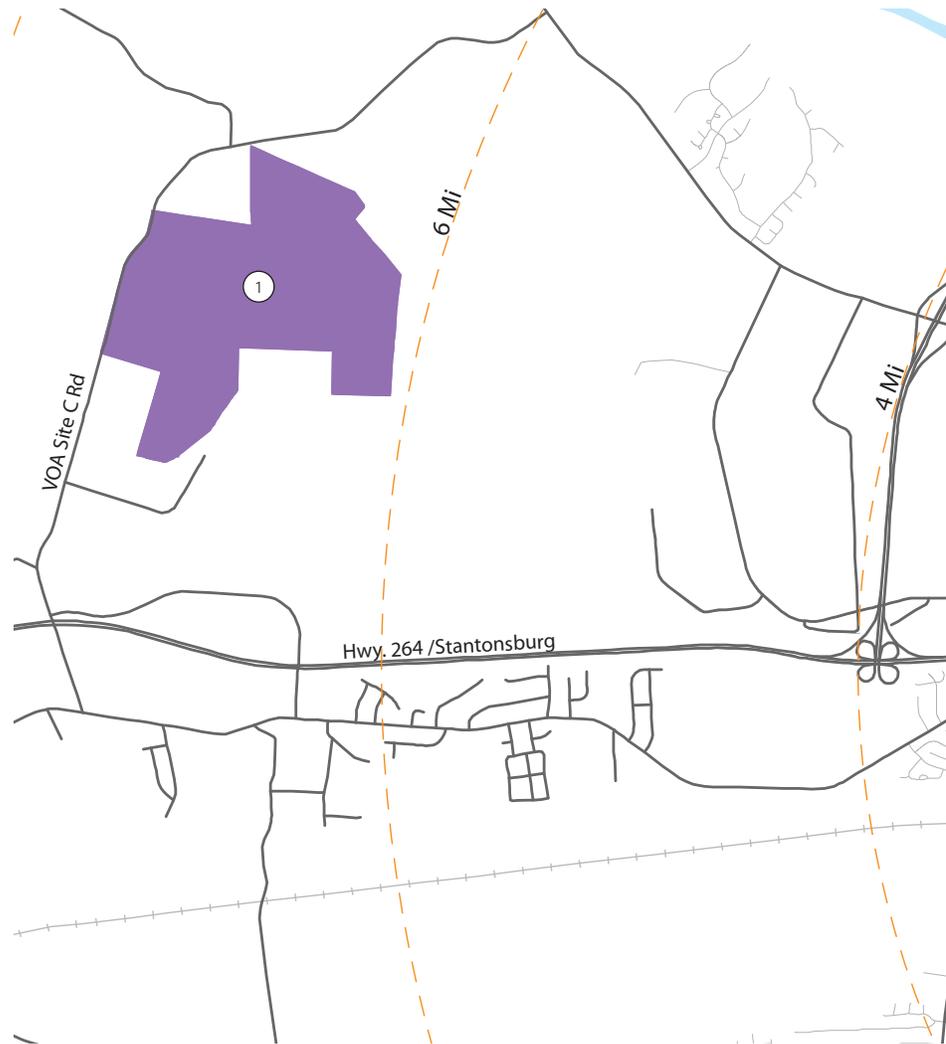
underclassmen and those living near campus or in apartment communities served by ECUSTA. Student parking bans have the largest potential to reduce parking demand.

4. Provide incentives to those persons who pledge to not buy a parking permit. Package could include passes for parking on campus five to ten days a year, access to shower and locker facilities for cyclists, and free or reduced cost GREAT transit passes.
5. Promote and refine ride matching service for those persons who want to carpool.
6. Reserve premium access parking spaces for carpool/vanpool riders.
7. Develop a process to monitor parking demand and update future parking demand annually or biennially.
8. Work to adjust class scheduling to minimize peaking.
9. Hire a full time TDM coordinator with a dedicated marketing budget as warranted.

# Physical Planning Analysis

## Regional Campus Context

- ① West Research Campus
- ② Health Sciences Campus
- ③ Warehouse District
- ④ Downtown Greenville
- ⑤ Main Campus
- ⑥ North Recreational Complex



### Location

East Carolina University is located in the eastern portion of the State of North Carolina, approximately 85 miles from the capital city of Raleigh. It is situated in the center of Pitt County within the Greenville metropolitan region.

According to the U.S. Census Bureau's 2010 findings, Pitt County is one of the fastest growing counties

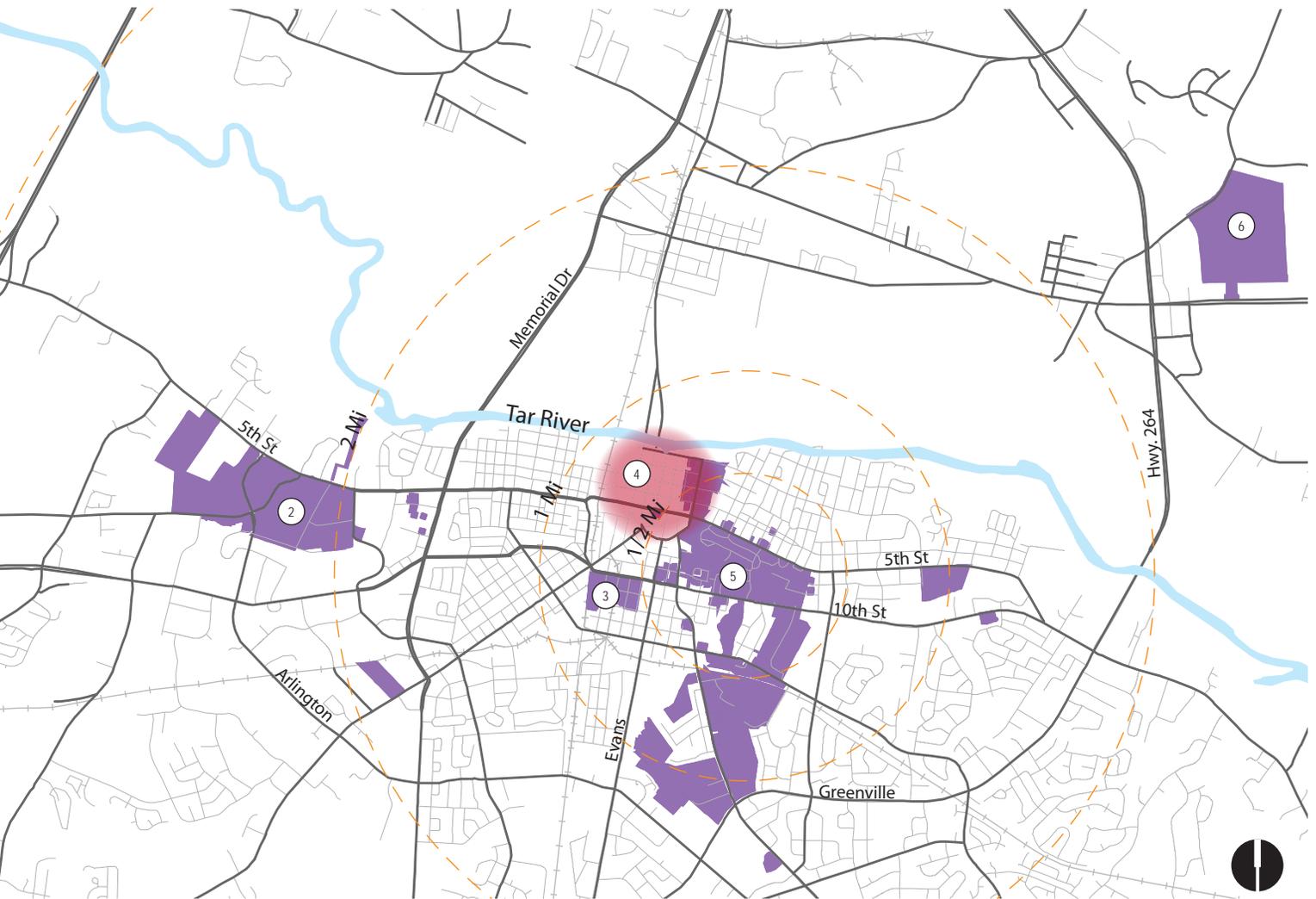
in North Carolina, reflecting a more than 25 percent change in population over the last decade. Greenville is the county's largest city with a population of approximately 85,000 permanent residents.

East Carolina University serves as a significant driver of economic development for both the state and the region with over two billion dollars generated annually for

the state's economy. In addition, East Carolina University and its educational partner, PCMH, both in Greenville, serve as the county's largest employers.

### Campus Composition

East Carolina University comprises four major campuses: Main Campus, Health Sciences Campus, West Research Campus, and the North Recreational Complex. The historic



Main Campus borders the eastern portion of Greenville's downtown business district. While this is ECU's second largest campus at approximately 410 acres, it provides the widest range of educational facilities and core student life activities for the University. The Main Campus' academic component is focused on the humanities, fine arts, business, education, and health and human development. The

Dowdy-Ficklen Stadium, located in the southern portion of the Main Campus, serves as the centerpiece to a well-developed athletics complex. All University-owned student housing is located on this campus.

ECU's Health Sciences Campus is located approximately 2 miles west of the Main Campus near PCMH. It serves as home to the University's health sciences professions.

The West Research Campus comprises 580 acres, with wetlands occupying approximately 65 percent of this land. It is located 7 miles west of the Main Campus. Biology and botany research is the primary focus of this campus.

Three miles northeast of the Main Campus is the North Recreational Complex. It is used for intramural sports and recreational activities.

# Physical Planning Analysis

## Main Campus Overview



J.Y. Joyner Library



Main Campus Mall



Residence Halls

In 1907, East Carolina University was established as the East Carolina Teachers Training College on 47-acres along 5th Street, east of downtown Greenville. This land now forms the historic Academic Core of the Main Campus' 410 total acres that has grown to support a campus population of 33,470. The campus maintains a linear north-south configuration stretching from the Tar River to Greenville Boulevard, approximately  $\frac{3}{4}$  of a mile to the south.

As mentioned on the previous page, ECU's Main Campus serves as the focal point for academic and student life activities with 175 buildings

totaling 4,807,026 square feet. The academic buildings predominantly lie in the eastern portion of the Academic Core with student life facilities focused to the west. An academic complex is located near the campus' southern boundary with a residential district centrally located between the academic and athletic districts. A Warehouse District is separated by three blocks west of the Main Campus along 10th Street.

A natural corridor consisting of woods, wetlands, and a flood zone run from 10th Street to the southwest portion of campus. These natural areas comprise 61 total acres of the Main Campus. Soils consist mostly

of sandy loams with some areas of hydric soil located within the Green Mill Run watershed area, woodland areas, and drainage areas south of the Tar River.

Topographic change is minimal in the built portions of campus. However, steep slopes do exist along the west edge of campus near the Downtown District and in the Green Mill flood plain areas. Campus elevations range from approximately 10 feet above sea level to 62 feet above sea level.

Utilities are easily accessible with major utility corridors running east to west in the central portion of campus and around perimeter streets.

## Health Sciences Campus Overview



Health Sciences Building



East Carolina University Heart Institute



Brody Medical Sciences Building

East Carolina University's Health Sciences Campus was established in the 1980s with the goal of locating the University's allied health programs closer to PCMH. As the flagship hospital for eastern Carolina and the teaching hospital for ECU's Brody School of Medicine, PCMH serves an important educational alliance for the University.

The Health Sciences Campus occupies approximately 200 acres from PCMH north to 5th Street. It is located approximately 2 miles west of ECU's Main Campus. The Brody School of Medicine is directly connected to the hospital to provide easy interaction between the two entities. The Health Sciences

Campus also includes some medical office properties that lie between Moye Boulevard and Memorial Drive. No Student Life programs exist on the campus, although private multi-family residential areas are located nearby.

Natural areas comprise approximately 96 acres of the Health Sciences Campus. This is defined by a natural wooded corridor that exists west of MacGregor Downs Road to the western border of the campus. A few small wetland pockets are also present within this undeveloped land.

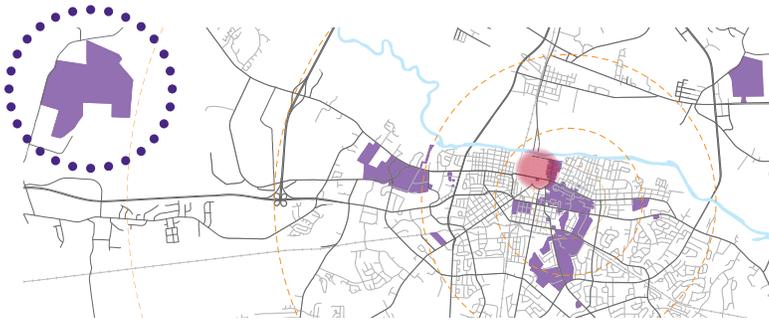
The property's soils are predominantly sandy loam with a few areas of hydric soils that may be limiting to

development. These soils are typically located east of MacGregor Downs Road and along the Health Sciences Campus' northern border with 5th Street. The majority of the site's drainage naturally flows towards 5th Street.

Overall, the Health Sciences Campus is relatively flat, but steep slopes do exist along the eastern edge of MacGregor Downs Road. Elevations range from approximately 30 feet to 66 feet above sea level. Major utility corridors exist in the center of campus making future expansion very feasible.

# Physical Planning Analysis

## West Research Campus Overview



West Academic Building



Weather Station



Research Facilities

The West Research Campus is a unique feature of East Carolina University's academic resources. The University acquired the 580 acre property, located approximately 7 miles west of the Main Campus, in 2001. It now provides an important research and educational facility for ecological studies with the unique advantage of allowing long-term experiments to be accommodated. This campus is used by a variety of ECU's research programs such as biology, ecology, field botany, field zoology, and ornithology.

The property is largely undeveloped with only four buildings constructed that comprise a total of 36,000 square feet of academic and storage

space on the campus. Metal radio transmission towers, numbering 20, are scattered across the site. A majority of the campus is occupied by 367 acres of wetlands, which supports a diversity of plant communities allowing for many research opportunities.

The majority of the campus is a poorly drained mineral flat with sandy loam soils. Of these sandy loams, most are limiting to building development. The upland areas of the property support woodlands and an open savanna-like habitat. Campus elevations range from approximately 66 feet above sea level to 86 feet above sea level.

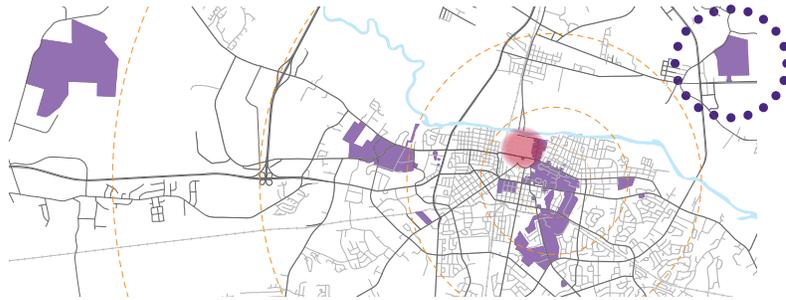
In 2008, an *Ecosystem Management Plan* and a *Proposal for WRC Land Use* were established to outline efforts to restore and maintain significant ecological characteristics of the campus. This includes the recommendation for biannual prescribed burns of all undeveloped areas.

Utility infrastructure is lacking on the campus, making future development here costly. For this Master Plan, the West Research Campus was eliminated from any consideration of further development.

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## North Recreational Complex Overview

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Field House



Multi-purpose Athletic Fields



Team Training Challenge Course

The North Recreational Complex is located approximately 3 miles northeast of East Carolina University's Main Campus, along Highway 264 East. Its intended purpose is to meet the recreational needs of ECU's students. A master plan for the 130-acre property was completed in January 2010 with phase 2 recently opened in August.

The complex features eight multi-purpose athletic fields which have been sized to accommodate soccer, flag football, lacrosse, ultimate Frisbee, and rugby. A field house is located adjacent to these fields to provide seating space, restrooms, and equipment storage.

The phase 2 development includes a boat house that overlooks a 6 acre lake for swimming, fishing, kayaking, and boating. A sand beach lines a portion of the lake.

The North Recreational Complex also features a 5K running trail, six walking/jogging trails, and a team training challenge course.

During this master plan process, no further site improvements were proposed for ECU's North Recreational Complex.



North Recreational Complex Master Plan (image courtesy of Site Solutions)

# Physical Planning Analysis

## Campus History and Growth

Beginning in 1902, a statewide campaign to enhance North Carolina's educational system gained widespread public support. As a result of this effort, the General Assembly voted in 1907 to establish a two-year teacher training college. East Carolina Teachers Training School was then established in Greenville on its present site, previously known as Harrington Hill.

Immediately following, a New York landscape architect, Louis Miller, was hired to envision the future of East Carolina Teachers Training School. The school evolved in a linear arrangement along 5th Street (now the Campus Core of Main Campus).

In 1920, the college transitioned to a four-year degree granting institution, renamed East Carolina Teachers College. President Wright oversaw this conversion and endorsed expansion plans in 1924 that resulted in creation of a more internalized campus layout.

By the 1930s, land surrounding the college had been developed into single-family residences. It was at this time that the campus began to expand to the southeast, taking on its current north-south linear configuration.

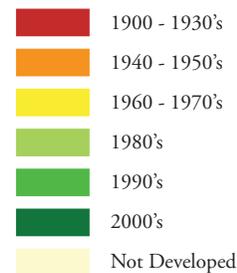
Establishment of the G.I. Bill in 1944 meant increased enrollment for East Carolina College. This propelled significant campus expansion efforts during the 1950s-60s. In 1967, the North Carolina General Assembly approved re-establishment of the college as East Carolina University.

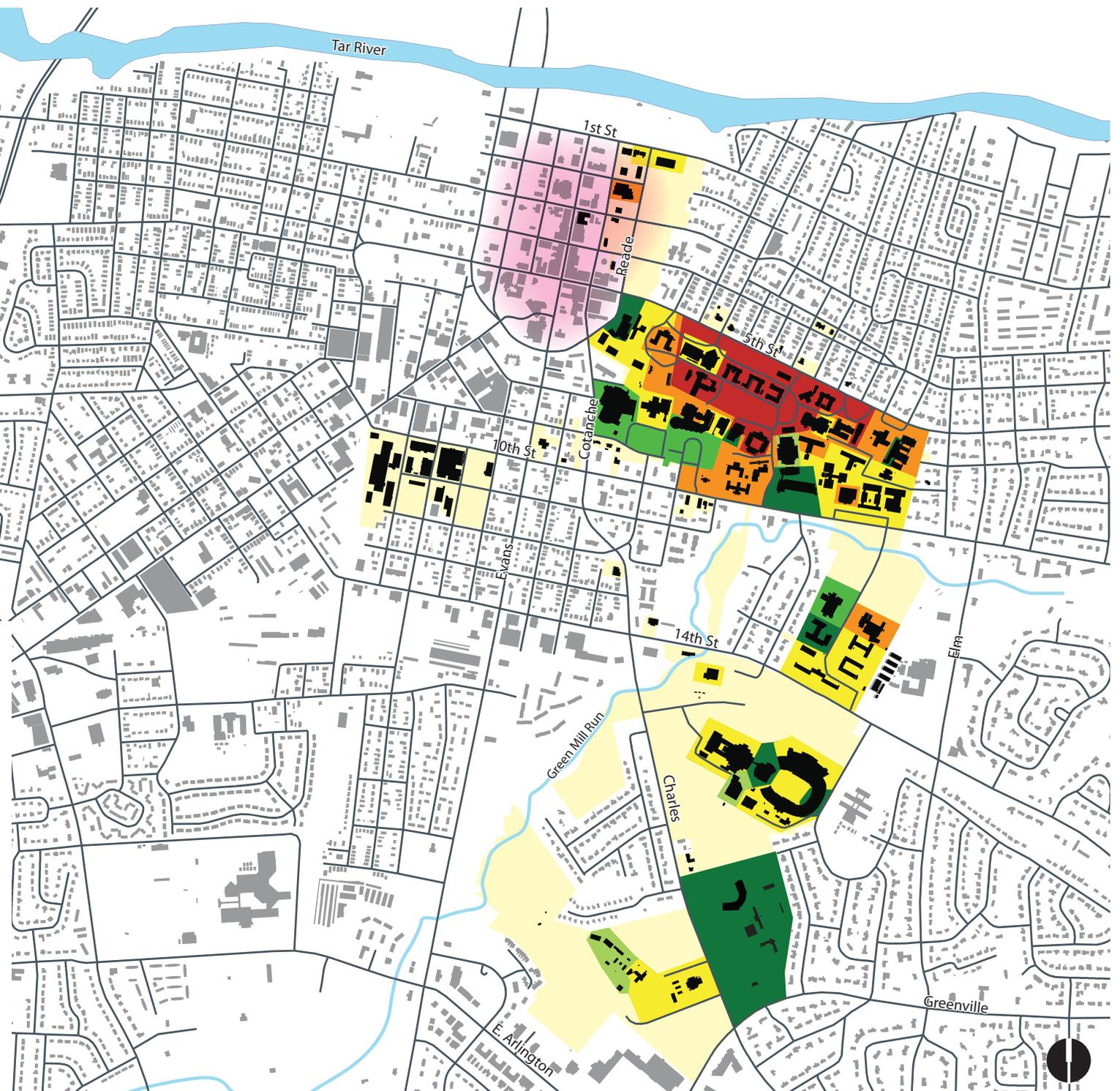


The Health Sciences Campus evolved in the 1970s with the purchase of 40 acres west of the newly planned PCMH. This campus continued to grow over the decades and has become an important regional medical destination.

By the 1980s, ECU's Main Campus had extended southeast to Greenville Boulevard with continued construction. During the beginning of the 21st century, ECU established two new campuses, the West Research Campus and North Recreational Complex. East Carolina University now comprises four campuses and nearly 1,000 total acres of land.

### CAMPUS GROWTH





# Physical Planning Analysis

## Community Context and Land Use

### Main Campus

East Carolina University has evolved from its presence along 5th Street a century ago to a linear north-south configuration today that stretches from Downtown to Greenville Boulevard. Development on Main Campus has tended toward segmented land use districts with academics focused to the east and student life to the west in the Campus Core. A Residential District is centrally located between the Athletic Complex and the Academic District and a Warehouse District is separated three blocks from the Campus Core.

In regards to floor area ratio (FAR), the Downtown District has a lower FAR than a comparable sized neighbor, such as is found between 1st Street and 4th Street (0.08 vs. 0.70). The Student Services District has a lower FAR compared to the Academic Core District (0.38 vs. 0.71) and the South Academic District has a relatively lower FAR (0.04) than the Academic Core District. The North and South Residential Districts have comparable FAR's (0.63 vs. 0.67)

### Health Sciences Campus

As previously mentioned, the Health Sciences Campus is entirely devoted to academic and institutional facilities with no student life programs. The Brody District has an FAR of 0.71 and the Learning Center District will have a FAR of 0.32 upon completion of the Family Medicine and Dental Schools. The Support Facilities District has a relatively low FAR (0.05) due to parking and retention, while the West Parcel remains undeveloped.

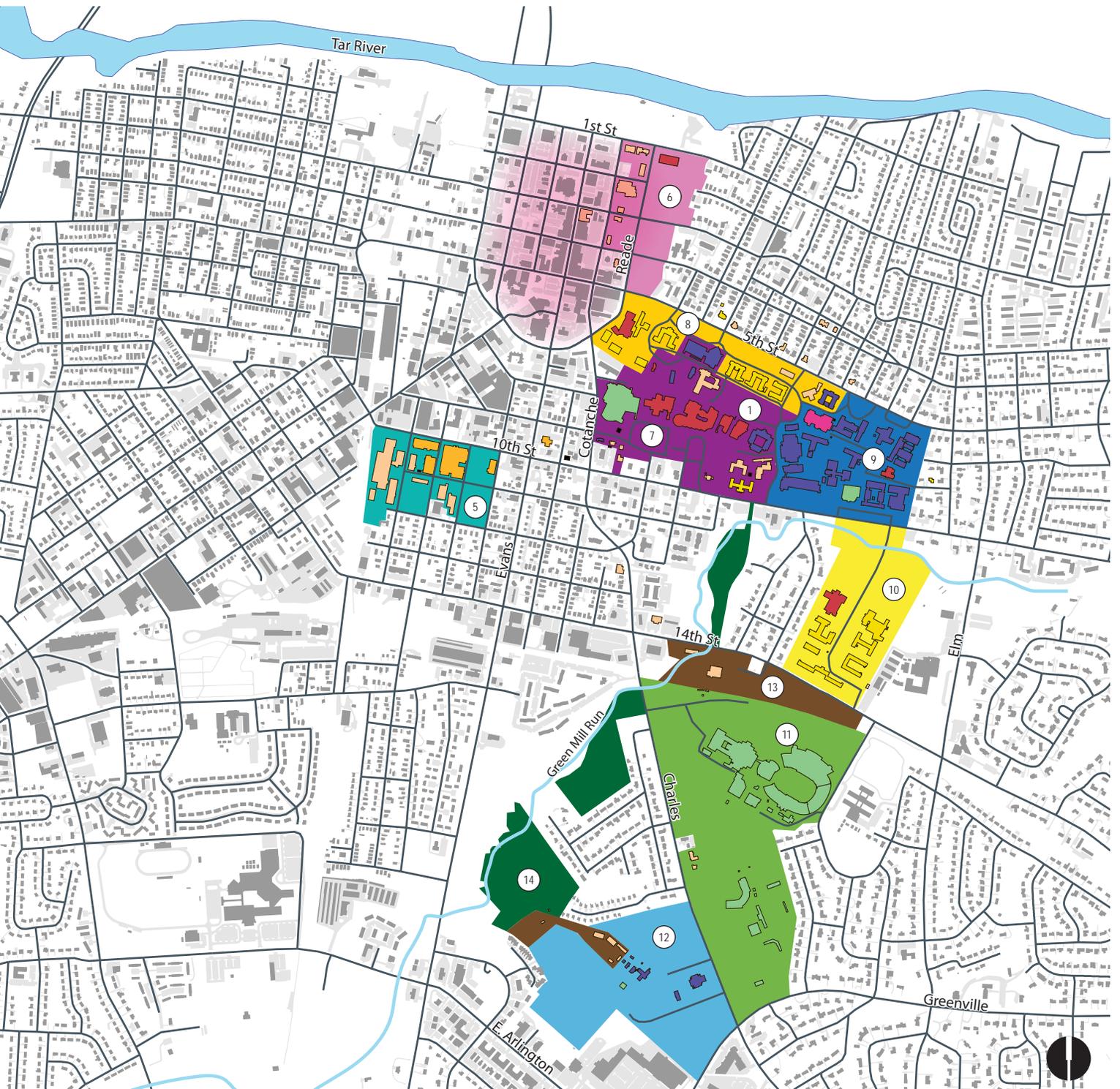


#### EXISTING BUILDING USE

	Academic Use
	Academic / Institutional
	Research
	Recreation / Athletics
	Natural Area
	Mixed Use
	Special Use (Union, Dining)
	Residence Hall
	Campus Service / Support
	Unoccupied

#### OBSERVED EXISTING DISTRICTS

	①	West Parcel District
	②	Learning Center District
	③	Support Facilities District
	④	Brody District
	⑤	Warehouse District
	⑥	Downtown District
	⑦	Student Services District
	⑧	North Residential District
	⑨	Academic Core District
	⑩	South Residential District
	⑪	Athletic / Recreation District
	⑫	South Academic District
	⑬	Support Facilities District
	⑭	Natural Areas District



# Physical Planning Analysis

## Natural Features Analysis

### Main Campus

The City of Greenville is located in the coastal plain region of North Carolina. The area is relatively flat and contains the fourth largest river basin in the state: Tar-Pamlico River Basin. The Tar River frames the northern edge of downtown Greenville and a tributary, Green Mill Run, creates a major drainage corridor through the southwestern edge of campus. Significant floodplains associated with Green Mill Run encroach on ECU property creating flooding issues on 10th Street during times of heavy rain.

The Main Campus is generally flat, except for river bank and floodplain areas which contain areas of steep slopes. The high point of campus lies at the intersection of Greenville Boulevard and Charles Boulevard. From this high point, a ridge runs beyond the eastern border of the campus through the Forest Hill Neighborhood, from Greenville Boulevard north to 14th Street. All campus stormwater runoff eventually discharges into the Tar River. Poor soils that limit building development are found in the floodplains surrounding the Tar River, Green Mill Run, and their associated tributaries.

Floodplain forests originally populated this land prior to European settlement. Now, natural wooded areas comprise 61 acres, or 15 percent of the Main Campus landscape. Approximately 30 percent of ECU's Main Campus consists of mown lawn areas scattered with canopy trees.



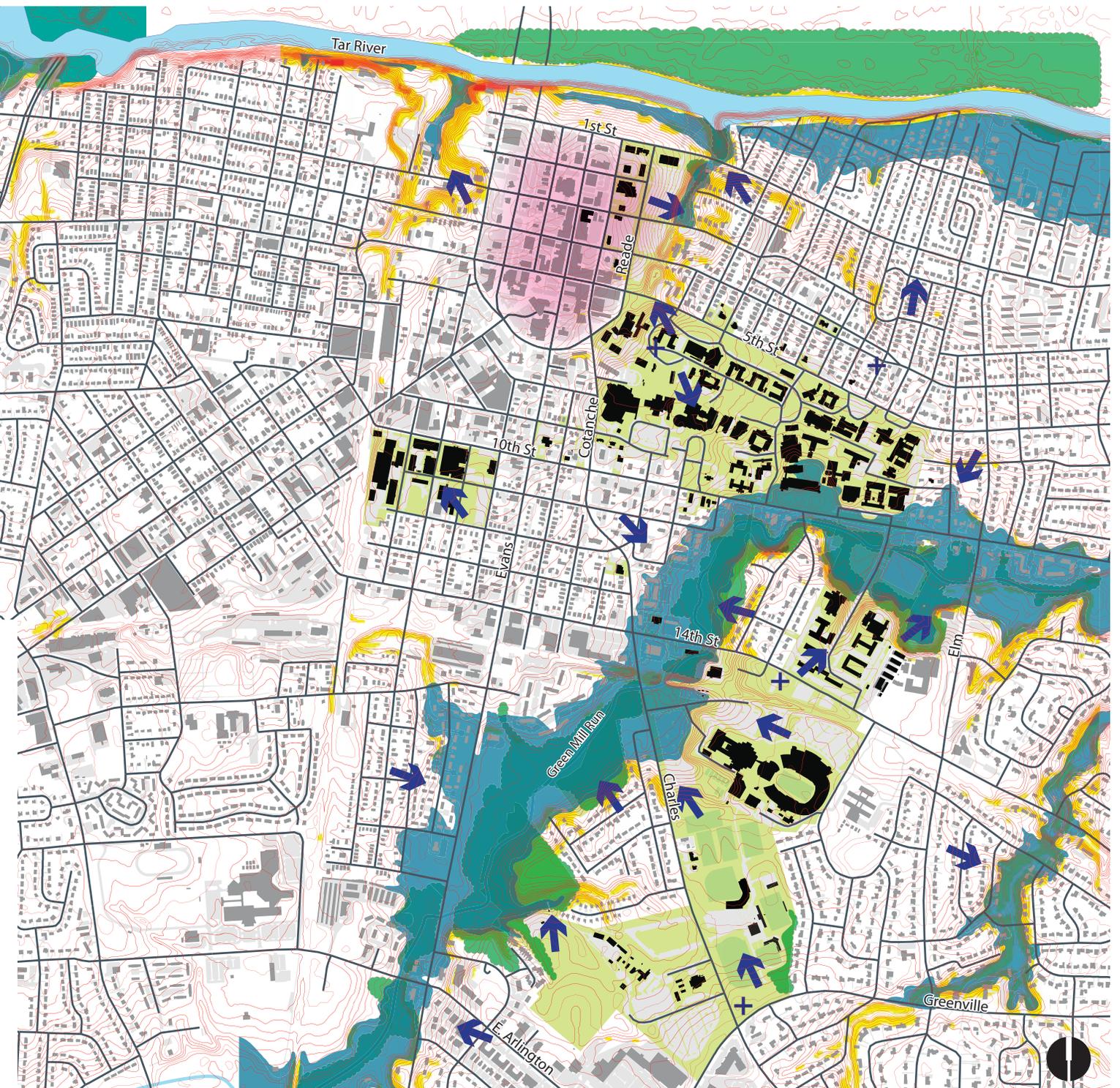
### Health Sciences Campus

The Health Sciences Campus is also located in the Tar-Pamlico watershed with all stormwater runoff ultimately flowing into the Tar River. A FEMA Flood Zone crosses 5th Street, but does not impact the majority of the campus.

Topographic change is relatively minimal except for steep slopes in a wooded area east of MacGregor Downs Road and lowlands adjacent to 5th Street. These are also the areas where hydric and limiting soils can be found on campus, although few wetlands exist.

#### EXISTING NATURAL FEATURES

- Wooded Area
- Flood Zone
- Water Body
- Steep Slopes
- 4' Contour Interval
- Surface Flow Direction
- High Point
- Campus



# Physical Planning Analysis

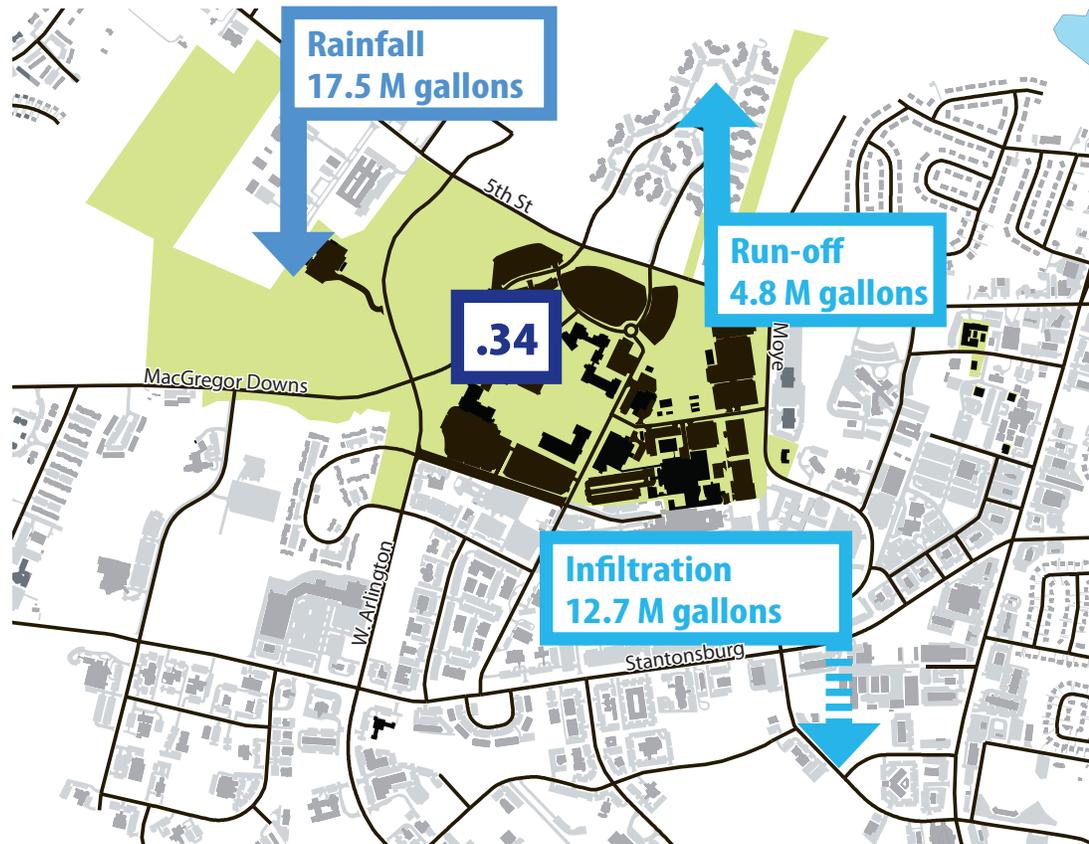
## Impervious Area Analysis

### Main Campus

East Carolina University's location within in the Tar-Pamlico watershed has historically resulted in flooding along 10th Street on Main Campus. It typically follows a heavy rain event and is due in considerable measure to development upstream. While activities upstream are out of ECU's control, the University does have the power to serve as a leader among institutions within Greenville and also within the UNC system for the incorporation of progressive stormwater initiatives on campus.

Prior to development, the land now occupied by ECU's Main Campus was wooded with a pre-settlement stormwater runoff coefficient of 0.05 and stormwater runoff volume of 1.7 million gallons. Compare this to the current runoff coefficient of 0.53 and 18.3 million gallons of stormwater that currently leaves ECU's property. These numbers indicate that significantly more stormwater is now flowing off of the site untreated and at a much faster rate, as opposed to previously infiltrating into the soil. A faster rate of runoff combined with large quantities of impervious surface are the leading causes of flooding.

The State of North Carolina has recently implemented a series of nutrient reduction requirements that have also been incorporated into the City of Greenville's stormwater regulations. The measures focus on capturing and treating stormwater at the point where it falls to reduce flooding and improve water quality. Currently, Main Campus has no



stormwater controls, which allows water to run directly into Green Mill Run and the Tar River. The University should use the City and State regulations as a guide and strive towards pre-settlement patterns.

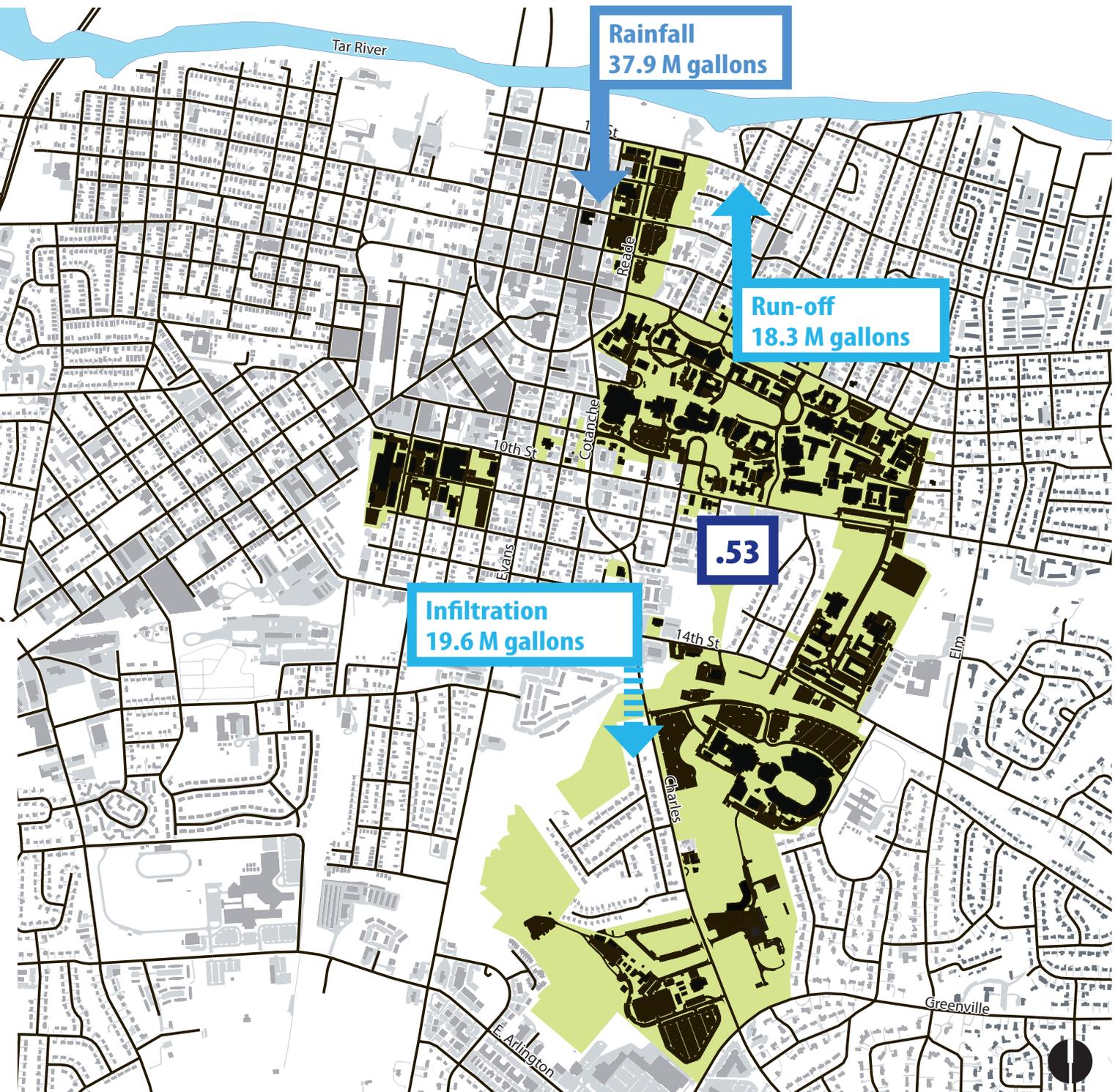
### Health Sciences Campus

Similar to Main Campus, the pre-development runoff coefficient and stormwater volume were significantly lower than they are today, 0.05 and 751,000 gallons versus 0.34 and 4.8 million gallons. As impervious surface increases on Health Sciences Campus through new growth, it will also be important to incorporate sustainable stormwater strategies.

### EXISTING IMPERVIOUS AREA

- Impervious Area
  - 50 acres Health Sciences Campus
  - 200 acres Main Campus
- Pervious Area
  - 140 acres Health Sciences Campus
  - 210 acres Main Campus

(runoff coefficients based on a 1 year/24 hour storm)



# Physical Planning Analysis

## Public Realm Analysis

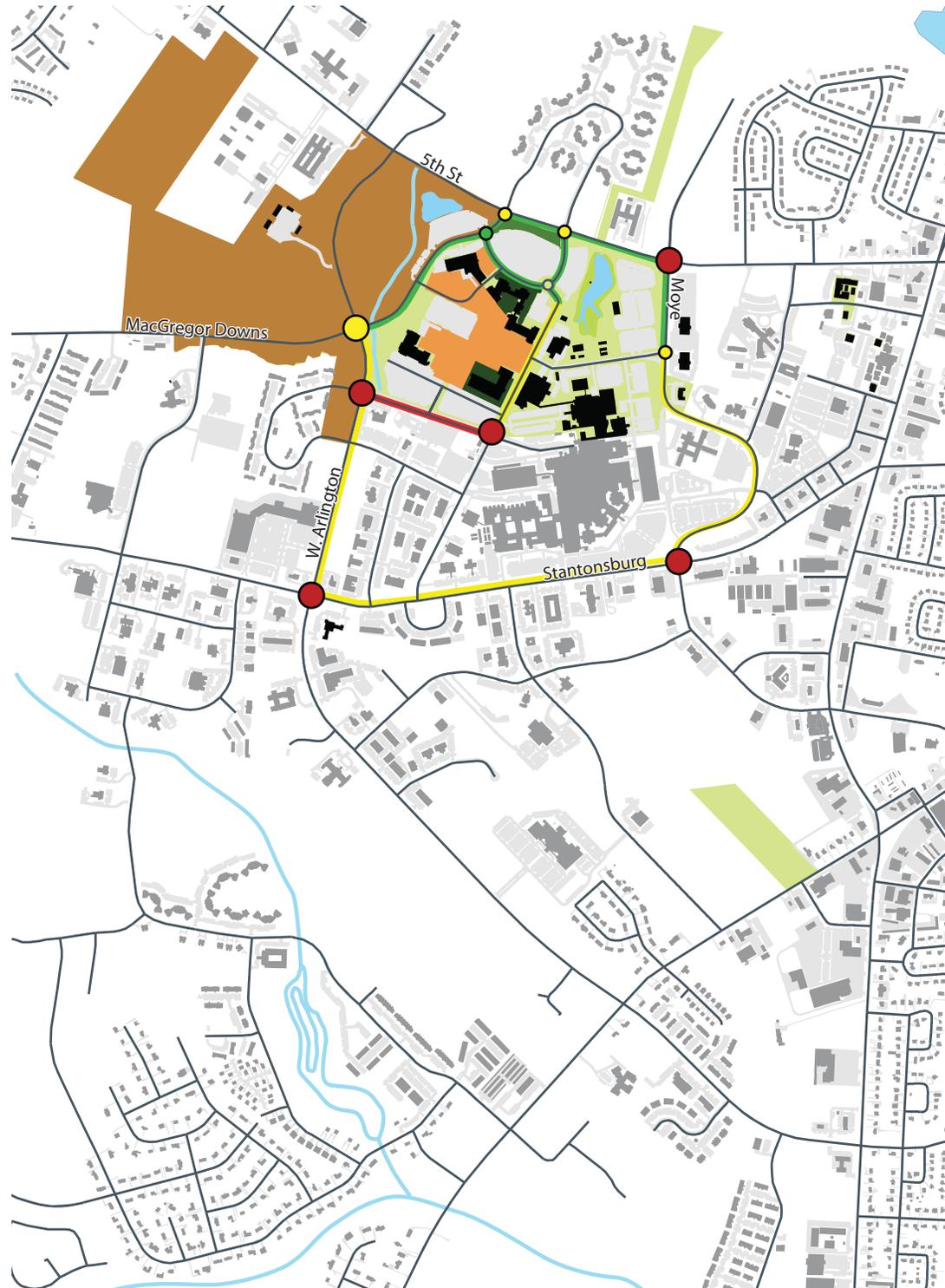
### Main Campus

East Carolina University's campus began along 5th Street. This history is visible in the fact that 5th Street demonstrates the most comprehensive and fully developed, high-quality edges and gateways on Main Campus. This corridor serves as a model for other areas of campus. Comparatively, 10th Street's edges and gateways range from medium to lower quality. ECU's edge with the Downtown District along Reade Street varies from a medium to low quality. It offers future opportunity for enhancement. Recent streetscape improvements along Charles Boulevard and at the intersection with Greenville Boulevard have improved the overall quality of this edge, befitting this important campus gateway.

The central mall within the Academic Core District serves as a highly contributing open space for the Main Campus. The Main Campus also benefits from a deep setback along 5th Street that is lushly planted. There are some exterior spaces, particularly in the central portion of the Main Campus, that lack definition and programming. These open spaces are most evident along the 10th Street edge and within the central Residential District.

### Health Sciences Campus

On the Health Sciences Campus, 5th Street and northern portions of MacGregor Downs and Moye Roads demonstrate high quality edges. However, the gateways in these areas are of a medium to lower quality.





# Physical Planning Analysis

## Circulation Analysis

### Main Campus

A primary goal of the Master Plan is to develop better connectivity and identity between Main Campus and the Health Sciences Campus, as well as with downtown Greenville. Presently, minimal indicators exist to inform visitors of the relationship between the two campuses. The information below highlights specific conflict locations on campus that should be resolved to encourage better and safer connectivity.

Pedestrian conflicts exist along 5th, 10th, and Cotanche Streets. This is due to a lack of pedestrian crosswalks along each street. 10th Street presents particular concern because it is a vital pedestrian crossing point on campus and supports a high traffic load. Railroad tracks south of 14th Street also bisect Main Campus and present pedestrian conflicts.

Seamless pedestrian connectivity across Main Campus is limited by pedestrian corridor gaps in several locations within the Academic Core, as well as between Campus and the Downtown District, Campus and the Warehouse District, the South Residential District to the Athletic District, the Carol Belk Building from Charles Street, and between Main Campus and Health Sciences Campus. In terms of vehicular connectivity, gaps are less prevalent on campus, but a strong vehicular link is lacking between Main Campus and the Health Sciences Campus.

Vehicular and pedestrian conflicts exist at the Christenbury bus hub,



at the 10th Street and College Hill Drive intersection, and along Cotanche, 5th, and 10th Streets where a lack of crossings exists.

### Health Sciences Campus

Pedestrian safety and connectivity are the overriding concerns for the Health Sciences Campus. This is due to pedestrian/vehicular conflicts along 5th Street, gaps in pedestrian walkways between newer academic buildings, and campus streets that lack companion walkways. As mentioned above, the connection to Main Campus should also be reinforced.

#### TRANSIT

- ECUSTA & GREAT Bus Stops
- ECUSTA & GREAT Bus Routes

#### VEHICULAR

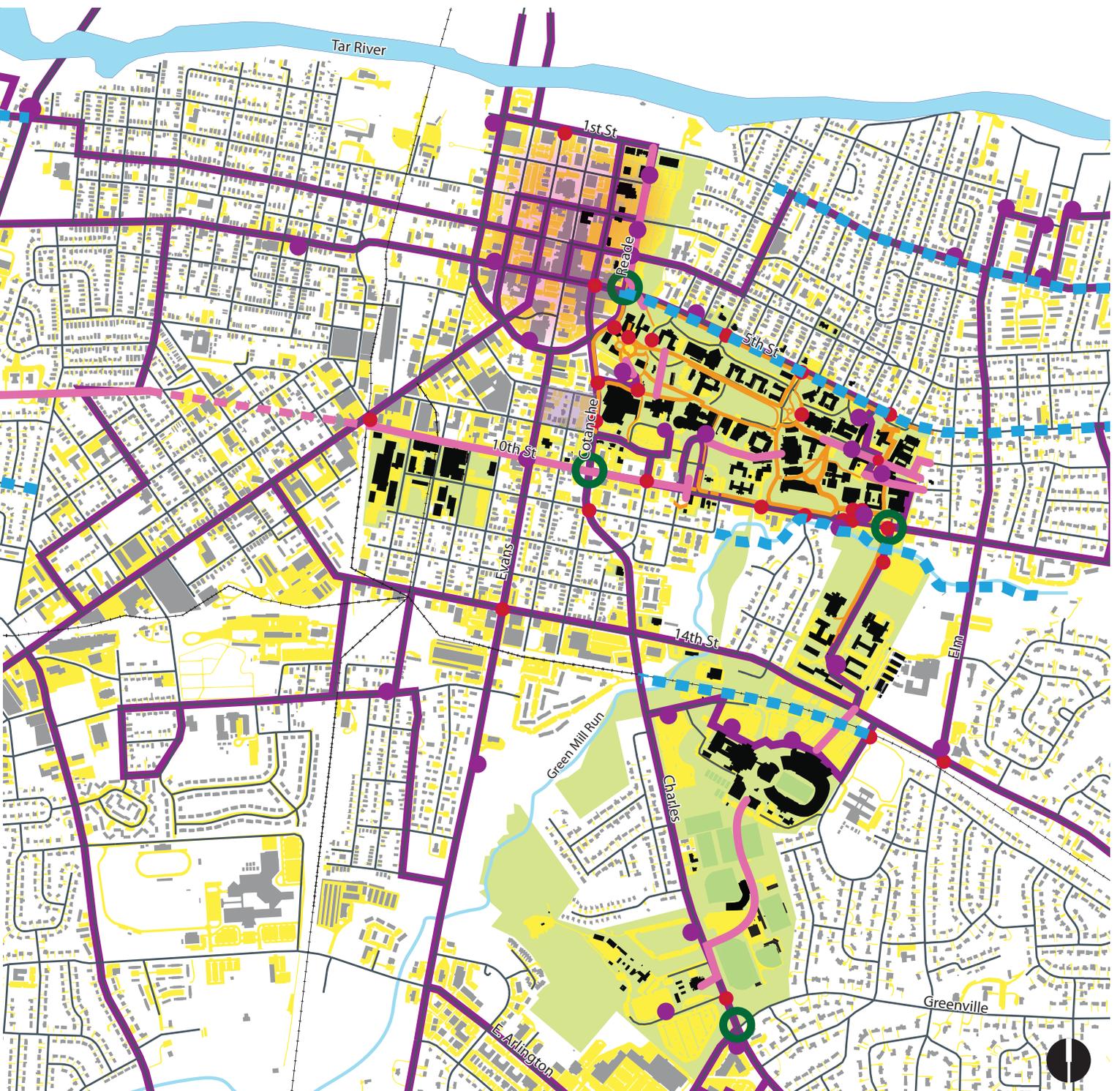
- Parking
- Road Network
- Existing Gateway or Gateway Needed

#### PEDESTRIAN

- Major Campus Network
- Existing Bike Route

#### CONSTRAINTS

- Conflicts
- Gaps



# Analysis Conclusion

## Planning Challenges

### Introduction

The analysis phase revealed numerous factors that significantly influenced the decision making process and shaped the physical character of the proposed Master Plan for East Carolina University. These challenges included issues uncovered during site analysis, as well as during discussions with various campus advisory groups. The challenges encompass items relating to compatible land use adjacencies, building condition and current program usage, pedestrian and vehicular circulation across campus, existing utility infrastructure, parking placement, and natural features.

### Buildings and Land Use

The existing spatial configuration of both ECU's Main Campus and the Health Sciences Campus served as the primary challenge to physical master planning efforts and informed the development of alternative schemes.

This particularly proved to be the case in determining the ideal placement of new academic facilities on Main Campus.

The Spatial Analysis findings, discussed earlier in this report, concluded that additional academic space was needed on Main Campus. However, the existing density of the Academic Core of Main Campus prevented the possibility of significant infill development and a floodplain boundary encroaches on much of the remaining undeveloped land. The analysis also revealed that academics were not nearly as integrated into the Campus Core District as previously imagined, with Founders Drive bisecting the core to create two distinct campus experiences.

It was ultimately determined that Christenbury Memorial Gymnasium should be demolished to provide space for a new building that will help define a science quad within

the Academic District. It was also determined that the Main Campus should expand near the Cotanche Street and 10th Street intersection to accommodate new academic and student service buildings. This would result in a student services core with areas of academic focus surrounding it. Prior to making these decisions, the demolition of existing university buildings was carefully weighed against expansion into other districts or onto adjacent private land. In the case of Christenbury Memorial Gymnasium, analysis concluded that the gym was under utilized and not universally accessible, with limited opportunity for upgrades. For the proposed academic and student service facilities, large building footprints and close proximity to the Academic District were desired.

Along 10th Street, existing retail and restaurant uses adjacent to the Student Services District prevent ECU from establishing a defined



Existing Main Campus 10th Street frontage contains narrow walks and non-campus uses.



Pedestrian, parking and transit conflicts at the existing transit hub, south of Christenbury Memorial Gymnasium.

edge and strong image. People entering campus from Charles Street are not greeted by a front door to campus. The SmithGroupJJR team took this concern into consideration when siting new university buildings. While ECU's spatial program needs could have been accomplished within existing campus lands, ECU's image would have remained challenged unless improvements were considered for its 10th Street edge. The proposed location of new academic and student service buildings on Main Campus will eliminate this concern by defining a gateway into campus and creating a unified facade along 10th Street.

The Spatial Analysis findings also concluded that a portion of ECU's residential facilities should be renovated and/or reconfigured during the master plan process to address changes in residential trends. Initial discussions with the ECU's Advisory Committee revealed that

no significant demand was present for residential facilities on the Health Sciences Campus. This focused consideration on infill development within the two existing residential districts on Main Campus. No significant buildable areas of land were present within the North Residential District and existing floodplain areas and steep topography limited development in the South (College Hill) Residential District. The space capacity and demolition studies suggested that Belk Residence Hall be demolished, presenting the opportunity for two new modern residence halls in its place.

The Warehouse District presented significant potential and very few challenges to development. With its existing position between Main Campus and the Health Sciences Campus, it was determined that it could serve as a new academic campus, as the headquarters for campus facility services, or as the

location for public-private partnership initiatives. The challenge was to find ways for the Warehouse District to reinforce connections between the campuses along 10th Street.

ECU's proximity to downtown Greenville presented exciting opportunities to enhance connections between the two. Presently, Greenville's downtown is under utilized and many streets, such as Reade Street, lack a defined streetscape. One goal of the master planning effort was to better integrate ECU with downtown and position it to serve as an economic engine for this area. A significant challenge was overcoming the campus community's perception that this area would be unsafe. The presence of an existing riverfront park and small performing arts facility suggested that a diversity of university facilities should be located in this area and that it can become a vibrant, safe extension of campus.



Founders Drive bisects the Main Campus from 5th Street to 10th Street.



Utilizing the existing Health Sciences Campus land is challenging when attempting to maintain patient convenience.

On the Health Sciences Campus, the disparate relationship of university buildings made consolidation of campus facilities a priority. Ancillary and Ambulatory Clinics are presently located in leased buildings across Moye Boulevard and near Memorial Way. It was a challenge to determine the correct adjacencies that would best serve faculty, students, and patients. It was determined that the Brody School of Medicine building is not currently serving medical education to its best capacity. This offered an opportunity to consolidate the clinics and position them adjacent to a new medical education facility, PCMH, and the existing medical institutes. This included finding a location large enough to accommodate a sizeable building footprint, as well as an area for surface parking.

## Parking

On both the Health Sciences Campus and the Main Campus, existing

surface parking areas currently interrupt pedestrian connectivity and dilute their respective open space networks. The objective of master planning efforts on both campuses was to discourage parking within the campus core to create open spaces for students to gather. On Main Campus, a challenge was helping people understand the value gained by displacing parking to the perimeter. The Health Sciences Campus also required careful consideration of parking needs versus open space enhancement.

With the reconfiguration of clinics near the proposed medical education facility and PCMH, it became evident that existing surface parking demands would increase in the southwest portion of the Health Sciences Campus. It was determined that surface parking lots should be designated solely for patients and that faculty, staff, and students should be accommodated on the periphery

of campus. The primary challenge for the SmithGroupJJR team was to find a balance between the provision of easily accessible surface parking for patients and proposed decks for faculty, staff, and students, while also creating a pedestrian friendly campus environment.

## Connectivity

Improvement of vehicular and pedestrian connectivity proved challenging on both campuses. ECU's Main Campus presented obstacles to both east-west and north-south pedestrian movement with the presence of surface parking areas, railway corridors, and poor alignment of certain existing pedestrian pathways. Analysis revealed that there was no safe way for pedestrians to move from the Campus Core to the South Academic District. Development of a unified circulation system required careful analysis of these existing conditions



Parking lots surrounding Austin, Rawl and Howell have become pedestrian thoroughfares in the Academic Core of Main Campus.



Existing crosswalks at the intersection of 5th and Reade are not intuitive.

to create a singular pedestrian network across campus. In addition, it was determined that bus transit service and bicycle amenities should be enhanced on the Main Campus. The existing configuration of certain bus drop-off areas, such as near Christenbury Memorial Gymnasium, proved awkward and necessitated change.

Pedestrian connectivity also posed significant concerns for the Health Sciences Campus. Recent development efforts have resulted in a lack of pedestrian connections between buildings and no sidewalks along campus roadways. The primary challenge was to define a coherent pedestrian network that would serve the dual purpose of encouraging greater pedestrian connectivity and knitting the campus together visually. Development of the proposed pedestrian circulation system was closely aligned to analysis of the existing transit system. The

enhancement project underway for the 10th Street Corridor suggested that greater connectivity between campuses could be achieved.

### Infrastructure

A significant challenge to master planning efforts that is not always readily apparent is the impact that infrastructure can have upon physical planning decisions. On the Main Campus, stormwater management presented the most significant infrastructure challenges to planning efforts. Existing flood concerns near 10th Street and the athletic facilities necessitated that floodwater relief areas be designated on campus. However, existing floodplain areas associated with Green Mill Run limited stormwater collection basins to perimeter areas of campus. In addition, the existing density of Main Campus reduced opportunities for large retention areas, encouraging the use of innovative stormwater management techniques. An

electrical substation, near the existing Student Recreational Facility, also shaped the physical composition of building expansion efforts on Main Campus and it was also important to consider major utilities located west of Founders Drive next to Umstead Hall.

Within the Health Sciences Campus, a large consolidation of utilities between Warner Life Science Building and Brody Medical Sciences Building impacted physical planning decisions related to proposed medical education facilities and surface parking. A utility tunnel, that starts at Service Drive and runs west to just before MacGregor Downs Road necessitated a division between the academic and institutional uses. In addition, stormwater infrastructure also challenged the planning process by requiring that a new retention area be located in the southwest corner of campus.



Service Drive at Health Sciences Campus is a pedestrian circulation barrier between Brody and the academic/institutional portion of campus.



The existing Belk Residence Hall is a visual and physical barrier to the Athletic District.

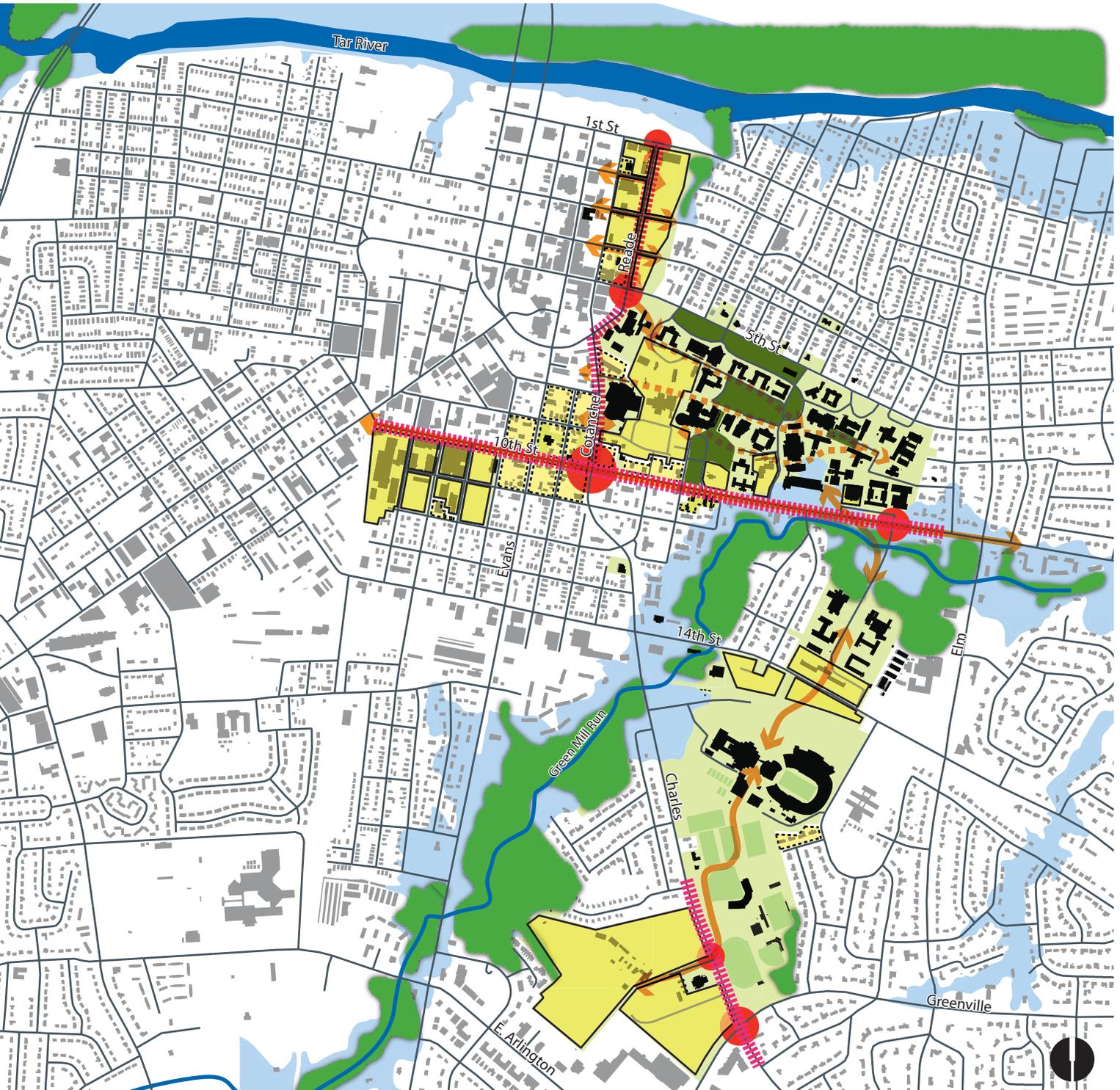
# Developmental Opportunities Plan

The Development Opportunities Plan serves as a graphic summary of all site analysis findings derived during initial stages of the master planning process. The analysis phase produced a series of information, that when overlaid, begin to reveal opportunities for change on campus and locations for potential campus expansion.

The areas highlighted in yellow on the plan indicate zones that are unencumbered by any of the three major analysis categories: natural features, public realm (community context and land use), and circulation. This can be expanded to mean that these areas are not constrained by floodplain concerns, significant woodlands, water bodies, or historic structures, to name a few of the specific analysis criteria.

The composite graphic presents a preliminary evaluation of strategic opportunities for change at East Carolina University to create a better overall campus environment. The Development Opportunities Plan suggests areas for increased density, improved pedestrian circulation, edge enhancement, and expanded open space networks. This plan includes land that ECU currently owns, while also suggesting potential strategic acquisitions.





# Campus Framework Plan

The Campus Framework Plan serves as a more refined version of the Development Opportunities Plan, presented on the previous page. It takes that information and moves one step further towards demonstrating specific planning ideas that relate to campus development patterns, circulation systems, and open space networks.

Approximate building locations that help to frame open space and encourage activity through density are proposed on the Campus Framework Plan. In contrast, the illustrative Campus Master Plan presented in this report presents an additional level of refinement and serves as one idea for the future development and enhancement of ECU. It provides detailed implementation suggestions for consideration by the University, whereas the Campus Framework Plan distills the overriding ideas embedded in the Master Plan Principles into generalized physical site initiatives.

It is understood that specific planning initiatives presented on the illustrative Campus Master Plan may likely change with time. Therefore, the Campus Framework Plan represents a more diagrammatic view of development and preservation priorities for East Carolina University and should serve as an important long-term reference plan to guide all future campus planning initiatives. The Campus Framework Plan reveals patterns of development that will remain viable recommendations for ECU well into the future.

