



JAMES MADISON UNIVERSITY®

CAMPUS MASTER PLAN UPDATE 2017

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Campus Master Plan Update 2017

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INTRODUCTION

I



CAMPUS MASTER PLAN UPDATE 2017

I OVERVIEW

INTRODUCTION

In the Spring of 2016, James Madison University began the process of providing an update to the 2008 Comprehensive Campus Master Plan. The goal of the master plan update is to provide a framework for campus growth through the year 2027 by creating sites for new buildings, while enhancing the overall organization and character of the James Madison University campus.

The plan also identifies early improvements to help sustain the momentum of JMU's recent growth. These suggestions and improvements should help maintain and develop a specific sense of place reflective of JMU's heritage while blending visually pleasing elements with functional realities. These suggestions and improvements include:

- New Building Sites
- Adaptive Re-use
- Replacement Recommendations
- Greening Initiatives
- Vehicular & Pedestrian Circulation Patterns
- Recreation & Athletic Facilities

Comprehensive solutions of the best and highest use of available land and assets were taken into consideration for each of the many areas of opportunities identified in the planning process.

The creation of this plan was based upon a broad range of input, detailed documentation, analysis, and inclusive dialogue with the various constituents and stakeholders that are affected by the plan. All referenced documentation and reports can be found in the appendix section of this document.



Harrisonburg is an independent city in the Shenandoah Valley region of Virginia in the United States. Its population was 48,907 at the 2010 census and 53,078 according to 2016 estimates. Harrisonburg is the county seat of Rockingham County and the core city of the Harrisonburg, Virginia Metropolitan Statistical Area, which has a 2016 estimated population of 132,822. The Bureau of Economic Analysis combines the city of Harrisonburg with Rockingham County for statistical purposes, while the U.S. Census Bureau treats Harrisonburg as an independent city for census tabulation. Harrisonburg is home to James Madison University and Eastern Mennonite University.

According to the United States Census Bureau, the city has a total area of 17.6 square miles (45.6 km²). 17.56 square miles (45.5 km²) of it is land and 0.04 square miles (0.1 km²) is water.

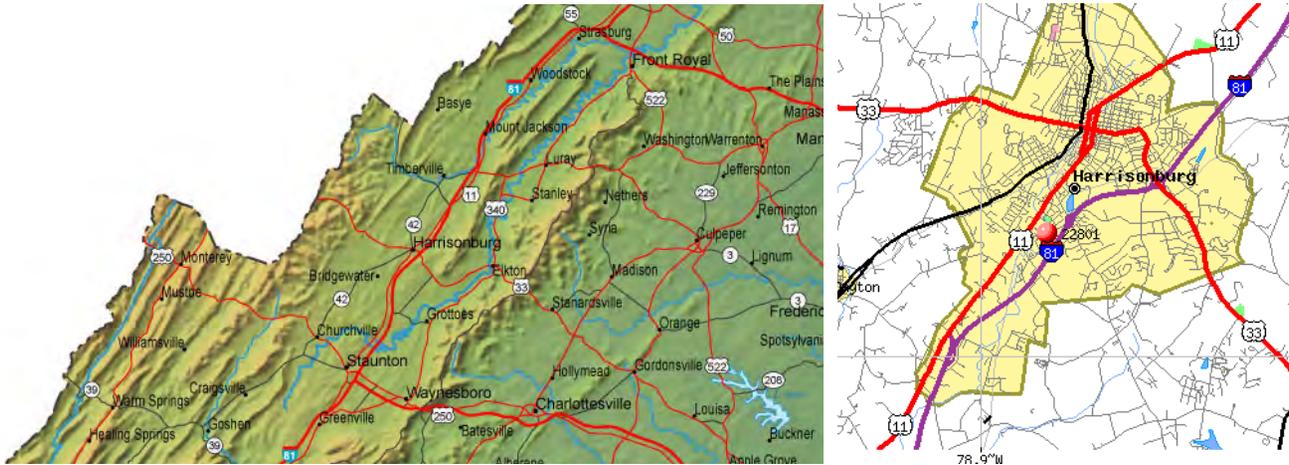


Figure 02 : Harrisonburg Map



Figure 01 : Virginia State Map

I OBJECTIVES, CONSTRAINTS & ASSUMPTIONS

PLANNING GOALS

The primary objectives surrounding this plan include:

- Assisting the University in translating its vision, mission, and strategic goals into a physical plan which identifies areas in which the University should focus its resources to meet future facilities requirements and student expectations.
- Provide guidance through the year 2027, but also identify early improvements to sustain the momentum of the University's recent growth and changes.
- Preservation of existing built and natural assets to the greatest extent possible.
- Present comprehensive solutions for the best and highest use of existing available land while identifying strategic opportunities for acquisition and disposition.
- Emphasize sustainability as an integral aspect of campus planning, design, and operations.
- Inform and include all stakeholders in the planning process.
- Develop a process that keeps the Campus Master Plan continually renewed and makes facilities planning an ongoing and integral part of University business.

PLANNING ASSUMPTIONS

The master planning process demands that key assumptions are identified and adopted to recognize probable future conditions and circumstances. Many can be derived from the University's strategic plan. The following is a summary of the key assumptions:

- Enrollment at James Madison University will grow to 23,471 full-time enrolled undergraduate and graduate students by 2027.
- 33% of all students will be housed in James Madison University-controlled housing.
- Increased usage of public transportation, including the development of an inner-campus shuttle, will be promoted as an alternative to personal vehicle usage

THE CAMPUS MASTER PLANNING PROCESS

II



CAMPUS MASTER PLAN UPDATE 2017

II MISSION STATEMENT & STRATEGIC PLAN

MISSION STATEMENT

We are a community committed to preparing students to be educated and enlightened citizens who lead productive and meaningful lives.

VALUES

- Academic Quality: We are dedicated to exemplary learning experiences because they are the essence of our mission.
- Community: We thrive when we collaborate, respect and serve others, and appreciate our interconnectedness.
- Diversity: We strive to be an inclusive community that values the richness of all individuals and perspectives.
- Excellence: We seek to be innovative and to perform at the highest levels.
- We pursue ethical reasoning because it is essential to meaningful citizenship.
- Student Focus: We provide experiences that challenge and support students.

James Madison University is a community of higher learning that reaches beyond the pursuit of instruction, developing well-rounded citizens who make a real difference in the world. We are continually building a culture marked by strong relationships, engagement, teaching excellence, ethical reasoning, discovery, and a commitment to the liberal arts and sciences. Students often describe their experience as one where we “hold the door open” for each other. We see this as both literal – reflecting a warm and welcoming community – and figurative, where we open opportunities for our students by fostering the cultivation of ideas in and beyond the classroom. We offer the benefits and resources of large scale and mass, while providing close relationships between students and faculty – the benefits of big with a small feel. We will be the national model of the engaged university because we believe engagement is a critical pathway to student enlightenment. As a reflection of our namesake, our most important intended outcome is to help create high-character citizen-leaders who contribute to improving the human condition.

VISION STATEMENT

To be the national model for the engaged university: engaged with ideas and the world.



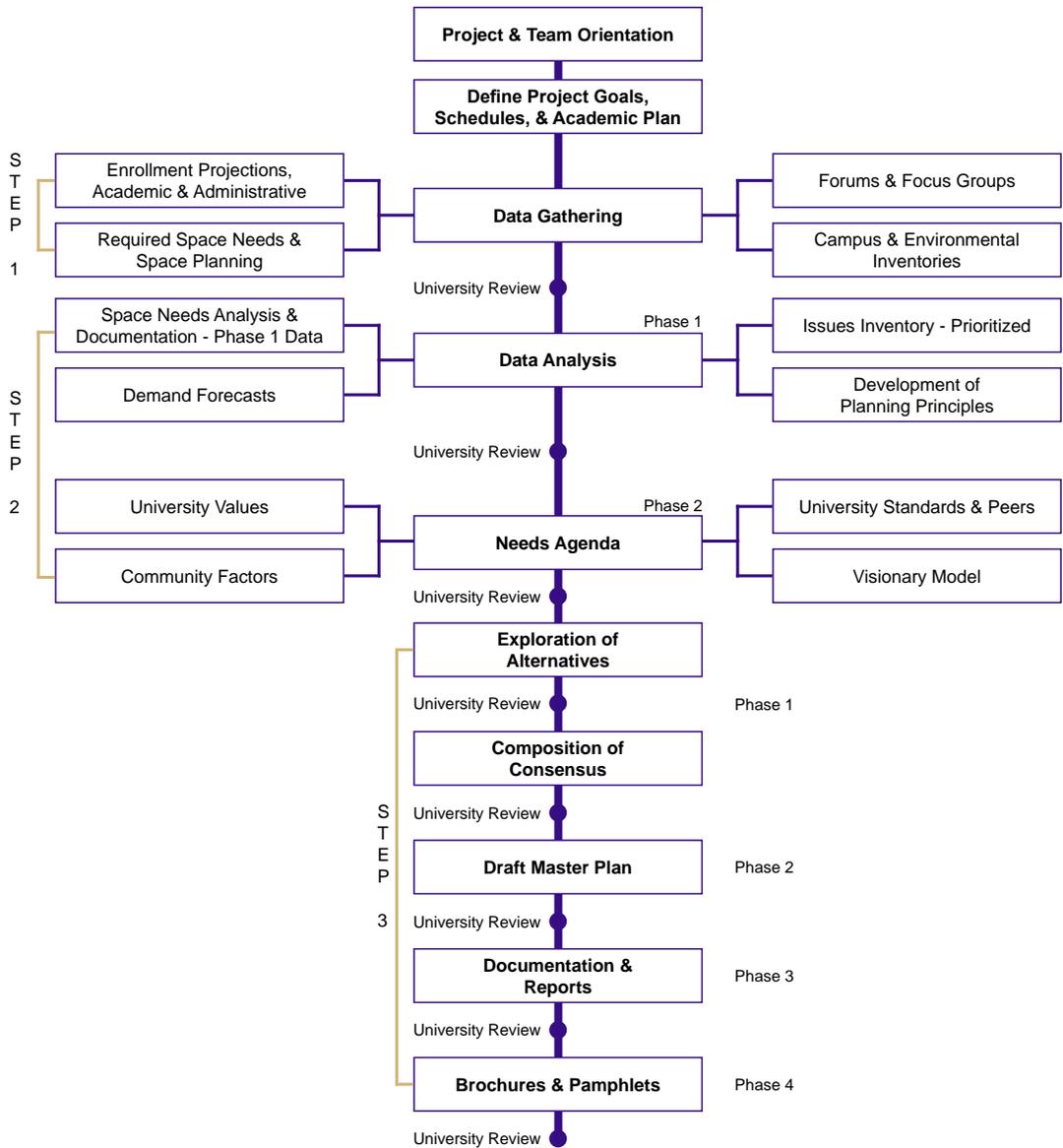


Figure 03 : Master Planning Process

WHAT IS A MASTER PLAN?

Master plans establish a physical vision for a campus, primarily through two dimensional plans identifying where development should occur, areas of open space, infrastructure, and other elements necessary to create a sustainable, enjoyable community that supports the academic mission of the institution. A comprehensive master plan enables a university to achieve integration and cohesiveness within a community. Several key elements in the development process must be carefully considered, including land use and adjacency, infrastructure provision, environmental protection, open space, landscaping, community facilities, water conservation, management, and sustainability. A successful plan guides an institution through its growth, thus contributing positively to the students, community, and broader society.

JMU'S PROCESS

The James Madison University master planning process serves as a basis for the development of a current and updated master plan, as well as the basis for the continual renewal of the master plan. Traditionally, campus and facilities planning was focused on individual projects, on an as-needed and sporadic basis.

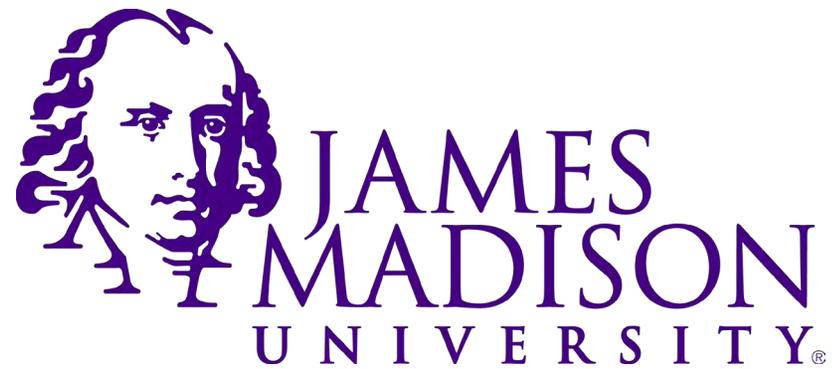
The process used to create the new master plan was designed to be participatory and collegial from start to finish. Representatives from each academic and administrative department were involved in an effort to develop a program for the campus plan, addressing a broad list of issues and concerns. Additional information was obtained from each group through several open forums with various members of city and county representatives.

The defined needs were then quantified and prioritized, and alternative approaches to address those needs were generated. The new Comprehensive Campus Master Plan is a synthesis of the best aspects of the many alternatives explored.

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CAMPUS HISTORY

III



CAMPUS MASTER PLAN UPDATE 2017

III OVERVIEW OF INSTITUTION

CAMPUS HISTORY

Since its establishment in 1908, James Madison University has grown from a small state normal and industrial school for women to today's coeducational comprehensive university with a fall 2017 head count enrollment of 22,667. The University was founded as the State Normal and Industrial School for Women at Harrisonburg, with Julian Ashby Burruss as its first president. The school opened its doors to its first student body in 1909 with an enrollment of 209 students and a faculty of 15. In 1914, the name of the school was changed to the State Normal School for Women at Harrisonburg. The school received authorization to award bachelor's degrees in 1916. During this initial period of development, Burruss' administration established the campus plan and constructed six buildings.

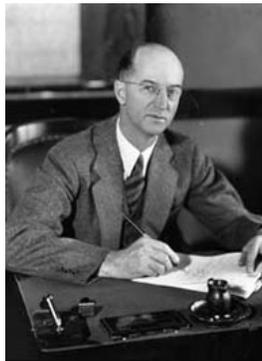
After Burruss resigned in 1919, Dr. Samuel Page Duke became the second president. Duke's administration erected nine major buildings. In 1924, the University became the State Teachers College at Harrisonburg, and continued under that name until 1938, when it was named Madison College in honor of James Madison, the fourth president of the United States. In 1946, the Duke administration admitted men as regular day students.

Following the retirement of Duke, Dr. G. Tyler Miller became the third president of the university in 1949, and remained until 1970. Miller's administration enlarged the campus by 240 acres and constructed 19 buildings. The administration also revamped the curriculum. In 1954, the expanding school received authority to grant master's degrees. The University became a coeducational institution in 1966.

Dr. Ronald E. Carrier became JMU's fourth president in 1971. His administration changed Madison College into a university. In 1977, the University adopted its current name, James Madison University. The Carrier administration nearly tripled the number of students and university faculty members, and constructed some 30 major campus buildings. Doctoral degrees were authorized in 1994. Under the leadership of Dr. Carrier, a master plan was developed for East Campus.

Dr. Linwood H. Rose was named JMU's fifth president in September, 1998. An expanding campus and 14 years of growth in academic programs have marked the Rose presidency. Rose conferred 56,893 degrees as president, a number that represents almost half of all of the degrees ever conferred at JMU since 1911. Under Dr. Rose, the number of master's degree and doctoral degree programs grew from 23 to 50 and 1 to 9 respectively. The 2008 Campus Master Plan was completed under Dr. Rose's leadership.

Mr. Jonathan R. Alger became JMU's sixth president on July 1, 2012. Mr. Alger plays a very public role in the life of JMU, as he represents JMU to the government of the Commonwealth of Virginia, presides at University events, serves as the principal voice of the institution, participates in fundraising, and stewards JMU's many relationships. His leadership involves developing and articulating a shared vision for the University, anticipating trends and issues affecting higher education, providing strategic institutional leadership and planning, and ensuring sound fiscal management. These responsibilities inform the president as he oversees an executive team and management structure to lead and manage education, student life, facilities and services, financial management, health and safety, planning, fundraising, constituent development and stewardship, and athletics.





Original Master Plan 1908, by Charles W. Robinson Figure 04

The Original Master Plan, designed by Charles W. Robinson in 1908, guided the University's growth through the 1950's. The plan developed what is today known as the Bluestone area of the campus. The historical quadrangle is headed by core academic buildings and flanked by a series of residence halls, a library, and dining hall.

As described in *Madison College, The First Fifty Years 1908-1958*, by Raymond C. Dingleline, Jr., the campus has from its inception been a planned physical element within the city of Harrisonburg.

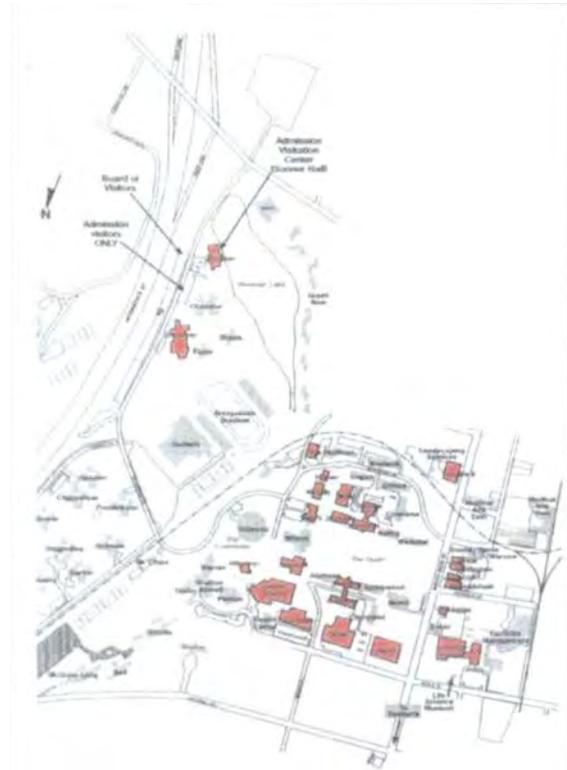
During the next two months, Burruss visited institutions in different states in search of ideas about buildings, organization, suitable faculty members, and other matters. These were weeks of study, thought, and planning. Then, in September, he was ready with detailed and comprehensive recommendations to the board. His report of 22 typewritten pages was accompanied by sketches of the grounds and buildings as they should appear when the school reached its maximum enrollment of 1,000. Altogether there would be about 40 buildings, including administration and academic buildings, residence halls, a gymnasium, a power house and a heating plant, a green house, and about 20 cottages. The drawings prepared by architect Charles M. Robinson of Richmond portrayed buildings of native-blue limestone with red, Spanish tile roofs. The principal structures were to be arranged around three sides of a quadrangle. Three academic buildings on the brow of the hill would face Main Street, about

1,100 feet away. The main academic and administration building would be in the center, with a science building on the south side, and an industrial arts building on the north. On either side of the quadrangle were planned two groups of six buildings - five residence halls and a library on one side and five residence halls and a dining hall on the other. All of the buildings were to be heated from a central heating plant, and were connected by a covered way so that the students would be protected from exposure to inclement weather. Behind the academic buildings, the plan called for a president's home and an "academic village" of about 20 cottages for faculty and students. Provision was made for plots of land for experimental farming, gardening, horticulture, floriculture, poultry raising, bee culture, dairying, and for recreation and physical education areas. The total cost of the construction was estimated at \$500,000, and the hope was to complete it in 10 years. The project was laid out on the 'unit plan', so that buildings could be added at different times and still hold true to the original



The College of Integrated Science and Technology Master Plan 1993, by Metcaf, Tobey & Partners Figure 05

Despite the magnitude of the project scale, this new portion of the campus is intended to be part of the existing James Madison University, not a separate, independent entity. It is, as is the bluestone segment of campus, a collection of buildings of similar massing and materials grouped around a common green space. While much more informal than the "quad", this meadow, in its own scale and context, provides a similar physical space that assumes as much identity as the buildings at its edges.



The JMU Renovation Master Plan, by DMJM Figure 06

As the new millennium emerged, a new planning cycle was initiated for the campus. While preceding decades had concentrated on new construction, the continued success of the University became dependent on the necessity to provide physical facilities for all of the academic disciplines. Changing paradigms combined and contrasted with buildings that had gone unchanged for half of a century. Many of these buildings were located in the Bluestone and Lakeside areas of campus.

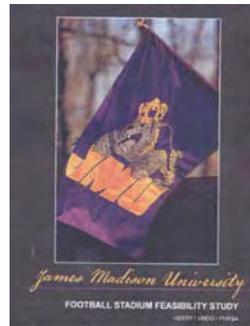
III OVERVIEW OF INSTITUTION

CAMPUS HISTORY



Cultural Arts Master Plan, by Hanbury Evans Newill Vlattas
Figure 07

The vision of this plan was to provide an identifiable holistic home for the performing and presentation arts, thus allowing the interactive learning of all of the associated facets of study. The research for this plan was successful in identifying a scheme which could indeed establish an arts center, while simultaneously rejuvenating an area of campus which had outlived its previous use.



Football Stadium Feasibility Study 1999, by Heery International
Figure 08

The evolution of sports facilities, on a campus that was nearly 100 years old, often causes specific conflicts, which can only be solved through holistic changes. Such was the case when the University began to address the need to expand the football stadium, and provide an academic support facility for the athletic programs. These issues, combined with the need to also construct a parking deck within the vicinity resulted in a campus wide analysis to discover where and how to best deal with these requirements. Heery International's sport facilities group succeeded in establishing the basis for the relocation of the running track, and the design for the Athletic Performance Center. In 2009, the football stadium feasibility study was conducted by Moseley Architects to explore alternative strategies for increasing the total seating capacity of the stadium to 40,000 seats.



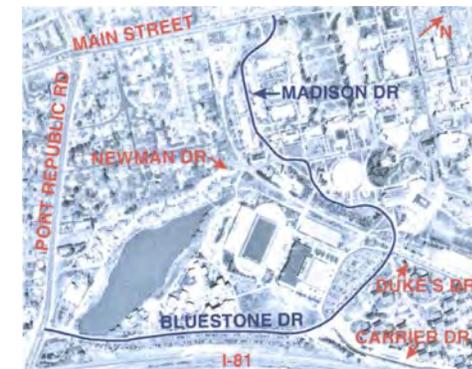
Edith J. Carrier Arboretum Master Plan 2000, by Marshall Tyler Raish
Figure 09

In the spring of 2000, a planning effort was undertaken to map the future of the Edith J. Carrier Arboretum. This 180-acre woodland is an integral part of the academic, recreational and ecological life of the University.



Pedestrian Traffic Study, by Anderson & Associates
Figure 10

The academic year of 1999-2000 was marred by several pedestrian related accidents on or near campus. In an effort to define the problems and to develop solutions, the administration contracted with a traffic-engineering firm to study the campus pedestrian traffic patterns and infrastructure.



Preliminary Engineering Report for Selected Campus Roadways 1997, by Anderson & Associates
Figure 11

This study was commissioned to assess the need for roadway modifications both on and adjacent to campus. Several projects have been accomplished; however, more work remains.



JMU Landscape Master Plan, James Madison University Facilities Management Figure 12

A plan was developed by the landscape professionals in JMU's facilities management for the design, maintenance, and management of the landscape on campus.



Health Center Study, by Smith Garrett Architects

The study examined the options for renovating, adding to, or replacing the Health Center. The report recommends demolition of the existing structure and replacing it on-site with a new facility.



Rose Library, by MMM Design

This study examined the need to expand the library functions on campus. The analysis included current use of Carrier Library, projected overall library space needs, and feasibility of constructing a new supplemental library building on the East Campus.



2002 Campus Master Plan, James Madison University Facilities Management Figure 13

As JMU was approaching its centennial, the need to reflect on both the past and to plan for the future was evident. This plan accumulated all of the previous plans and studies commissioned by the University, forming one document. Additionally, the plan also incorporated and defined over 30 characteristics and principles.



2002 Campus Master Plan Map Figure 14

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CONTEXTUAL CONDITIONS

IV



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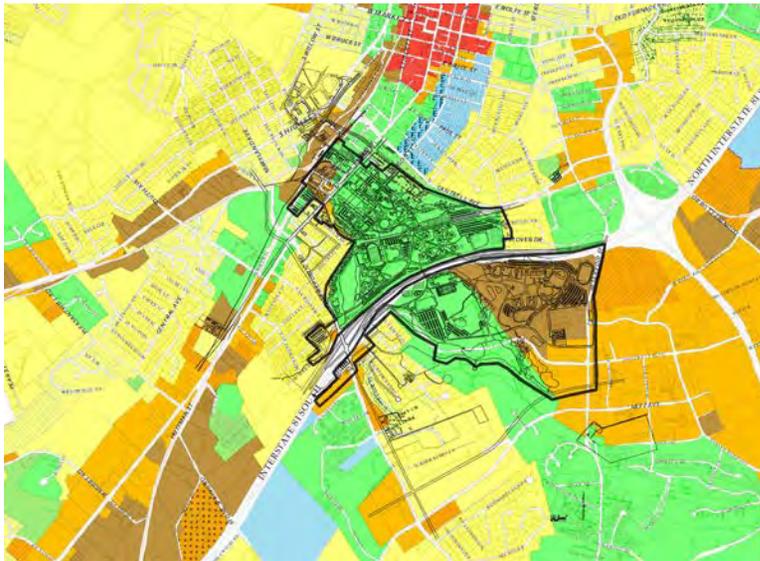
IV VICINITY IDENTIFICATION

Businesses found in Harrisonburg are ideally located to create and develop partnerships with JMU and or one of the eight other colleges and universities in the Shenandoah Valley region. The county's strategic location allows for easy access to both Richmond and Washington D.C. markets, which are only a few hours away.

Harrisonburg and the surrounding area offer an endless variety of natural and cultural attractions, historic sites, and recreational activities that are unsurpassed by larger metropolitan areas. Outdoor recreation, cultural events and amenities supported by local universities and strong non-profits, and a thriving downtown urban center, are all examples of the many qualities that make Harrisonburg an attractive place to live and receive an education.

James Madison University and other local universities sponsor lectures, concerts, art exhibits, and numerous athletic events which can be attended by the general public, many of which are free. Two planetariums, at Bridgewater College and James Madison University, are also open to the public throughout the year. James Madison University also offers programs and activities through their theaters and galleries.

Figure 15



JAMES MADISON UNIVERSITY VENUES

New Image and Grace Street Galleries both feature contemporary photography by regional, national, and international photographers. ArtWorks, also located on Grace Street, is a student-run gallery, exhibiting work by under-graduate and graduate students. The Sawhill Gallery at Duke Hall is a professional gallery featuring changing exhibitions of regional, national, and international significance. The Sculpture Invitational, an outdoor sculpture garden is also located just outside of Duke Hall. Lastly, the Forbes Center at James Madison University features five remarkable venues, each uniquely and acoustically designed to perfection.

INFLUENCE OF JMU

A major factor in the growth of the Harrisonburg area economy has been the transformation of James Madison University from a college of 5,000 students to a sprawling institution of more than 22,000 students. The city has adopted a downtown technology zone plan developed in an applied science class in 2005. The centerpiece is a technology center in a downtown building that Harrisonburg bought for \$1.5 million.

DEMOGRAPHICS AT A GLANCE

Harrisonburg-Rockingham MSA Population
1980 Census - 76,706
1990 Census - 88,189
2000 Census - 108,193
2010 Census - 125,231
2016 Estimate - 132,822
Sub-regional Population (2015 Estimates)
Harrisonburg - 53,078
Rockingham - 79,944
Average Household Size
1990 - 2.59 Persons
2000 - 2.58 Persons
2010 - 2.57 Persons
Income
Per Capita (2015), Harrisonburg MSA - \$23,481
Median Adjusted Gross Income for Married Couples (2015), Harrisonburg MSA - \$59,322

Figure 16

Sources: Weldon Cooper Center for Public Service and the U.S. Census Bureau

INFRASTRUCTURE AT A GLANCE

Government
Harrisonburg - 5 Member City Council
Rockingham - 5 Member Board of Supervisors
Incorporated Towns - Town Councils
Real Estate Tax
(per \$100 assessed value)
Harrisonburg - \$0.85
Rockingham - \$0.74
Bank Deposits
2014 Total - \$1.942 Billion
Communications
Fiber Optics, ISDN, and DSL Capability
Transportation
Road - Interstate 81
Rail - CSX, Norfolk Southern, Shenandoah, Valley Railroad, and Chesapeake Western
Air - Shenandoah Valley Regional Airport
Port - Hampton Roads (225 miles east) and Virginia Inland Port (68 miles north)

Sources: Local Governments and the Federal Deposit Insurance Corporation

COMMUNITY RELATIONS

Every college or university 'lives' within a surrounding community - the town to the institution's gown. Effective planning on any campus entails integrated planning with a variety of local organizations, governments, and business entities. The complexity and extent of planning efforts with local communities has created the need for ongoing attention on the part of campuses. Issues that a community relation's planner might face include campus expansion efforts, student behavior, shared municipal services (e.g., water, security, fire, etc.), public transportation, or shared facilities. The quality of life in surrounding areas can have a significant effect on recruitment and retention efforts, particularly for faculty and staff. Community relation's planning goes beyond creating a good public image. It requires campuses to consider how to be the best public citizens and partners of the communities in which they are located.

MISSION

Community Service-Learning is a partnership joining JMU students, faculty, staff, and the surrounding communities by identifying and coordinating intentional service opportunities to cultivate social responsibility and life-long learning, thereby fostering a generation of leaders committed to positive social change.

WHAT IS SERVICE-LEARNING?

A method of teaching where students learn and develop through active participation in thoughtfully organized community service. The service experience is integrated into and enhances the academic curriculum of the student. Service-Learning courses provide structured time for the students to reflect on the service experience as it relates to their coursework, personal development, and civic involvement. (Modified from the Corporation for National Service definition)

JMU SERVICE-LEARNING GOALS:

- To link academic learning objectives with intentional service experiences
- To promote personal growth and development
- To develop a life-long commitment to service and civic involvement

COMMUNITY PARTNERSHIPS

Community Service-Learning (CS-L) coordinates partnerships with over 75 community service agencies to help meet the needs of the community and improve the standards of life in the Shenandoah Valley. CS-L is an active member of community networks such as Healthy Community, Hispanic Services Council, Rockingham County Partners for Student Success, and Volunteer Forum. (Source: <http://www.jmu.edu/csl/about/about.html>)



IV 100 YEAR FLOODPLAIN

FLOODPLAIN

The majority of the JMU campus is not located within the floodplain, or Flood Hazard Area. Portions of the campus adjacent to Blacks Run and its tributaries fall within the limits defined as the FEMA floodway, 100-year floodplain, and 500-year floodplain. Construction within the 100-year floodplain and floodway has additional permitting requirements. The 100-year flood is also referred to as the 1% flood because there is a 1% chance that the flood will occur or be exceeded within a year. Location of the 100-year floodplain is shown on Figure 17.

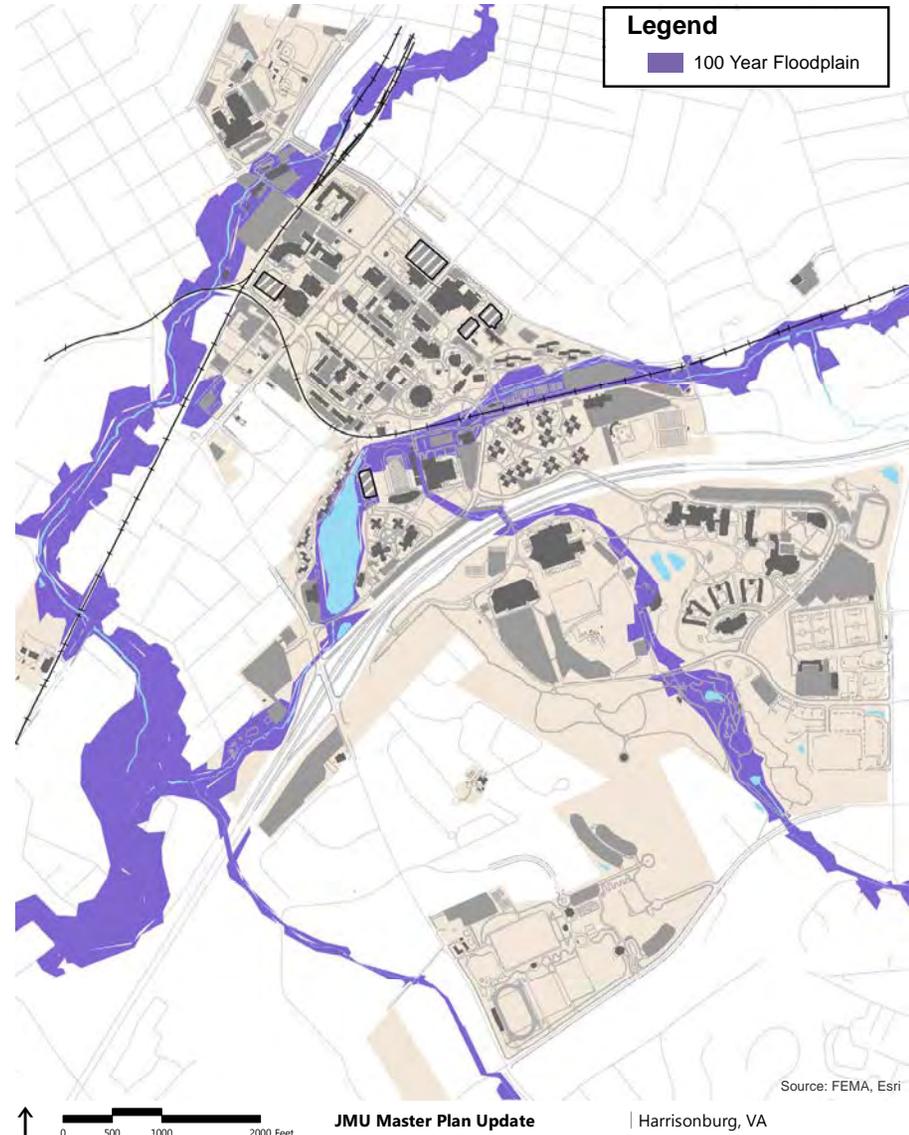


Figure17: FEMA 100-Year Floodplain

FEMA 100-Year Floodplain

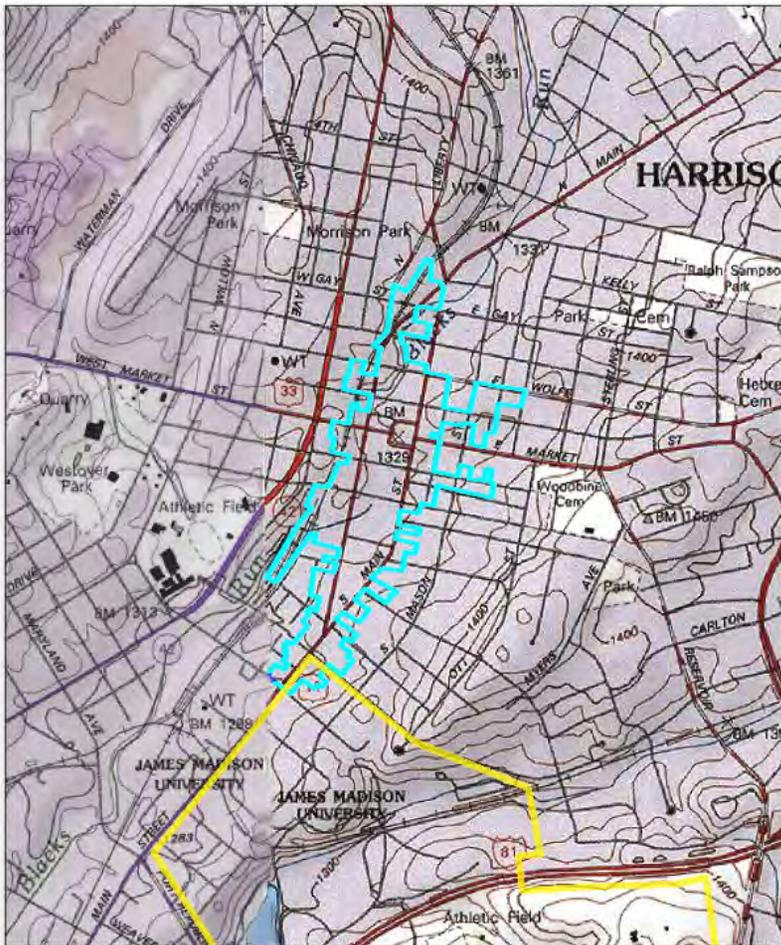
Source Info: JMU, VHB

Located in the central Shenandoah Valley region, Harrisonburg is bounded by the Blue Ridge Mountains, Shenandoah National Park, along with Massanutten Four Seasons Resort to the east, and the Allegheny Mountains to the west within the George Washington National Forest. Because Harrisonburg is within minutes to breathtaking outdoor recreation, major Civil War sites, historical attractions, artisan, and specialty shops, many people visit and vacation in the area.

Harrisonburg is surrounded by scenic Rockingham County and offers visitors a variety of cultural treats, unique flavors, and incredible outdoor recreation. The city was settled in 1737 by Thomas Harrison and grew up around several natural springs. Today, that history comes alive in Harrisonburg's historic downtown, established as one of Virginia's first Cultural Arts Districts .

The Harrisonburg Downtown Historic District is located in the city outlined in blue in Figure 18. The approximately 100-acre district embraces the historic commercial and institutional core of the city, which was established in 1779-80 as the seat of Rockingham County. The relatively level townsite is watered by Blacks Run, a tributary of the North River (North Fork of the Shenandoah River), and the area contained in the district lies between 1,300 feet and 1,350 feet above sea level. The principal axis of the district is Main Street, which runs approximately north-south through the district. Another principal thoroughfare is Liberty Street, which parallels Main Street, and together comprises the downtown section of U.S. Highway 11 (one-way northbound on Main, one-way southbound on Liberty). The principal cross axis is Market Street (U.S. Highway 33), which intersects with Main Street on the east side of Court Square.

The midsection of the district, centered on the Rockingham County Courthouse and Court Square, is densely built-up with commercial buildings and other building types dating primarily from the 1870s through the 1950s, with some earlier and later resources. South Main and South Liberty Streets, south of approximately Franklin Street, are principally residential in character, although this has begun to change at the south end of the district as dwellings have been converted to outpatient and office use by Rockingham Memorial Hospital. Historic industrial and warehouse buildings are concentrated at the north end of the district near West Gay Street and Noll Drive, and also along Chesapeake Avenue. The total number of resources is 212, of which 164 (77%) are contributing. Contributing resources are those that were in existence during the period of significance (1779-1955), and that possess sufficient integrity. (Source: www.dhr.virginia.gov)



115-0187 Harrisonburg Downtown (Court Square) Historic District
City of Harrisonburg, VA
Harrisonburg USGS Quadrangle

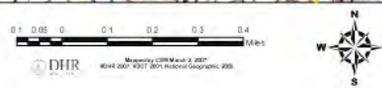
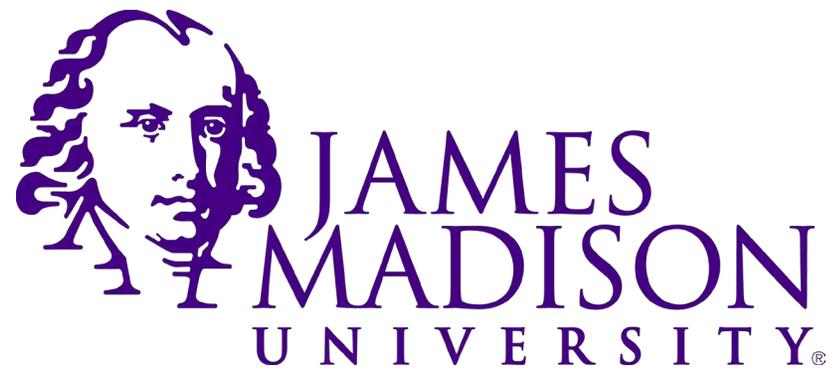


Figure 18 : Harrisonburg Downtown Historic District

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EXISTING CAMPUS CONDITIONS



CAMPUS MASTER PLAN UPDATE 2017

V CAMPUS GROUNDS

EXISTING CAMPUS CONDITIONS

James Madison University, located in Harrisonburg, Virginia, is a community of approximately 24,000 situated in the historic Shenandoah Valley. The University's campus consists of over 785 acres, which includes 31 acres located off-campus at the University Farm. There are 160 existing buildings on the campus as well as a 9.1-acre lake. University housing and dining is dispersed around the campus. The JMU terrain undulates across Interstate 81, where a pedestrian tunnel and automotive/pedestrian bridge connect each half of the campus.

- 1 BLUESTONE** - The historic area surrounding the original formal quadrangle and its smaller compatriot the quad in front of Cleveland Hall. This area consists of buildings constructed of native limestone, typically with red tile roofs and traditional ornamentation. Uses in this area are both academic and residential with a scattering of administrative and student services functions. The diversity of use in this area is one of its strong points, accounting for the vibrant activity in this area throughout several hours and sessions.
- 2 MID CAMPUS** - This area contains a substantial portion of the on-campus residential facilities, the football stadium, the College of Business, the parking deck, the bookstore, and Newman Lake. Buildings in this section of campus were typically constructed in the late sixties and early seventies.
- 3 EAST CAMPUS** - This part of campus contains academic buildings serving the College of Integrated Science and Engineering and the College of Science and Mathematics. In addition, this area currently houses three residence halls, a dining hall, the convocation center, the recreation center, the Edith Carrier Arboretum, Festival Conference and Student Center, Leeolou Alumni Center, a running track, three athletic fields, and several parking areas. The southern-most point of this area of campus is home to Sentara and UREC Parks. The athletics complex features a competition venue for men's and women's soccer, lacrosse, and track and field. Spaces used by university recreation (UREC) include sand volleyball courts, basketball courts, tennis courts, a disc golf course, and a 400' by 620' multipurpose synthetic turf field.
- 4 WEST CAMPUS** - This area is home to a variety of structures and uses. Buildings include the University Services building, the Forbes Center for the Performing Arts, Grace Street Housing, two parking decks, Memorial Hall, and Veterans Memorial Park.
- 5 NORTH CAMPUS** - This area of campus is home to Madison Hall, the Student Success and Services Center, Health and Behavioral Studies Building, three parking decks for the University, and the Hotel Madison and Conference Center.
- 6 UNIVERSITY FARM** - This element of the University is comprised of a thirty one acre farm along the Shenandoah River, an 1820 Greek Revival style house, a large pavilion, and an amphitheater.

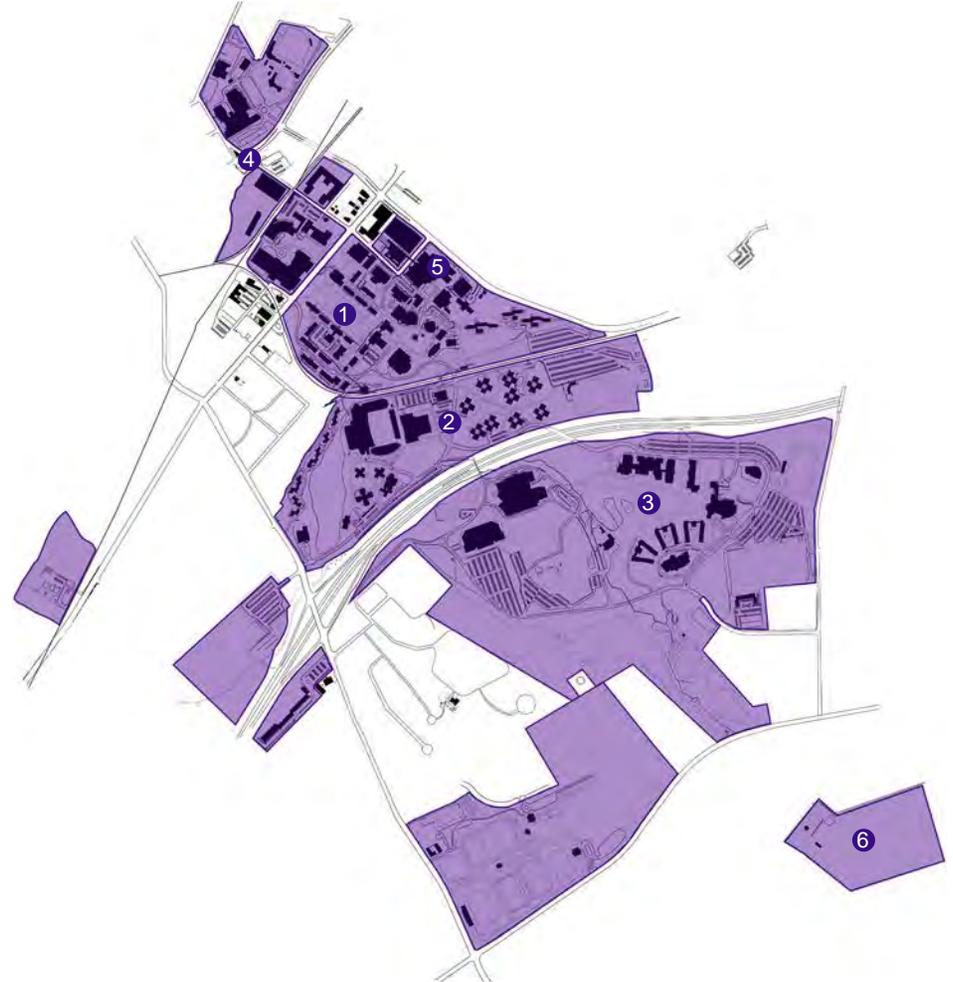


Figure 19: Campus Grounds

EXISTING CONDITIONS

- Existing Buildings
- Roadways and Sidewalks
- Surface Parking
- Programmed Green Space
- Unprogrammed Green Space

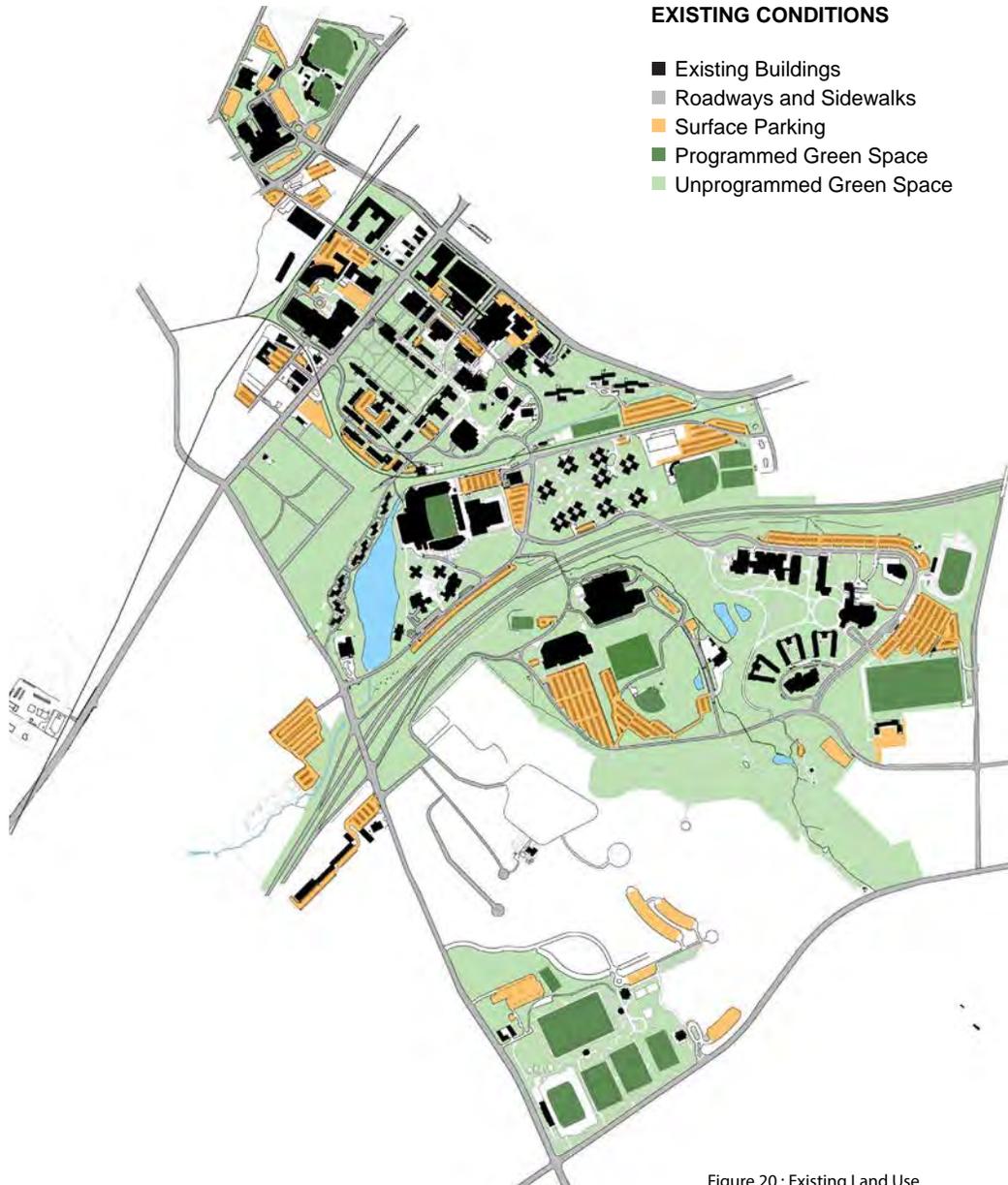


Figure 20 : Existing Land Use

James Madison University is a residential, 785-acre campus, of approximately 22,667 students and about 2,300 faculty and staff. The large campus is centralized geographically, but does have a number of facilities and properties not located on the main campus. There are 34 residence halls, 68 educational and administrative buildings, and 34 auxiliary facilities. The University has over 7 million square feet of total building space, and Residence Life houses approximately 6,500 students on campus each year.



V BUILDING ADJACENCY

EXISTING CAMPUS CONDITIONS

Building Adjacency diagrams describe organizing principles, program relationships, and connections that can help guide development within campus parameters.

This diagram illustrates that JMU's campus possesses an overall balanced distribution of buildings and functions, creating a relatively efficient adjacency.

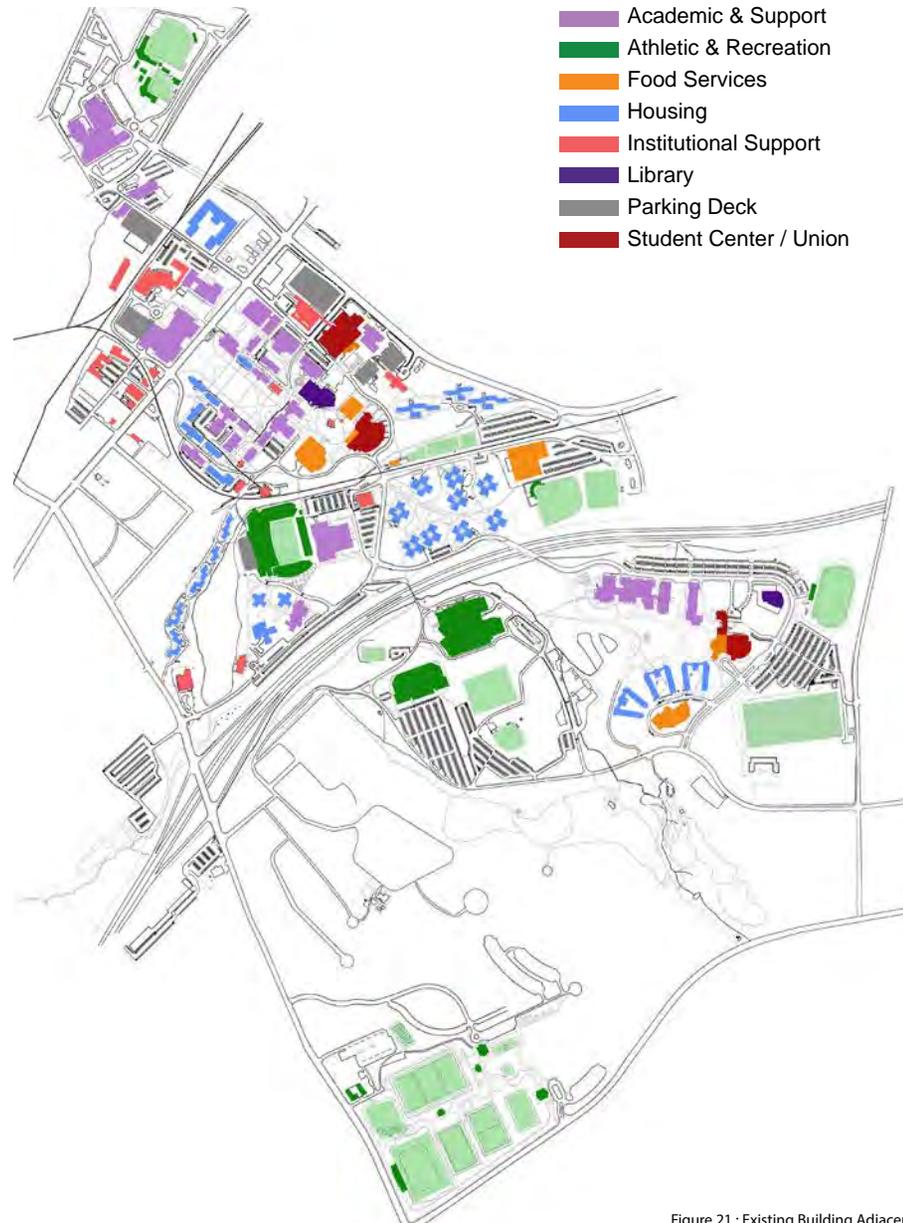
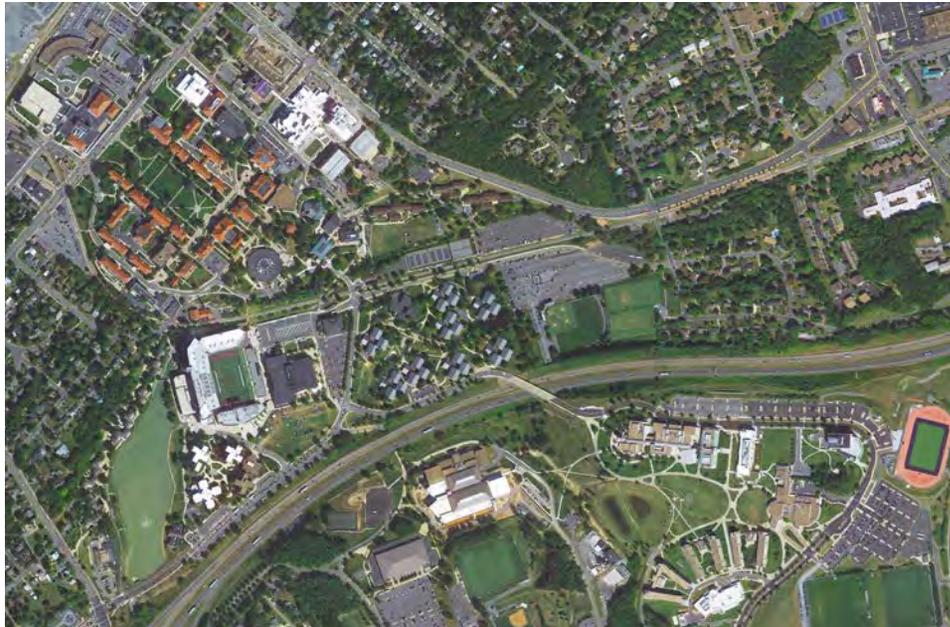


Figure 21 : Existing Building Adjacency



FCI Range & Condition Ratings

For each building, the Facility Condition Index (FCI) is developed which measures the relative amount of current requirements in the building. The total value of existing requirements is divided by the current replacement value of the building, resulting in the FCI. The higher the FCI, the poorer the condition of the facility. For example, if a building with a replacement value of \$1,000,000 has \$100,000 of existing requirements; the FCI is \$100,000/\$1,000,000 or 0.10. This principle can be expanded to cover groups of buildings or an entire campus. The FCI standards are:

Excellent	0.00 to 0.05
Good	0.05 to 0.10
Fair	0.10 to 0.15
Poor	Greater than 0.15

The FCI is a standard measure used throughout the country; it is recommended by both the National Association of College Business Officers (NACUBO) and the Association of Higher Education Facility Officers (APPA).

To determine the current replacement value of the building, VFA facility uses cost templates developed for each building construction type or use such as office, laboratory, healthcare, etc. These building replacement values are derived by VFA from historical and R.S. Means Data.

The University provided the following data describing the physical condition of buildings on campus. The campus buildings totaled 7,056,116 square feet, with a total current replacement value of \$1,552,904,860 and an overall facility condition index (FCI) of .15%.

V GREEN SPACES

EXISTING CAMPUS CONDITIONS

Open spaces on a campus define the character of the University and have been integrated within the JMU campus. Formal and informal green spaces are scattered throughout campus, and several athletic fields, gardens, interstitial areas, lawns, plazas and a 180-acre arboretum are available to students, faculty, and the surrounding community.

This master plan will continue the University's commitment to these outdoor places, and build upon the existing areas provided.



Figure 22 : Existing Open Green Spaces



REGIONAL COMMUTES

Figure 23 shows where employees live, and Figure 24 shows where commuting students who reside in off-campus apartments live. The figures show that the vast majority of employees and students live within Harrisonburg city limits. Students tend to live close to campus, with high concentrations to the south of campus, and along major roadway corridors where apartment complexes are located. Employees are also concentrated within Harrisonburg city limits, but a significant portion also live in outlying cities/towns, such as Staunton, Bridgewater, Elkton, Broadway, and other municipalities.

These trends are significant because they help explain commuting patterns and mode choices. Students who live close to campus or along major transportation corridors are able to walk or bike to campus, or use local transit service. Employees are more likely to drive to campus, as their commutes tend to be longer and schedules less flexible. Understanding commuting patterns and mode choices ties directly into planning for future parking needs and facilities for alternative transportation modes, such as transit and bicycle. These systems are discussed in more detail in subsequent sections.

ON CAMPUS

Figure 25 depicts the various routes that provide access to JMU's campus. A system of gates has been constructed since the 2008 Master Plan in order to close off the center of campus to every-day vehicular traffic. These gates allow the center of campus to be more pedestrian friendly, while providing easier access for transit service and emergency vehicles. The gates are located on Bluestone Drive, Duke Drive, Madison Drive, and two locations off of East Grace Street adjacent to Alumnae Hall, and are open to private vehicle traffic after 7pm Monday-Thursday, after 1pm on Fridays, and during the weekends. Carrier Drive and University Boulevard, coupled with city streets along the edge of campus, provide direct vehicular access to most of campus.

Annual Average Daily Traffic (AADT) values for various campus roads are shown on Figure 4 of the VHB Master Plan document referenced in the Appendix of this Campus Master Plan Update. Carrier Drive, Port Republic Road, Reservoir Street, and South Main Street have the highest AADT values and, therefore, the highest amount of vehicular traffic throughout the day. These corridors are used by most drivers to access the campus.

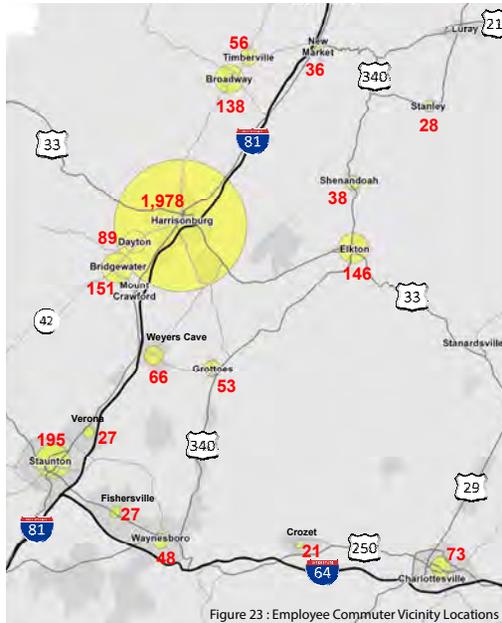


Figure 23 : Employee Commuter Vicinity Locations

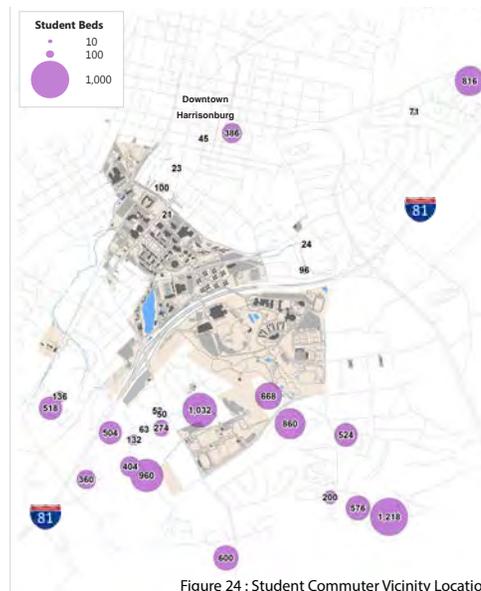


Figure 24 : Student Commuter Vicinity Locations

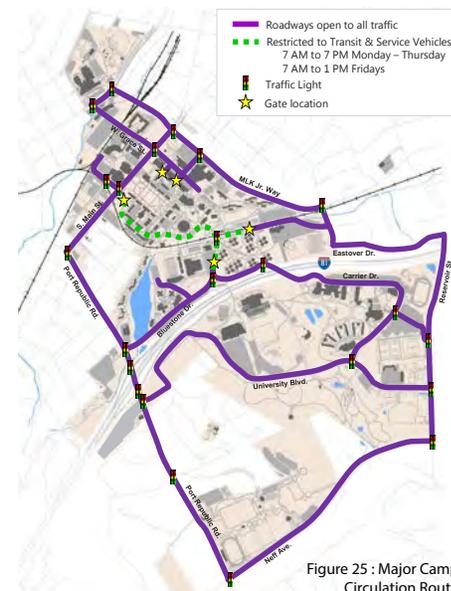


Figure 25 : Major Campus Circulation Routes

TRANSIT

Transit has become an integral part of JMU's campus life. Many students and faculty use transit service provided by the Harrisonburg Department of Public Transportation (HDPT) to travel to and from campus. With the many different transit routes traveling through campus and the City of Harrisonburg, approximately 19 campus and City routes serve JMU on a typical weekday during the Fall and Spring semesters. There are two transfer stations at Godwin and Memorial Halls on campus where students can change between City and campus buses. Different cellphone apps, such as NextBus and JMU's Bus Finder, assist with tracking bus routes and arrival times. JMU students have accounted for an overwhelming 89% of HDPT's ridership since the start of the 2009 fiscal year, most likely a result of the student fee entitling the students to ride the busses for free, and the large area serviced by the network. The current transit routes are accurate as of August 2016. Fall 2016 campus-serving transit routes, as well as the various stops and transfer stations throughout the JMU campus, are shown on Figure 26.

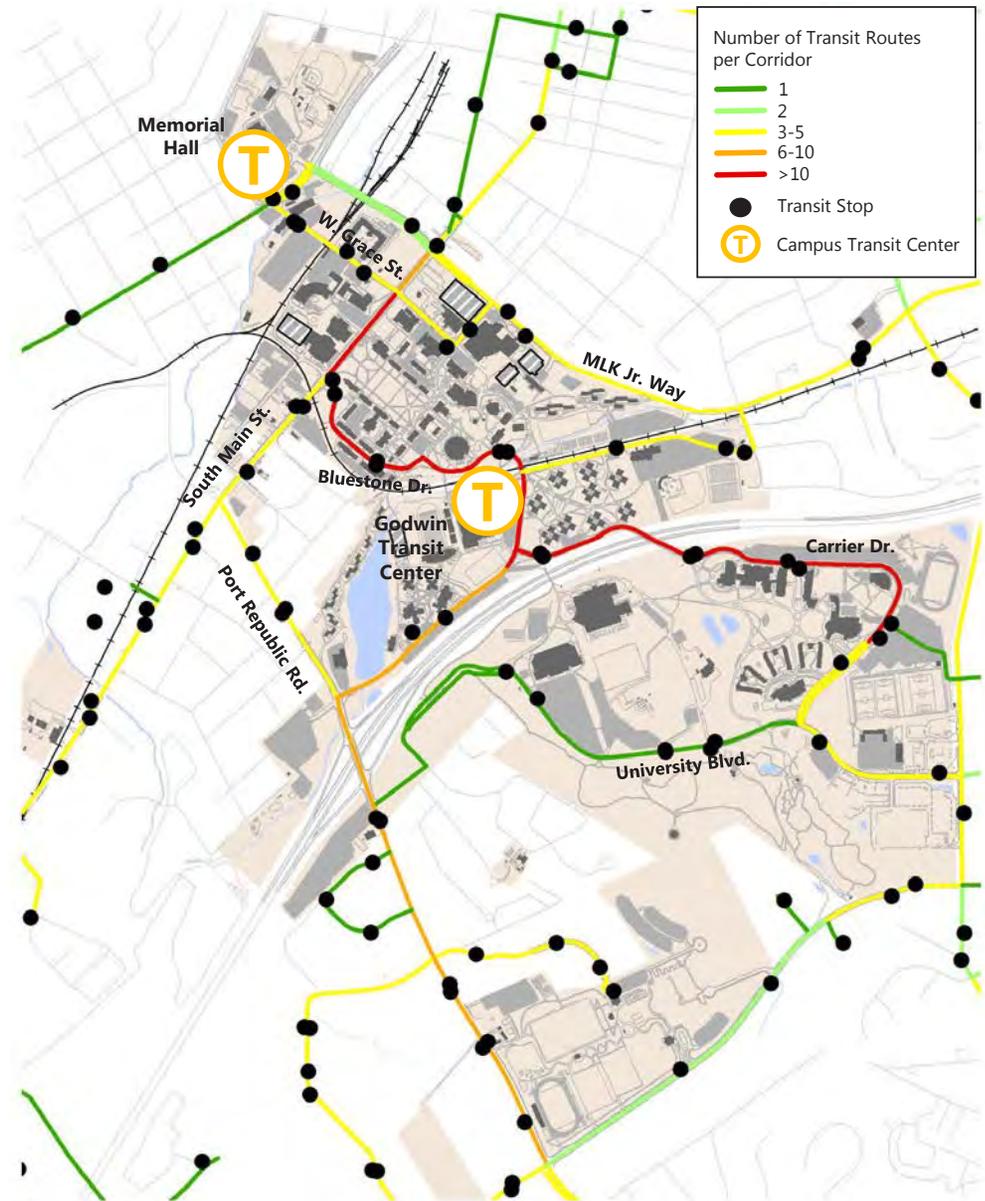
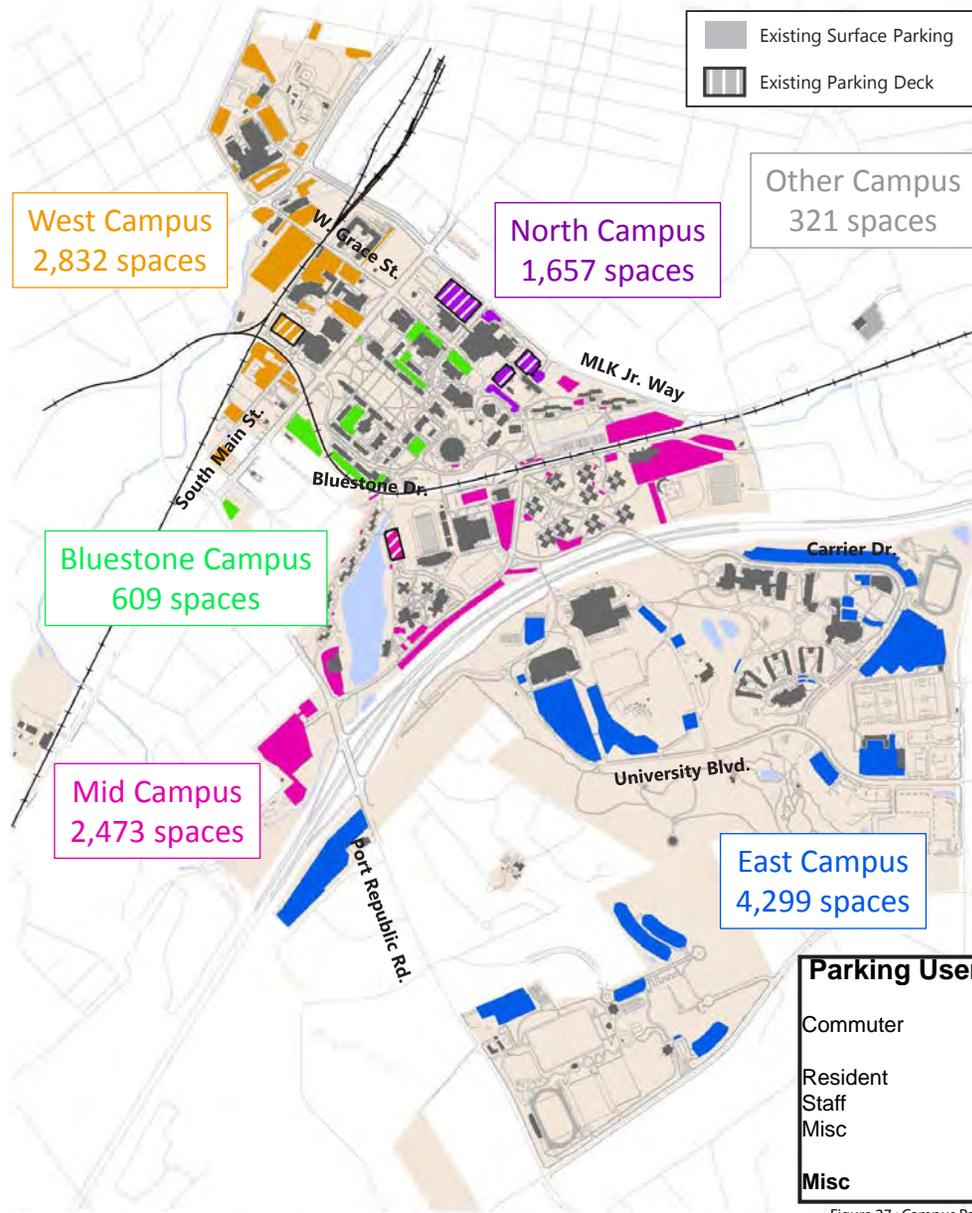


Figure 26 : Transit Map



EXISTING PARKING

There are over 12,000 parking spaces on the JMU campus (Figure 27). There are four parking decks on campus in addition to the Mason Street Parking Deck which was recently opened in August 2016, adding 1,000 spaces of structured parking. However, the majority of parking spaces are in surface lots spread across campus. With over 21,000 students, the parking space to student ratio is approximately 0.55, a ratio on par with universities of similar size and settings. In general, there are sufficient spaces for those who desire parking. However, JMU shares a parking problem common to most universities: there is enough parking supply to meet demand, but there is a spatial mismatch between available parking and campus destinations. Many of the spaces, especially for resident students and commuters, are on the periphery of campus helping to ease internal campus congestion, and to keep the center of campus open to pedestrian and bike traffic. Figure 27 and table 33.1 summarize the breakdown of parking spaces by campus location and user.

Table 33.1: Parking Breakdown

Figure 27 : Campus Parking Counts

V HOUSING

EXISTING CAMPUS CONDITIONS

James Madison University is considered a residential campus despite the fact that most of the students actually reside off-campus. Around 6,500 students live on-campus in 33 buildings that represent a variety of residential configurations. Typically, all bed spaces on campus are occupied, and frequently students are tripled early in the fall semester until spaces are made available through attrition. Demand is currently greater than capacity despite an abundance of bed spaces off-campus.



Figure 28 : Existing Campus Housing Locations

A number of sports and recreational facilities are provided throughout the campus grounds. Spaces found within the campus boundaries range from formal fields, courts, and venues, to informal, active, and relaxed areas offering something for everyone.

- Robert & Frances Plecker Athletic Performance Center
- Bridgeforth Stadium
- Memorial Hall Site
- University Recreation Center
- Convocation Center
- Field Hockey/Track & Field Complex
- Lacrosse/Soccer Complex
- Softball Complex
- Long Field / Mauck Stadium
- Sinclair Gymnasium & Savage Natatorium
- Sentara Park

More than 500 athletes compete in 7 men's and 11 women's sports including archery, baseball, basketball, cross-country/track, fencing, field hockey, football, golf, gymnastics, lacrosse, soccer, softball, swimming/diving, tennis, volleyball, and wrestling. The varsity football team won the 2016 NCAA Division I Football Championship, the second title in program history. The University also maintains an active Recreation Program for students, that includes over 30 sport clubs.



Figure 29 : Existing Athletic Facility Locations



The campus-wide signage system currently in place at the University is in need of updating. As the campus has evolved over the years, efforts have been made to maintain a cohesive comprehensive system. There are several prescriptive signage guidelines currently in place, and can be referenced in the Campus Guidelines and Standards section of this document. This master plan will make recommendations on how the signage system and guidelines should be updated and improved upon.

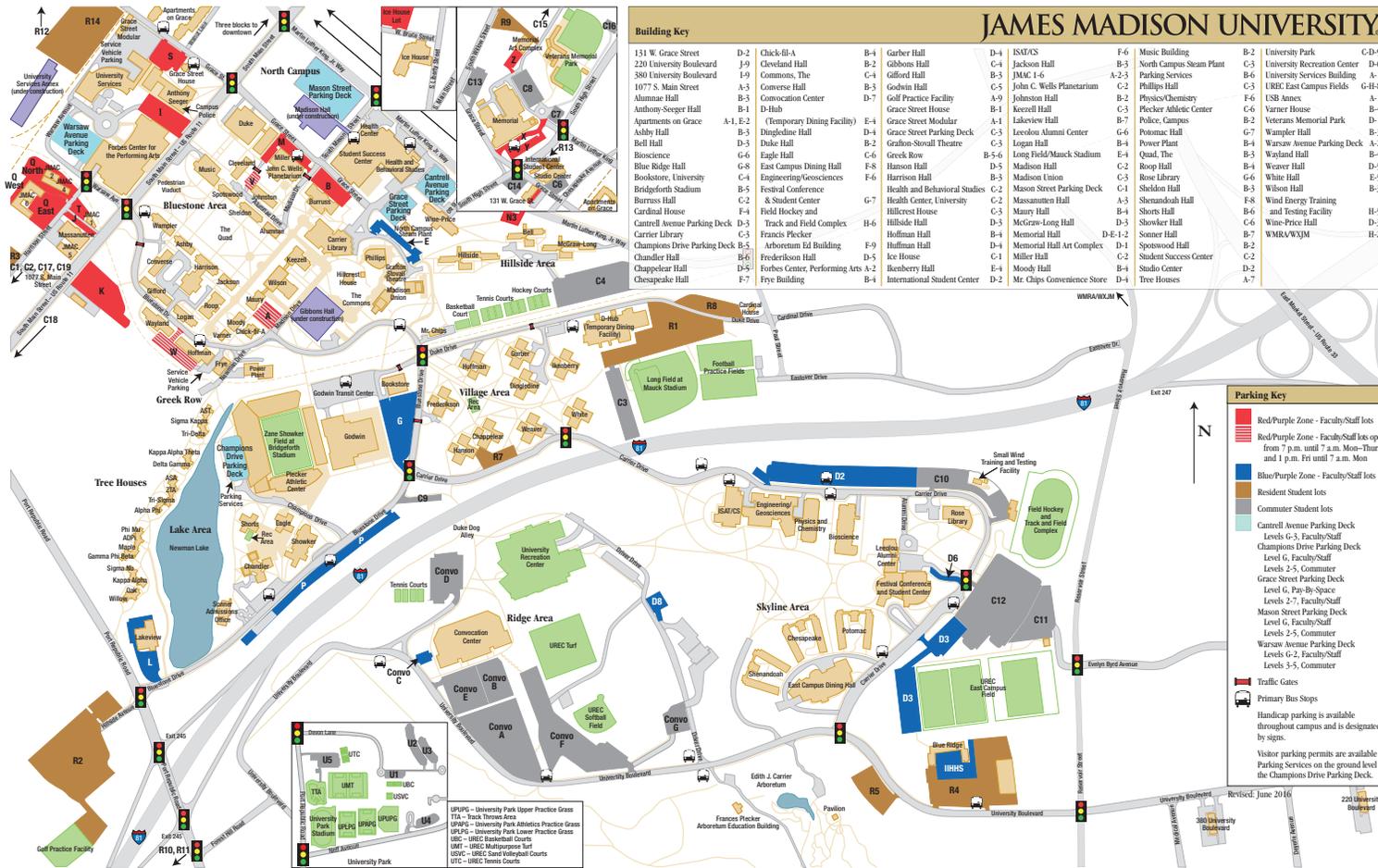


Figure 30A : Campus Wayfinding Map

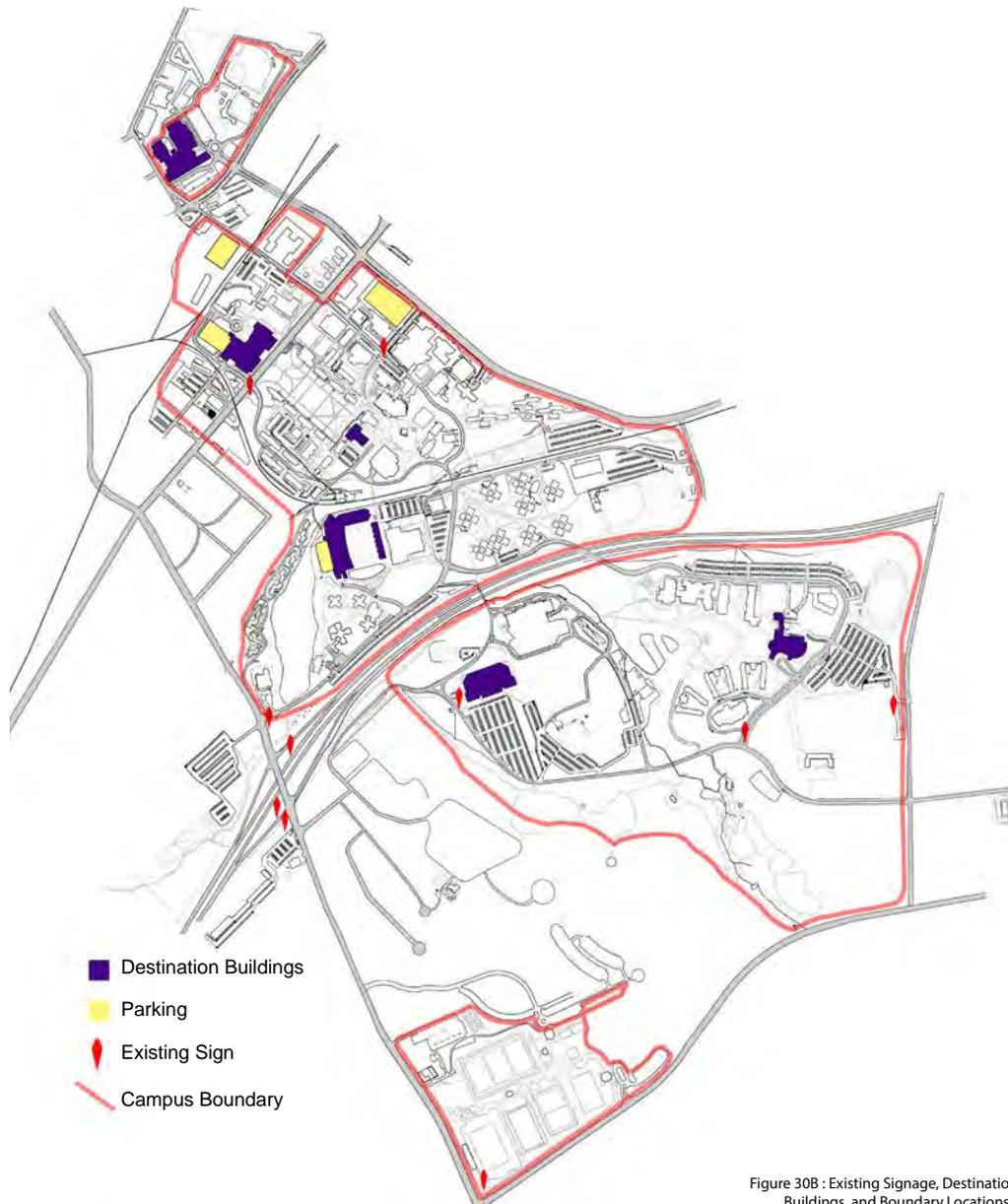


Figure 30B : Existing Signage, Destination Buildings, and Boundary Locations

LANDSCAPING

Open spaces and landscaping play an important role in defining an institution's character. The existing campus grounds are well maintained, with a wide variety of species. The master plan will furnish a comprehensive campus planting list and incorporate standards into the campus design guidelines.

ENTRANCES & GATEWAYS

Figure #31 illustrates the locations of destination buildings, major parking garages, and existing signs, all contributing to campus entrances and gateways. One of the primary considerations of this plan will focus on further defining these areas.

BOUNDARIES

Existing campus boundaries are relatively well defined through natural topography, streets, and landscaping. Areas available for improved definition include the western area of the Bluestone campus, the North campus, and the West campus.

The majority of buildings located on the James Madison University campus are connected to a centralized steam generation and distribution system to support the heating and process loads of the facilities. There are two steam generation plants located on the campus:

- West Campus Power Plant (WCPP)
- East Campus Power Plant (ECP)

The West Campus Power Plant (WCPP) utilizes natural gas as a primary fuel, and is owned and operated by the University. The plant is located in the northwest region of the campus near the Chesapeake Western Railway and Bridgeforth Stadium. This plant was upgraded in January 2012 with two natural gas-fired boilers, capable of providing 200,000 pph (pounds per hour) of total steam capacity.

The East Campus Power Plant (ECP), located in the northern part of this area of campus on Driver Drive, was built in 1982 and updated in 1997. This facility was formerly owned by the City of Harrisonburg and is now owned and operated by JMU. This plant includes two natural gas-fired boilers, capable of providing 70,000 pph of total steam capacity.

The WCPP and ECP plants are interconnected via an underground piping network, enabling sufficient heating supply to the existing University buildings.

The “Campus Wide Steam Survey”, completed by Wiley & Wilson in 2006, evaluated the JMU steam system and proposed recommendations to ensure an adequate level of reliable heating capacity. The report provided a strategic plan to upgrade the steam generation system to support the projected 80% increase in steam load associated with the future campus growth identified at the time of study.

The previously noted upgrades initiated in the JMU steam plant are based upon the recommendation of the 2006 study, and, when complete, will increase the total campus steam capacity to 270,000 pph (including ECP) with a resulting firm capacity of 190,000 pph. The “firm capacity” is defined as the reliable system output without the availability of the single largest unit. It is typical for a centralized heating system to maintain a firm capacity greater than the peak load.

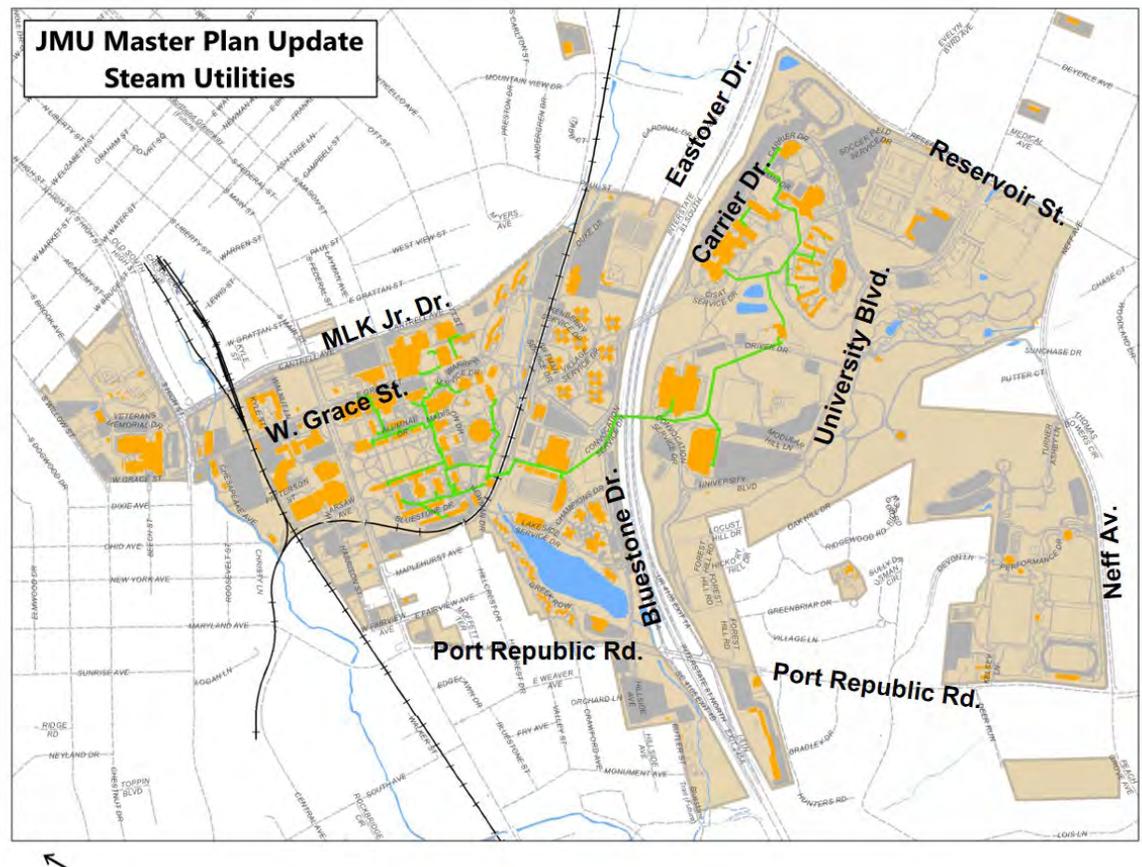


Figure 31 : Existing Campus Steam Lines

The two steam plants currently located on the James Madison University campus utilize natural gas as the primary fuel source and fuel oil for the back-up/ secondary fuel source.

Heating Plant	Primary Fuel	Secondary Fuel
WCPP	Natural Gas	Fuel Oil/ Bio-Diesel
ECPP	Natural Gas	Fuel Oil

James Madison University relies on natural gas as its main source of fuel. Natural gas is readily available, and serves to be a reliable source of energy in the area.

The University purchases natural gas at an “interruptible” rate, which means that the utility may interrupt the gas supply during high demand periods. During these potential interruption periods, the University relies upon the on-site storage of fuel oil and bio-diesel to generate steam. The ability to sustain short-term, temporary interruptions results in a significantly lower natural gas rate. This practice is common among central heating systems.

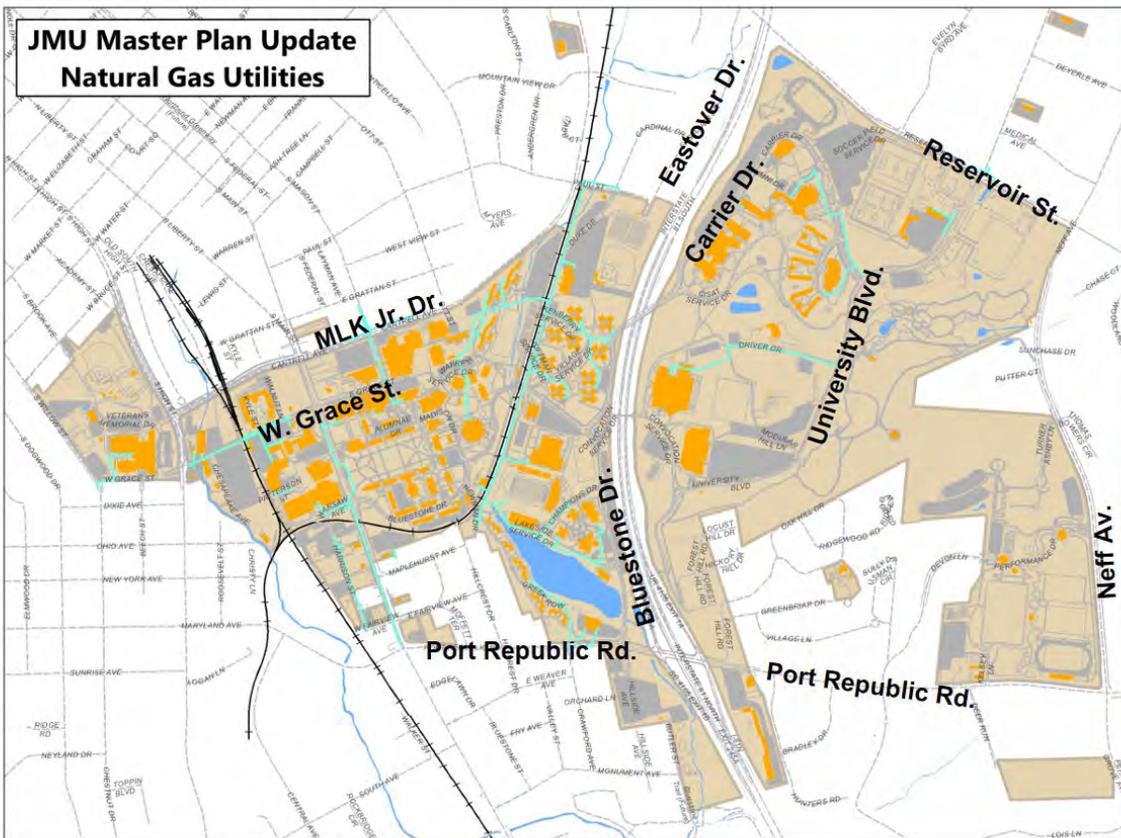


Figure 32 : Existing Campus Natural Gas Lines

Nearly all of the existing buildings on the James Madison University campus include some form of a building air conditioning system. The majority of these facilities have individual refrigerant units dedicated to serving the associated building. However, the buildings located on the East Campus utilize a district cooling system that distributes chilled water to each building to serve the facility's air conditioning needs. The chilled water is generated centrally within the East Campus Power Plant (ECPP) by three 1,000-ton steam turbine driven refrigeration units (chillers), and one 1500-ton electric driven refrigeration unit (chiller). Underground piping is used to distribute the chilled water to the following buildings:

- ISAT/CS
- ENGEO
- Physics/Chemistry
- Bioscience
- Potomac Hall
- Chesapeake Hall
- Festival Conference and Student Center
- Rose Library
- Leeolou Alumni Center
- UREC

Some of the advantages of the district cooling system are:

- A fewer number of machines in a single location reduces maintenance
- Greater system efficiency at peak and part-load conditions
- Eliminates the need for building cooling towers or air-cooled chillers/ condensing units (outdoor equipment) and associated outdoor noise
- A central location facilitates equipment renewal and extends system life
- To achieve these advantages, a greater initial capital investment was required to install the distribution piping and a centralized chiller plant. The economic viability of a district cooling system will depend upon the following:
 - The concentration of cooling loads (the amount of load in a specific region)
 - The feasibility of locating a plant to house the chillers,
 - The cost of the distribution piping
 - The energy rates that will impact annual savings.

An objective in building design is to minimize the water consumption as much as possible. Each design project should be evaluated to determine the potential water demand in order to design the system to have enough for the building's use. Water main sizes in the Bluestone campus are undersized to account for both domestic and fire flows for most newly constructed projects. Also, the Bluestone campus currently utilizes two master meters in order to monitor water usage, as opposed to other sections of campus which meter each building directly. One of the master meters is located at the intersection of Port Republic Road and Bluestone Drive, and the other master meter is located adjacent to Hillside Hill. The University's potable water system has not been modeled and analyzed for a complete campus water demand analysis. The existing potable water system is shown on Figure 33.

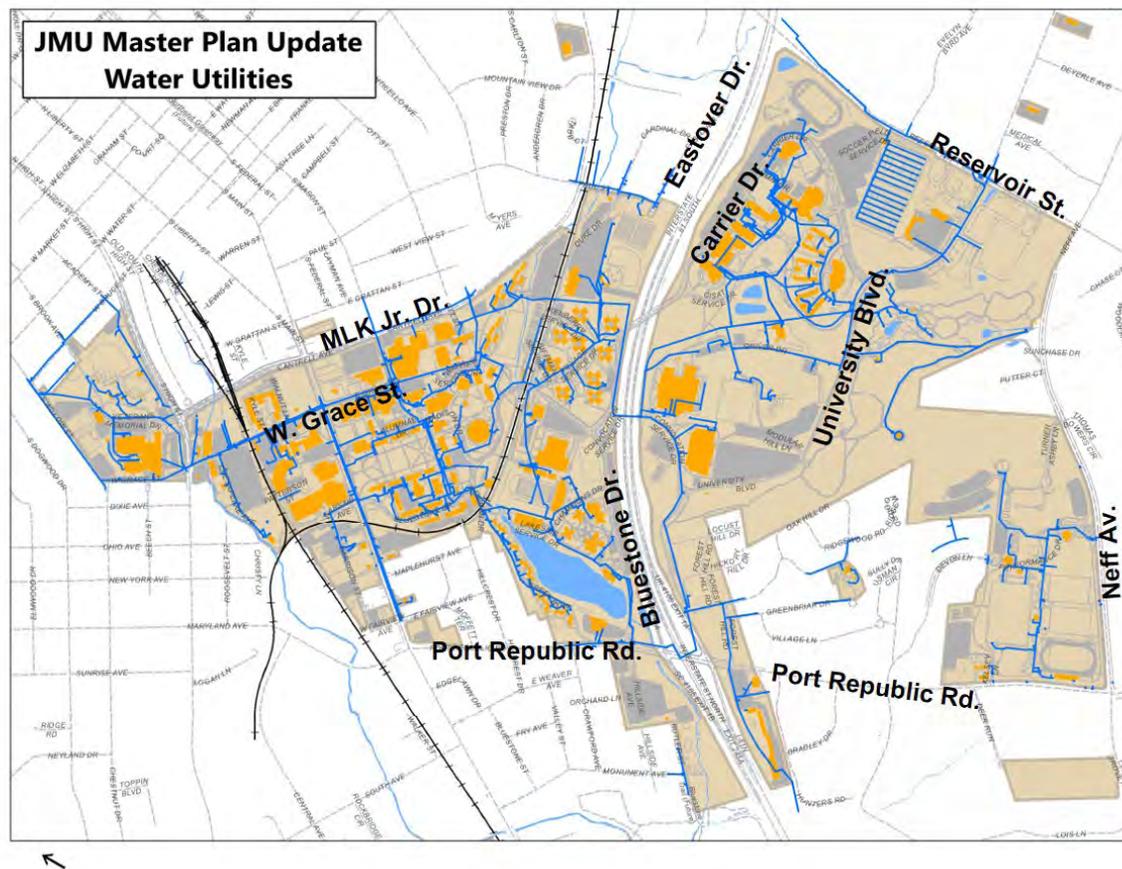


Figure 33 : Existing Campus Potable Water Lines

V SANITARY SEWER

EXISTING CAMPUS CONDITIONS

JMU maintains a private sanitary sewer collection system, which discharges via gravity piping into the City of Harrisonburg's system. These sanitary flows ultimately discharge into the Harrisonburg Rockingham Regional Sewer Authority (HRRSA) Treatment Plant, located at Mount Crawford. During the 2008 Master Plan planning process, the plant was undergoing an upgrade, which increased the capacity of the plant to ultimately allow more flow from the expanding campus into the City system. The majority of the sanitary pipes located throughout the Bluestone Campus are made of terracotta, a material no longer being utilized for sanitary pipe systems. Multiple projects at JMU have had difficulty with terracotta pipes crumbling while connecting the new sanitary pipe to the existing. An 8" DI sanitary sewer main was installed in 2014, adjacent to the Field Hockey and Track and Field Complex, to accompany development of a future Auxiliary Rec Building, according to the previous 2008 Master Plan. The main contains capacity for future development in the East campus. Harrisonburg continues to monitor their system, and rehabilitates aspects of the system when needed. The existing sanitary sewer network is shown on Figure 34.

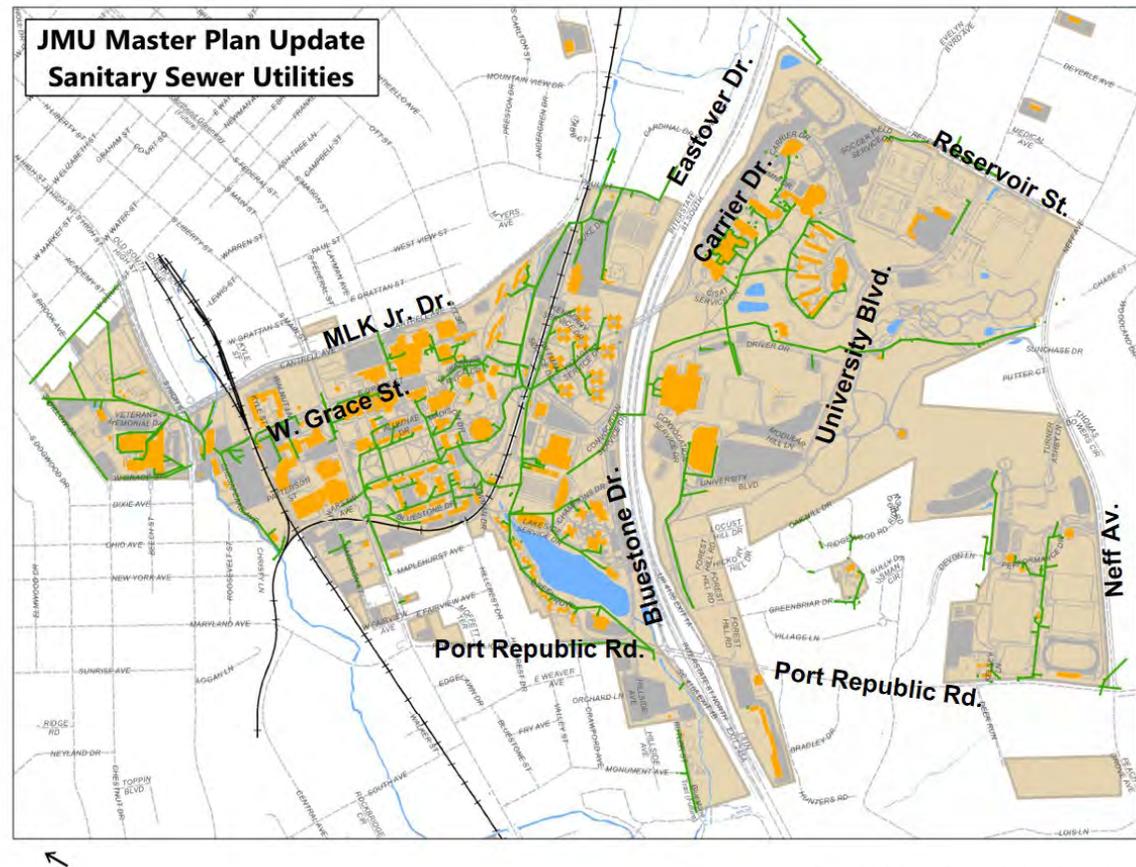


Figure 34 : Existing Campus Sanitary Sewer Lines

The existing storm sewer network has been evaluated, extended, and upgraded as necessary for construction projects. The increased number of stormwater facilities constructed since the 2013 plan has substantially increased the number of storm sewer pipes. The existing storm sewer network is shown on Figure 35.

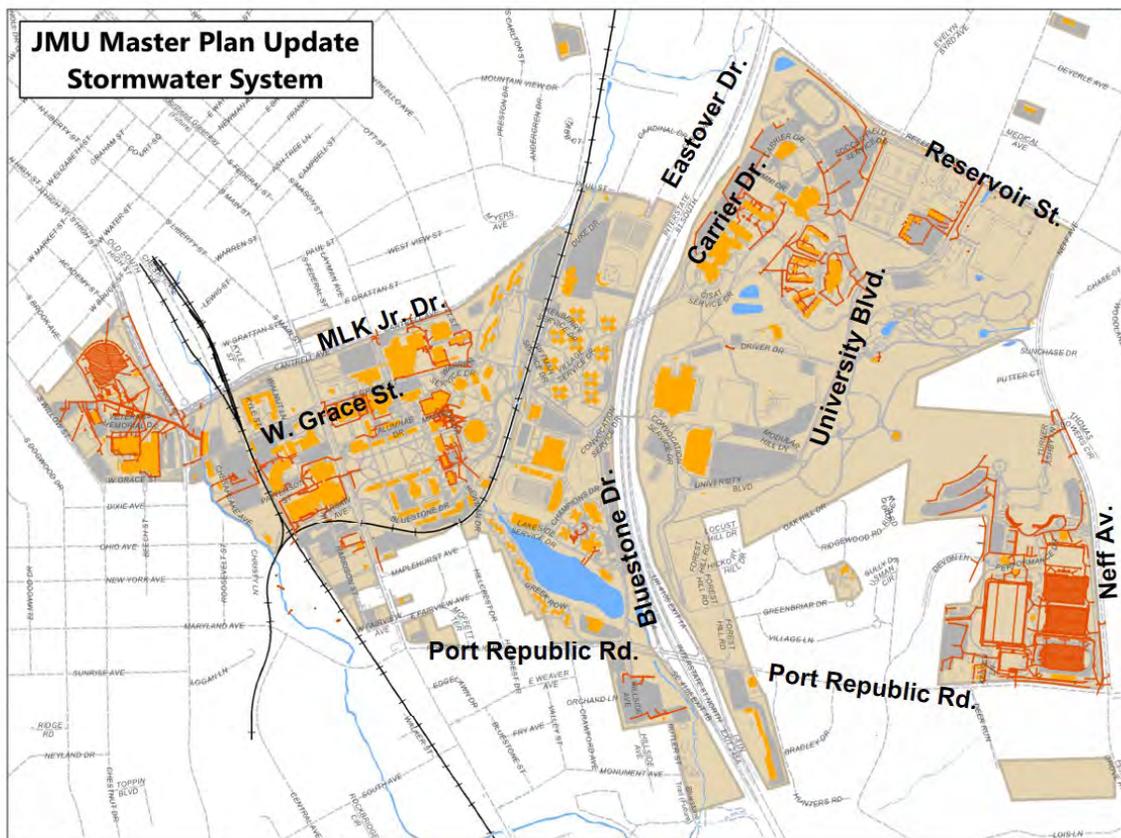


Figure 35 : Existing Campus Stormwater System

V ELECTRICAL DISTRIBUTION

EXISTING CAMPUS CONDITIONS

Electric power is provided to the James Madison University campus by the Harrisonburg Electric Company, which is supplied power by Virginia Dominion Power Company. The University owns the transformers at each building, while the Harrisonburg Electric Company owns the distribution lines on the campus. Each building currently receives two electric feeds to provide a reasonable level of redundancy. The recently completed Student Success Center currently includes a separate dedicated feed from the Harrisonburg Electric Company.

The University is billed power mainly based upon primary metering, which totalizes power usage at the higher (or primary) voltage. In general, campus-type facilities can aggregate their respective electric load profile through primary metering, can minimize the “billed” peak load, and may yield greater purchasing power based upon higher volume.

Existing Electrical System

- Existing Campus served by Harrisonburg Electric (from Dominion Power)
- JMU owns the transformers
- Harrisonburg Electric owns the distribution
- Two feeds to every building
- One switch station at plant
- One switch station on East Campus
- Student Success Center has its own service
- Total Electric Load ~ 8,000 kW

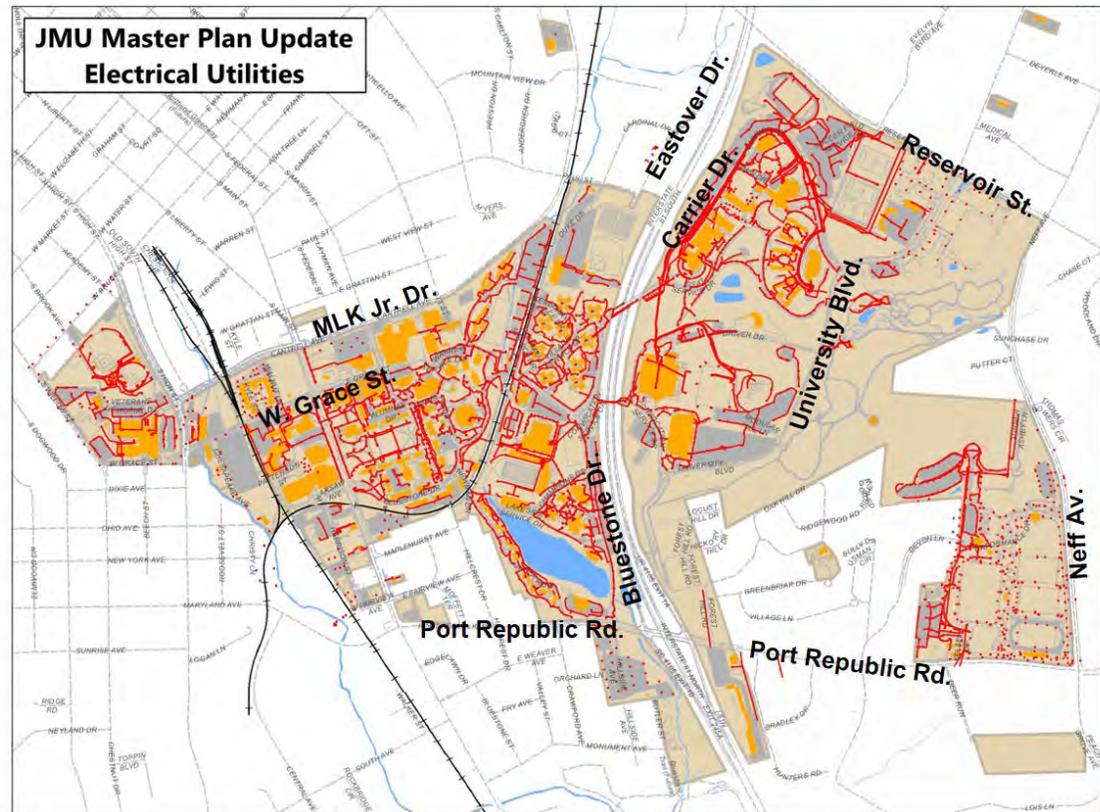


Figure 36 : Existing Campus Electrical Utilities

The University maintains an extensive information and telecommunications network to support the daily operations of the campus. Continual planning and upgrades are developed to support the University's needs in concert with evolving technologies within the industry. In general, a campus-wide ductbank system to support a fiber distribution network is utilized.

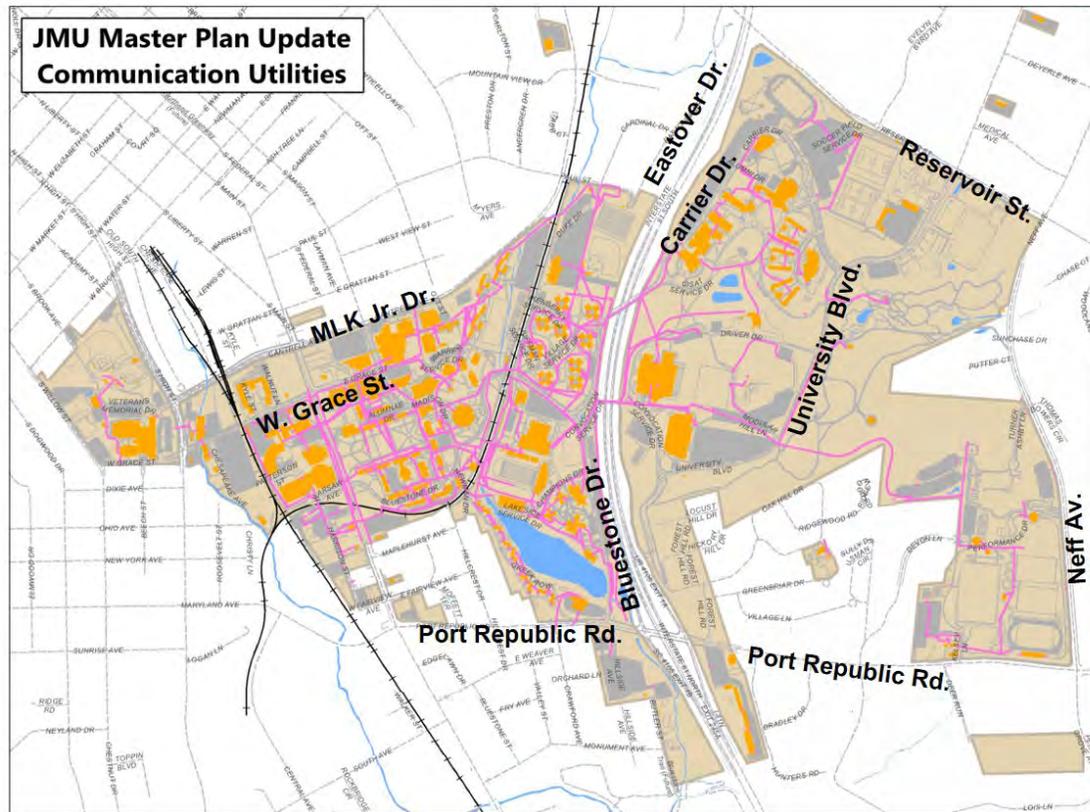


Figure 37 : Existing Campus Communication Utilities

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CAMPUS MASTER PLAN UPDATE 2017

VI DEFINING CHARACTERISTICS

The following are the characteristics that define the type of institution that James Madison University strives to become during the planning years 2014-2020. (Source: <http://www.jmu.edu/jmuplans/corequalities/index.shtml>)

Academic Quality: Outstanding Programs

- The University will foster student success by providing a holistic learning environment focused on furthering intellectual development as well as education in areas such as teamwork, leadership, collaboration, interpersonal skills, entrepreneurship, ethics, citizenship, sustainability and service.
- The University will provide high-impact learning experiences such as undergraduate research, service learning, internships and study abroad programs in a climate that fosters intellectual engagement in and outside the classroom.
- The University will recruit and retain high-quality faculty and staff through providing competitive salaries, other compensation and opportunities for professional development.
- The University will be a national leader in the assessment of learning.
- The University will develop programs that are responsive to the needs of the Commonwealth, nation, and the world.
- The University will develop and offer international curricula, associations and experiences that enhance the global competencies of the student. GOAL: Develop and implement plans for expanding opportunities for studying abroad, international internships, international service learning programs, international student recruitment, international programming on campus, and the infusion of international components into the curriculum.
- The University will continue to be a selective institution in our admission practices and admit students who will enable the University to realize its mission. GOAL: Establish admissions criteria for all students that will result in selection processes that identify students who will benefit from the University and in turn, advance its mission. Establish a process to assess societal needs; recommend and implement new and innovative programs.
- The University will focus on student learning and development through collaboration across all divisions. GOAL: Enhance students' learning and development through attention to the University's curriculum, its classroom environments, its policies and procedures, faculty-sponsored activities outside of the classroom and other out-of-class activities.



Academic Quality: Teaching, Scholarship and Research Excellence

- The University will make teaching excellence and academic rigor top priorities and will provide adequate and sustained support to ensure appropriate student-faculty ratios and continuing professional development.
- The University will provide appropriate levels of sustainable support, oversight and accountability for students, faculty and staff engaged in research and scholarship.
- The University's mission, vision and values will be reflected in faculty and staff evaluation and curriculum development.

Access, Inclusion of Diversity

- The University will determine the composition of the student body that is both appropriate and adaptable to the changing needs of the University and the Commonwealth.
- The University will expand access, building new bridges to cross existing socioeconomic, geographic, learning and/or physical barriers to participation in academic pursuits and campus activities.
- The University will show evidence of a continuously improving environment that is welcoming and inclusive; such that events, messages, symbols, and services express mutual respect.
- The University will continue personal and professional development related to enhancing understanding of diversity while leveraging increased diversity through university/community partnerships.
- The University will increase merit and need-based scholarship offerings.
- The University will infuse a value and culture of diversity into the primary teaching, research and service approaches of academic units.



A Culture of Philanthropy

- Through all its constituencies, the University will foster the understanding that everyone has a meaningful role in the advancement of the University.
- The University will develop and communicate ambitious and inspiring giving opportunities.

Engagement

- The University will develop new programs for students to foster the learning of engagement, its concepts, value and practices.
- The University will foster connections that engage constituents to be part of a global network aimed at achieving mutually beneficial outcomes.
- The University will expand its service provided to the local community, region, and beyond.
- The University will foster an environment of collaboration across colleges, schools, and departments.

Faculty and Staff Success

- The University will identify and implement a comprehensive approach to work-life balance.
- The University will support the creation and review of multiple clear and open avenues for faculty and staff to progress in their careers.
- The University will increase resources to support mentorship, coaching and professional development for faculty and staff.
- The University will provide employees with resources, opportunities and co-worker interactions necessary for meaningful workplace involvement.



Fiscal and Facility Resources

- The University will be a safe, attractive and friendly place to learn and work.
- The University will incorporate best practices - state-of-the-art classroom spaces, sustainability, effective use of technology, accessibility, ect. - in the renovation and construction of facilities.
- The University will implement revenue-generating strategies and operational flexibilities to achieve the University's missions and goals.
- The University will regularly evaluate the effectiveness of existing programs and the potential of new proposed programs and initiatives in making decisions regarding the allocation of resources.
- The University will leverage current and emerging technologies in support of collaboration with the community, state, region, and the world to deliver quality learning opportunities.
- The University will utilize technology innovatively to provide information, student services, and programs.

Innovation

- The University's academic policies will reflect the University's mission, vision and values.
- The University will foster a climate and culture that values creativity and innovative approaches and solutions in all departments and divisions.
- The University will identify innovative ideas and resource those that are considered most effective at helping the University achieve our mission or vision.



VI DEFINING CHARACTERISTICS

National Prominence

- The University will attract and retain top faculty, staff and students from across the Commonwealth, nation, and the world.
- The University will be recognized nationally for excellence in programs and services.
- The University's strong national reputation will provide a wide range of career opportunities for our graduates.
- The University will build a national profile by creating programs that reflect the legacy of James Madison the man.

Recreation and Athletics

- The University will provide a wide range of fitness and recreation opportunities targeted to the needs of the University community.
- Student-athletes, teams and coaches will compete annually for NCAA post-season appearances and earn conference, state and national recognition for excellence in both academics and athletics.
- The University will value student-athletes by supporting their academic success.

Student Life and Success

- The University will ensure that student life and success functions bridge and balance curricular and co-curricular efforts, extending academic and experiential learning with application and reflection.
- The University will provide high quality, research-based, nationally recognized student support programs and services.
- The University will provide high quality advising, services and programs that directly support students' career and professional development goals and desired outcomes following graduation.





Paulien & Associates, Inc. was contracted in 2016 to conduct a Space Needs Analysis and Utilization Study, as well as to assist in the development of Space Reallocation Scenarios, in support of the campus-wide master planning effort. The full report findings and descriptions can be found in the appendix of this document.

Paulien & Associates was provided with facilities, enrollment, course, and staffing data from Fall 2015. The facilities data included room identification, square footage, room use, and departmental information on a room-by-room basis. Enrollment data consisted of Fall 2015 student headcounts for on-campus students. The course data contained course numbers and descriptions, enrollment, start and stop times, and meeting locations. The staffing data contained headcounts and full-time equivalent (FTE) by major employee category on a departmental basis. The data provided a snapshot of the activities for the Fall 2015 semester, which is used for the master planning base year. The current student enrollment is 20,211 student headcount; a maximum projected growth of 23,471 student headcount, an increase of 16%, by year 2027. The analysis uses the assumption that the faculty-to-staff ratios will remain the same. The number of faculty and staff were projected based on a method commonly used in space planning: faculty were projected at the same rate as that of students, and staff were projected at one-half that rate.

Student Enrollment Summary - Campuswide	Fall 2015	Target Year	Increase (Decrease)	% Change
Total Student Headcount (On-Campus)				
Student Headcount	20,211	23,471	3,260	16%

Table 51.1: Campus Enrollment Projection

Credit Hour Production • College / Unit	Fall 2015	Target Year	Increase (Decrease)	% Change
College of Arts & Letters	80,183	84,756	4,573	6%
College of Business	47,780	63,825	16,045	34%
College of Education	11,855	12,686	831	7%
College of Health & Behavioral Studies	49,754	60,093	10,339	21%
College of Integrated Science & Engineering	18,808	24,115	5,307	28%
College of Science & Mathematics	48,940	61,987	13,047	27%
College of Visual & Performing Arts	22,548	25,156	2,608	12%
University Studies	1,796	2,487	619	34%

Table 51.2: Credit Hour Production

GOALS & OBJECTIVES

- Reflect a true picture of existing physical assets
- Portray optimum space needs by functional area at target enrollment
- Analyze the difference between the above from a quantitative perspective
- Begin to strategize the physical response to the planning objectives as suggested by the space needs outcomes

PLANNING ASSUMPTIONS

- Facilities inventory includes all ASF on campus belonging to JMU except residential housing
- Existing and projected student enrollment provided by JMU
 - By major, including undeclared
 - Differentiated between undergraduate and graduate students
- Faculty projections provided by JMU as head count by academic discipline
- Quantitative rather than Qualitative
 - Analysis focuses on amount of space rather than aesthetics of space
- Analysis considers future space use
 - Space reallocations and designs currently in progress (e.g. Showker Hall)
 - Construction underway such as the new Gibbons Dining Hall
- Analysis excludes facilities proposed for future demolition from the facilities inventory at target enrollment

SPACE NEEDS PROCESS

- Collection Of Data
 - Fall 2015 Facilities Inventory
 - Fall 2015 Course Data
 - Fall 2015 Staffing File
 - Fall 2015 Enrollments
- Work Sessions with JMU
 - Discussed programs and instructional methodologies
 - Validated data elements
- Classroom and Teaching Laboratory Utilization
- College/Unit Space Needs Analysis by Space Category

DEFINITIONS

ASF: Assignable Square Feet

- Usable space assigned to a program
- Measured from inside wall to inside wall
- Excludes public restrooms, elevator areas, stairwells, egress corridors, main circulation paths, mechanical/electrical/plumbing spaces, and structural areas

GSF: Gross Square Feet

- All space within a building's footprint
- Space Categories
- Defined according to Space Use Code designation and departmental/unit assignment
- Defined per NCES Postsecondary Education Facilities Inventory and Classification Manual

SPACE USE CODES

- Defined per NCES Postsecondary Education Facilities Inventory and Classification Manual

AN INTRODUCTION TO SCHEV

The State Council of Higher Education for Virginia (SCHEV) is the Commonwealth’s coordinating body for higher education. SCHEV was established by the Governor and General Assembly in 1956. Then as now, their mission, which is outlined in the Code of Virginia, is “to promote the development of an educationally and economically sound, vigorous, progressive, and coordinated system of higher education” in Virginia.

To fulfill their mission, SCHEV makes higher education public policy recommendations to the Governor and General Assembly in such areas as capital and operating budget planning, enrollment projections, institutional technology needs, and student financial aid. SCHEV administers a variety of educational programs that benefit students, faculty, parents, and taxpayers. SCHEV serves as a catalyst to promote greater access, quality, affordability, and accountability throughout the system. SCHEV also helps policymakers, college administrators, and other concerned leaders work cooperatively and constructively to advance educational excellence.

GUIDELINE ASSUMPTIONS AND APPLICATIONS

As part of the scope of this analysis, Paulien & Associates reviewed these guidelines as compared to space standards established in previous work of the consultants for similar institutions. Where SCHEV guidelines or recommendations were determined inappropriate or silent, the consultant used a modified application of the SCHEV guideline or employed a different guideline method. The different methods include benchmarking, review of design and/or program plans completed for prior projects, and empirical data to project space needs.

The goal in applying these guidelines was to provide the University with adequate space to conduct its current and future activities. The sections in the following pages specify which guideline was applied to each space category and provide an explanation of the guideline application and where pertinent a comparison to the SCHEV guideline. In order to apply the various guidelines and conduct the space needs analysis, several assumptions were made. Assumptions applied to specific space categories are listed in the full report available in (Appendix : Report 04).

GUIDELINE OVERVIEW

CLASSROOM AND CLASSROOM SERVICE

- The average of 18 ASF per student station is appropriate given the overall mix of classroom sizes.

TEACHING LABORATORIES & LABORATORY SERVICE

- The consultants employed a space per student station guideline based on approximately 50 different subject areas. Traditionally, the guideline systems that use this type of approach express the space guideline as a range often including service space. Based on the consultant’s experience, both at the master plan level and at a program plan level, guidelines were selected for the disciplines shown in the table below.

Discipline	Guideline Used
Art	80 ASF/Station
Biological Sciences	65 ASF/Station
Chemistry	75 ASF/Station
Computer & Information Science	60 ASF/Station
Computer-Based Learning	40 ASF/Station
Dance	150 ASF/Station
Education	40 ASF/Station
Foreign Language	40 ASF/Station
Geography	60 ASF/Station
Mathematics	30 ASF/Station
Physical Sciences	75 ASF/Station
Physics	75 ASF/Station
Theatre	80 ASF/Station

Table 53.1: SCHEV Assignable Square Feet By Discipline

VI GUIDELINE APPLICATIONS

OFFICE SPACE (ACADEMIC AND ADMINISTRATIVE)

- The guideline application for office space needs is based upon major categories of staff types, and the additional application of space amounts for office service and conference space needs. James Madison University provided staffing information with individual job title, EEO code, department, full-time equivalent, and full-time or part-time status. The consultant then organized each into major categories as shown in the following Office Guidelines table.

OPEN LABORATORIES

- The consultants believe that a reasonable open laboratory guideline for the University is six (6) ASF per student FTE at the target enrollment.

Office Guidelines

Discipline	Office ASF
President	300
Vice President	200
Dean	200
Associate Vice President	160
Associate Dean	160
Executive/Administrative	150
Director	150
Associate Director	140
Faculty	140
Faculty (Part-time)	70
Professional Staff	120
Manager/Supervisor	110
Clerical & Secretarial	105
Student Workstation	35
PE/Athletic Staff (office space in guideline)	0
Library Personnel (office space included within Library guideline)	0
Service & Maintenance (no office required)	0

Table 54.1: SCHEV Assignable Square Feet By Staff Type

RESEARCH LABORATORIES

- The consultants calculated the need for research space for James Madison University as an ASF per annual research expenditure that was within the spirit of the SCHEV guideline.

LIBRARY

- Most of the guideline systems for library space use one set of factors for collections, another for reader stations, and a third for service space. SCHEV does not have a set of guidelines for library space. Guidelines for library space were used that are mindful of those published by the Association of College and Research Libraries (ACRL), which the consultant has applied at similar institutions. The guideline includes office space for library personnel in the service space factor, as is the study service space. Open stack study space is a portion of the total reader stations/study space generation.

OTHER ACADEMIC DEPARTMENT SPACE

- The space classified as Other Academic Department Space includes all other space assigned to a department that has not been included in the other classifications of classrooms, teaching laboratories, open laboratories, research, or office. These areas often consist of a variety of spaces including: study rooms, vending areas, meeting rooms, locker rooms, media production, clinic spaces, demonstration rooms, animal quarters, greenhouses, learning center space, lounges, and central computer rooms. Due to the diversity of these spaces and the different ways various campuses might classify these spaces, they are not specifically addressed by recognized guideline systems. SCHEV addresses these space types, but only if the space is classified as E&G space.
- Other academic space at the University was five (5) ASF per student FTE during Fall 2016. The consultants believe this generates an appropriate allocation of this space category.

OTHER ADMINISTRATIVE DEPARTMENT SPACE

- As with Other Academic Department Space, Other Administrative Department Space consists of the same types of spaces, except they are allocated to administrative units. These spaces include non-office related work and processing rooms, telecommunications/ phone rooms, lounge areas, and general meeting rooms. No guideline exists to deal in a generalized way with such a diverse set of space needs. The consultant has found other administrative department space to be a range unique to an institution's type and mission.
- Other administrative space at the University averaged just under eight (8) ASF per student FTE. The consultant applied a guideline of 5.5 ASF per student FTE.

ASSEMBLY & EXHIBIT SPACE

- The consultant applied a guideline in accordance with the parameters of an institution such as James Madison University. This guideline has a core allowance of 22,450 ASF for institutions with a minimum of 5,000 Student FTE and an active fine arts program. It then allows for an additional six (6) ASF per Student FTE over the 5,000 FTE minimum. This guideline also adds 5,000 ASF for institutions with an active music program.

PHYSICAL PLANT

- While the SCHEV guidelines recommend not more than seven (7) ASF per student FTE for physical plant, the consultant believes that this application would be too limiting at James Madison University, given the variety and quantity of space types to be supported. The master plan level space guideline has, in the last several decades, been at a percentage ranging from 6 to 8 percent (6-8%) of all square footage on campus, minus existing physical plant and residence life space. The consultant used five (5) percent at James Madison University to reflect the current application of physical plant guidelines, which at the target enrollment level equals nine (9) ASF per student FTE.

STUDENT HEALTH CARE FACILITIES

- The guideline applied at James Madison University is 0.3 ASF per student headcount.

PHYSICAL EDUCATION & STUDENT RECREATION SPACE

- The consultants used the guideline developed by Bareither & Schillinger in their book *University Space Planning* to generate physical education and recreation space. Application of the guideline includes 12.1 ASF for each undergraduate student, 25% of the graduate students, and 15% of non-student staff.

ATHLETIC SPACE

- Due to the varied space requirements of indoor athletics program space, there is no one guideline that addresses this space category as athletic space needs are usually based on the number and competitive level of the intercollegiate athletic activities.

STUDENT CENTER SPACE

- Widely used guideline systems recommend nine (9) or ten (10) ASF per student for generating student center space. These guidelines provide space for the various functions, and the space use code designations that are typically found in a comprehensive student center.

VI SPACE NEEDS ANALYSIS KEY FINDINGS

CLASSROOM UTILIZATION

There are 210 classrooms at James Madison University. Between 9:00 AM and 4:00 PM, 85% or more of the classrooms are in use. During the late afternoon and early evening hours (5:00 PM to 7:00 PM), classroom use drops to approximately 64% of spaces used. Only 33% of classrooms are in use at 8:00 PM, and 5% at 9:00 PM.

The 210 classrooms on the James Madison University campus averaged 32 weekly room hours of use at 75% student station occupancy. The 210 classrooms are located within 24 different buildings. 77% of the total classrooms are located within 11 campus buildings. The largest percentages of classrooms are within Miller Hall (10% of the total classrooms), Zane Showker Hall (9% of the total classrooms), Memorial Hall (9% of the total classrooms), and Health and Behavioral Studies and Harrison Hall (8.6% of the total classrooms).

Campus wide, classrooms with capacities of 100 to 250 student seats showed the highest weekly room hours. Classrooms of 101 – 150 seats used an average of 38 weekly room hours, and classrooms of 151 – 250 seats used an average of 44 weekly room hours. The majority (41%) of classrooms have a room capacity of less than 31 student seats; 25% of classrooms have a room capacity of 31-40 seats, and 25% have a room capacity of 41-99 seats.

TEACHING LABORATORY UTILIZATION

Campus wide, James Madison University class laboratories averaged 27 weekly room hours at 84% student station occupancy. The Biology Department had the highest quantity of teaching laboratories at 12 (20% of the total teaching laboratories) followed by the School of Art, Design, and Art History with 9. The average utilization for the disciplines of Geology, Communication Studies, Physics and Psychology exceeded 90%.

This high utilization of teaching laboratories emphasizes a trend at James Madison University, which is the transfer of academic instruction from the classroom into a paradigm embracing a more hands-on approach, with instruction occurring more often in teaching laboratories.

SPACE NEEDS ANALYSIS

With guidance from James Madison University and using the State Council of Higher Education for Virginia (SCHEV) July 2001 space guidelines, an analysis was developed to determine current and projected space needs. This analysis was used to determine the magnitude of need, and is not a substitute for detailed programming as implementation of facilities' priorities occurs. The consultant diverged where appropriate from the SCHEV guidelines. Most notably, the SCHEV guidelines only address Educational and General Space (E&G) space, while this analysis covers all space – E&G and auxiliary. While SCHEV's guideline for Instructional and Academic Support Space, which includes facilities used for academic instruction, administration, personnel development, etc., is assigned a guideline of 42.5 ASF plus up to an additional 7.5 ASF per FTE, the consultant has broken out the analysis more deliberately by space category, and applied appropriate guidelines as such. SCHEV's research guidelines allocate 400 to 800 ASF per \$100,000 of annual research expenditures, based on discipline. The consultant determined research space at James Madison University with respect to the SCHEV guideline, but allocated space towards serving the academic mission of undergraduate (capstone) research as well.

Classroom Utilization Summary

	Campus Average	SCHEV Guideline
Weekly Room Hours	35	40
Weekly Station Hours	23.8	N/A
Student Station Occupancy	69%	60%
ASF per Student Station	18	17
Number of Rooms	190	N/A

Table 56.1: Classroom Utilization Summary

Class Laboratory Utilization Summary

	Campus Average	SCHEV Guideline
Weekly Room Hours	23	40
Weekly Station Hours	18.5	N/A
Student Station Occupancy	79%	75%
ASF per Student Station	20	varies
Number of Rooms	84	N/A

Table 56.2: Class Laboratory Utilization Summary

ACADEMIC SPACE NEEDS – TARGET YEAR

Overall, James Madison University has a deficit in Academic Space. Academic Space includes the space categories of: Classrooms & Service, Teaching Laboratories & Service, Open Laboratories & Service, Research Laboratories & Service, Academic Offices & Service, and Other Academic Department Space.

Significant deficits are evident in the space categories of Teaching Laboratories & Service, Research Laboratories & Service, and Academic Offices & Service. A slight deficit of space in the space category of Classrooms & Service exists at the target enrollment level.

ACADEMIC SUPPORT SPACE

Academic Support Space includes the space categories of: Administrative Offices & Service, Library, Assembly & Exhibit, Physical Plant, and Other Administrative Department Space.

Overall, James Madison University has a deficit in Academic Support Space with almost all categories requiring additional space at the target enrollment level.

Space Category	Fall 2016			Target Enrollment		
	Existing ASF	Guideline ASF	Surplus (Deficit)	Target ASF	Guideline ASF	Surplus (Deficit)
Academic Space						
Classroom & Service	184,637	169,796	14,841	193,485	195,359	(1,847)
Laboratories						
Teaching Laboratories & Service	124,966	159,155	(34,189)	125,588	190,735	(65,147)
Open Laboratories & Service	157,563	169,915	(12,352)	159,031	179,581	(20,550)
Research Laboratories	50,905	92,080	(41,175)	40,469	113,868	(73,399)
Academic Offices & Services	312,350	279,074	33,276	270,965	348,765	(77,800)
Other Academic Department Space	91,447	79,959	11,488	68,846	83,803	(14,957)
Academic Space Total	921,868	949,979	(28,111)	858,384	1,112,111	(253,727)
Academic Support Space						
Administrative Offices & Support						
Library & Collaborative Learning Space	160,165	229,397	(69,232)	173,665	281,777	(108,112)
Athletics						
Assembly & Exhibit	64,393	64,393	0	64,393	64,393	0
Physical Plant						
Other Administrative Department Space						
Academic Support Space Total	224,558	293,790	(69,232)	238,048	346,170	(108,112)
Auxiliary Space						
Physical Education & Recreation						
Student Union						
Student Health Facilities						
Auxiliary Space Total						
CAMPUS-WIDE TOTAL	1,166,426	1,243,769	(97,343)	1,096,432	1,458,281	(361,839)

Areas not included in space inventory for 2017 Campus Master Plan Update

Table 57.1: Space Needs By Category

PARKING SPACE REQUIREMENTS AND PREFERENCES

FUTURE PARKING DEMAND

To assist in development of the Campus Master Plan, a basic parking demand analysis was performed using student growth projections. As noted previously, there is currently a parking space to student ratio of approximately 0.55. This ratio was applied to future student growth projections to estimate future parking demand, assuming the rate of demand is constant. The projected new demand in the Master Plan period is approximately 1,200 spaces. The analysis is summarized in Table 58.1.

Existing Conditions	
Parking Spaces	12,191
Students	20,211
Ratio (spaces : students)	0.55
Projected Future Conditions	
Students	23,471
Ratio (spaces : students)	0.55
New Demand (spaces)	1,162
Total Spaces Needed	13,353

Table 58.1: Projected Parking Demand

Future Parking Supply

Like many universities, JMU has limited options within its campus boundary for accommodating new buildings and development. As the campus continues to develop, existing surface parking lots will be lost to new buildings. Some surface lots may also be converted to open space or other uses to enhance the environment and add to the aesthetic appeal of the campus. Table 58.2 shows that approximately 2,100 current parking spaces may be lost as the Master Plan builds out.

The majority of new parking added to the campus will be provided by building new parking decks. These decks allow the campus to maximize the use of space surrounding campus buildings as well as adding a large amount of parking in one location. The majority of the campus's future growth will be centered within the East Campus. As a result, many of the new parking decks scheduled to be built will be located within the East Campus. Traffic Impact Analysis (TIA) Studies and recommendations based on the result of the studies will need to be generated for each of the proposed development projects. VHB is currently completing a TIA study for the proposed Chesapeake Parking Deck to be located on Chesapeake Avenue within West Campus. Overall the parking data projects a deficit of approximately 180 spaces.

Current Parking Spaces	12,191
New Demand (Spaces)	1,162
Total Spaces Needed	13,353
Total Spaces Lost (Master Plan Buildout)	2,098
Net (Current - Lost) Spaces	10,093
Gains (Convocation Deck, Chesapeake Ave, East Campus)	3,081
Total Projected Spaces	13,174
Surplus/(Deficit)	(179)

Table 58.2: Parking Reconciliation

TRAFFIC ANALYSIS

Trip Generation

One of the most significant impacts that the growth of the JMU campus will have is the associated growth in traffic on the streets and roadways providing access to the campus. While it is not the objective of this analysis to prepare a detailed traffic impact of the growth at JMU, it is possible to estimate the relative growth in traffic over the 10-year planning period on the streets serving the campus. To determine the impact of this future development, parking was determined to be the best indicator of additional trips for the study area network. For this analysis, parking demand is a function of the growth in the campus activities and is a surrogate for trip generation. By 2027, the overall additional parking on JMU's campus is expected to increase by 3,081 spaces to a total of 13,174 in comparison to the existing 12,191 spaces. The objective of the future analysis is to determine the impact these changes will have on campus sub areas and on the campus transportation network. To accomplish this, parking was converted into average daily vehicle trips and then distributed to the study area network, as described below.

Impacts of Traffic Growth

The following is a brief discussion of the general impacts of the traffic growth for the campus and in particular on the streets serving each of the five campus subareas used in this analysis.

Bluestone Campus

As a percentage, the growth in traffic for the Bluestone sub-area is lower than both the West and East campuses.

Mid Campus

With little projected growth along this portion of the JMU Campus, traffic impacts are minimal. A small amount of parking is being removed due to the Grace Street Extension Project, but the -1% change in trip generation is not enough to cause major traffic impacts elsewhere in the Campus.

East Campus

This portion of Campus is projected to see a 28% change in traffic growth over the next 10 years. The majority of the proposed locations for the larger development projects on the campus are within the East Campus boundaries, including both the Convocation Center Parking Deck and the East Campus Parking Deck which together add a total of 2,300 parking spaces to this section of campus. Traffic Impact Analysis Studies will need to be completed for each of the garages to assess the projected traffic impacts on the surrounding roadways, specifically University Boulevard, Carrier Drive, and Reservoir Street.

West Campus

While the traffic growth in the vicinity of the West Campus has the highest percentage of growth of all the subareas, it is also the smallest sub-area in terms of quantity of spaces. The single largest contributor of demand is from the new Chesapeake Parking Deck that will provide 680 new parking spaces. A traffic impact study is currently being conducted that will assess the impact of this additional traffic in the sub-area.

North Campus

The opening of the Mason Street Parking Deck is the largest factor in the 24% percent change for trip generation. Increased vehicular traffic has been seen at the Grace and Mason Street Intersection as well as along MLK Jr. Way. With future building construction, it is anticipated that the Cantrell Avenue Parking Deck will be demolished, leading to a loss of 294 spaces in the sub-area.

VI ATHLETIC & RECREATIONAL SPACE

Increased demand on existing facilities lead to a lack of adequate practice fields, performance fields, arenas, and support facilities when the 2008 Master Plan was issued. That report suggested many improvements to the athletic and recreational facilities. Many of those recommendations have been instituted, and the facilities are vastly improved.

The University currently has a new convocation center under design to address the shortcomings of the aging facility currently used. This will provide a state-of-the-art facility for both men's and women's basketball programs that will help with recruiting efforts on campus. Completion of the new facility is scheduled for November of 2020.



JMU Housing Analysis	
Building	Total Beds
Ashby	64
Converse	108
Gifford	173
Hoffman	156
Logan	97
Spotswood	76
Wampler	153
Wayland	159
Bell	135
Hillside	244
McGraw-Long	203
Chappelear	204
Dingledine	204
Frederikson	182
Garber	204
Hanson	204
Huffman	138
Ikenberry	204
Weaver	204
White	204
Chandler	243
Eagle	434
Shorts	211
Greek Row	460
Chesapeake	423
Potomac	423
Shenandoah	428
Grace Street Apartments	506
New East Campus Housing*	+/- 500
Total Beds	6,944
Loss for Redevelopment	1,991
Subtotal	4,953

* anticipated completion date, July 2019
Table 61.1: On-Campus Housing Bed Counts

As previously stated, housing at JMU is constantly under demand. An analysis of the demand forecast for the University at target date reveals a net deficit of over 3,200 beds. The Facilities Condition Index Report suggests that all 9 of the Village housing buildings are in poor condition, and will need to be demolished.

To accommodate 35% of student enrollment the University will need to replace the Village buildings with new housing units, as well as consider future new housing units on East Campus.

Demand Projection	
Goal at 35% total students	
Projected Enrollment (FTE)	23,471
Total Demand at 35%	8,215
Deficit	3,262

Table 61.2: Future Housing Demand Projection

VI SUSTAINABILITY

A campus administrative office for environmental stewardship, the Office of Environmental Stewardship and Sustainability (OESS), was created in 2008 to coordinate environmental stewardship efforts across campus and advocate for priorities. Over 80 faculty, staff, students, and local government staff representatives serve on environmental stewardship committees that inform and support the OESS. The committees are led by an Executive Council of senior administrators, and the OESS executive director reports to the council. The committees and council are collectively referred to as the Institute for Stewardship of the Natural World.

In 2010, a Climate Action Report was issued with strategies for the University to pursue, in route to becoming an environmentally conscientious campus. Some of the suggestions were increasing the proportion of energy demands that are met by renewable sources, and increasing the proportion of electricity generation provided by emission-free sources of energy.

In 2012, a Climate Action Update stated that emissions were rising at JMU. In response to this, goals were set to reduce emissions on campus. A 10% reduction goal was set for 2041, and a 50% reduction goal was set for 2056, culminating ultimately with a carbon neutral goal set for 2071.



CURRENT PLANNING AND SYSTEM NEEDS - STEAM

The 2017 campus master plan has defined a potential expansion significantly greater than anticipated in the 2006 Campus Wide Steam Survey, as evident in the following summary:

Campus Plan	Basis for For Future Loads	Projected Campus Area	Projected Steam Load
"Campus Wide Steam Survey"	Identified Future buildings	3.9 M GSF	200,000 pph
2017 Campus Master Plan	Land use Program	5.6 M GSF	300,000 pph

The 2017 Campus Master Plan Update is based upon the potential build-out of the existing campus, occurring over multiple phases. The 2006 Campus Wide Steam Survey was designed to support the campus growth from 2.2 million GSF (2006) up to the 3.9 million GSF. As programs are established to increase the campus area beyond 3.9 million GSF, additional planning for steam capacity will be required. Generally, the steam plant has sufficient capacity to support the current construction needs (2017/2018). However, it is nearly at capacity, and future expansion will need to be considered as the campus grows. Wiley and Wilson are conducting an East Campus study for expansion needs at the East Campus Power Plant. Potential concepts to support this additional campus growth are as follows:

- Replace and increase capacity of the boilers at the East Campus Power Plant (ECP)
- Expand existing West Campus Power Plant (WCPP) or construct a new plant

STEAM PLANT OPTIONS

As the steam plant continues to grow and add capacity, consideration should be given to improve the steam plants efficiently. One major change that could be considered is to incorporate a combined heat and power (CHP) system into one or both of the steam plants. This would be a large investment, but can significantly improve the overall plant efficiency and save on electricity costs throughout the Campus. Steam is produced for campus heating and turns a steam turbine which produces electricity for a percentage of the campus usage.

CAMPUS STEAM AND CHILLED WATER INFRASTRUCTURE PLANNING

JMU's first choice for any new building is to utilize steam for the primary heating, and for any new building on the East Campus to utilize both steam and district chilled water. Expanding the steam and chilled water underground piping distribution should be included in the infrastructure planning and budgeting of each new building.

AIR CONDITIONING OPTIONS FOR FUTURE BUILDINGS

The 2017 Campus Master Plan has identified a significant potential growth for the campus. In general, it assumes that the identified future buildings will include air conditioning systems. The following are the estimated system requirements, assuming all new facilities utilized individual building refrigeration systems:

Total Number of Future Buildings:	Approximately 30
Estimated Number of Refrigeration Units:	60 (assuming 2 units per building)
Estimated Conditioned Area:	3.3 Million gsf
Total Building Cooling Loads:	10,000 tons
Estimated Annual Electric Use:	15 million kwh per year
Approximate Annual Electric Cost:	\$1.2 million per year

The challenges associated with the individual building cooling systems for the future facilities are as follows:

- Maintaining an additional 60 refrigeration units on campus
- Average capital renewal of 2 to 3 units per year
- Significant increase in electric use and cost

As the campus grows, alternative approaches to individual buildings systems should be evaluated for specific regions of the campus. The development of potential chilled water districts to reduce maintenance, lower annual operating costs, and improve the sustainability of the system, should be evaluated. The specific areas which may provide the best economics for a district cooling system are noted in the utility report referenced in the appendix of this document. For JMU, having district chilled water on the West Campus would be very difficult due to site and building density challenges. However, the East Campus should be considered for expansion with growth, and should be the first choice for cooling of new buildings. For the Mid Campus, for new large grouped buildings such as the Village Housing, a central chilled water plant should be considered to reduce outdoor equipment, and improve efficiencies for this large cooling load (910K GSF).

STORMWATER

Current Planning And System Needs

Proposed projects will be required to mitigate the stormwater quality and quantity effects caused by new development. The Virginia Stormwater Management Handbook describes the regulatory requirements for meeting both quality and quantity site requirements based on disturbed acreage, soil conditions, amount of impervious area, and various other site conditions. Storm sewer piping will be extended and installed, as needed, for each project site. Capacity of the existing pipe network shall be evaluated with each proposed development. RCP Class III pipe with wrapped joints is recommended for future development because JMU tends to have karst soil conditions.

SANITARY SEWER

Current Planning And System Needs

New development projects continue to require extension and upgrades to the existing sanitary sewer system. Capacity of the sanitary sewer line will be analyzed with the design of each project, to ensure the existing system will have enough capacity for the proposed demands. Future development within the Village Area may cause sanitary capacity issues with the City's 24" sewer main, which will most likely be utilized. The City of Harrisonburg may require survey data on the interceptor, downstream of the site to Bridgeforth Stadium, to evaluate the full effect of the development on the existing system. Ductile Iron piping is recommended for future development due to the rocky subgrade.

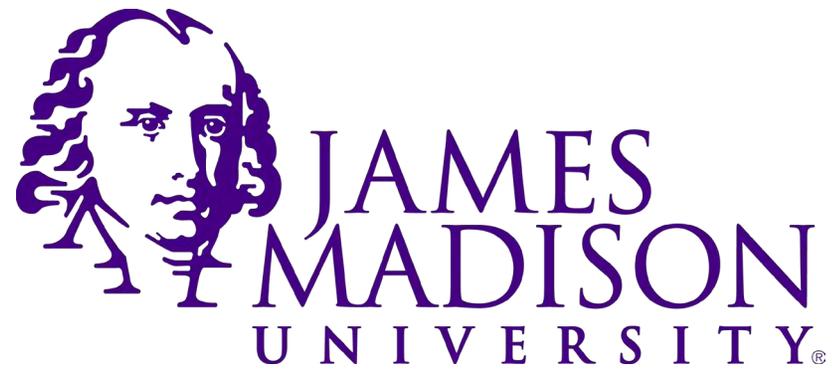
POTABLE WATER

Current Planning And System Needs

Upgrades and extensions to the water system throughout campus are completed as needed for new development projects. Capacity and sizing of the water lines will continue to be evaluated with each proposed construction project. Water lines will be required to be sized for fire and potable water demand. Consideration to connect future development projects to the master meters will decrease the amount of water meters that have to be installed, maintained, and checked throughout Campus. Ductile Iron piping is recommended for future development due to the rocky subgrade.

PRELIMINARY MASTER PLANNING

VII



CAMPUS MASTER PLAN UPDATE 2017

VII AREAS OF OPPORTUNITY

Initial areas of opportunity were identified through several avenues. The reports, analyses, meetings, and University preferences identified numerous creative approaches for consideration within the following focus areas:

Improved Site, Building Use, or Reallocation areas were evaluated as to whether they meet their best use, with particular regard to adjacency and function.

Improved Entrances and Gateway areas were proposed to help establish and improve image, function, and overall aesthetics of the campus.



Figure 38: Areas of Opportunity

In an effort to best describe, analyze, and react to the expansive campus, the recommendation was to categorize the campus into five distinct areas for ongoing purposes to best describe, analyze, and report outcomes of its planning process.

For these purposes the campus is divided geographically into:

- The Bluestone Campus
- The Mid Campus
- The East Campus
- The West Campus
- The North Campus

These areas are illustrated in Figure 39, and are referred as such throughout the remainder of this document.

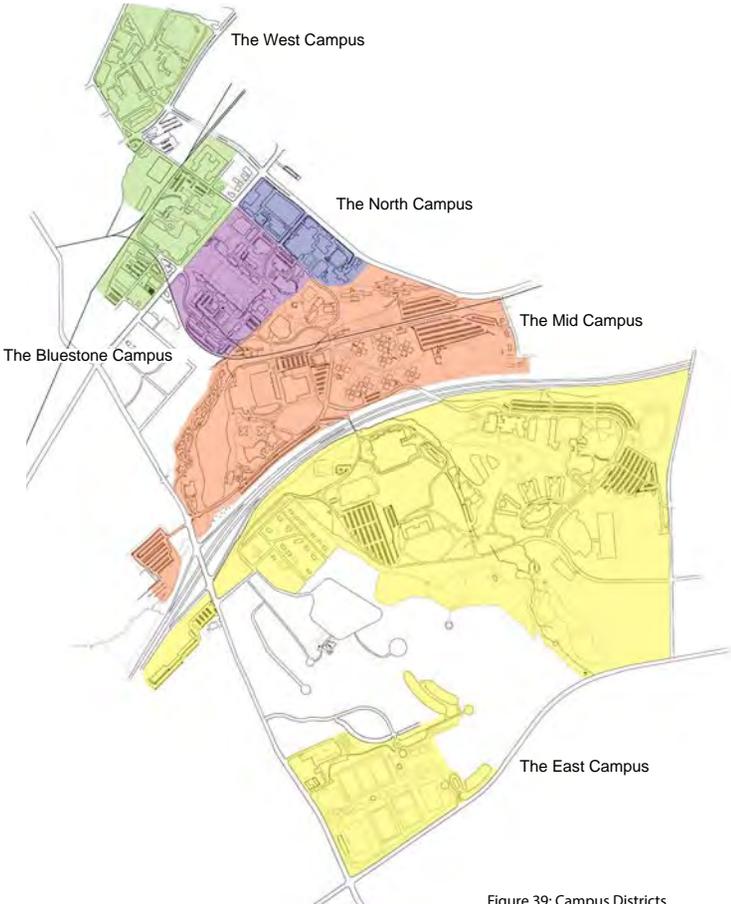


Figure 39: Campus Districts



VII LANDSCAPING, ENTRANCES, GATEWAYS & BOUNDARIES

LANDSCAPING

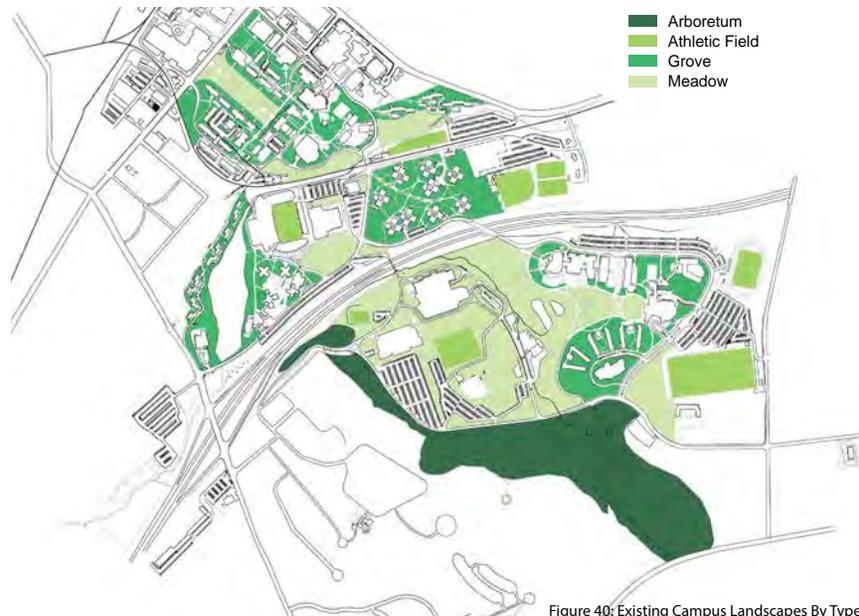
Preliminary efforts for the landscaping portion of this master plan began with a thorough investigation of previous efforts to establish landscaping themes.

Four campus landscape theme areas were designated in the concept plan for the College of Integrated Science and Technology in the 1993 Plan. The areas represented landscape types found either as they occur in nature, or as they are traditionally cultivated in Virginia's Shenandoah Valley.

The Meadow landscape is an open space with native grasses and wild flowers. Grove landscapes are associated with campus buildings and drives, characterized by high canopies of hardwood trees and open spaces. The Arboretum is characterized simply as wooded. Planting materials most closely reflect the natural selection of the Shenandoah Valley woodlands.

The Glade was also described in the 1993 plan as an area of fine-grained open or landscaped space near buildings, including paved areas and terraces. For the purposes of this exercise, glades were not delineated, as nearly all buildings require some type of landscaping treatment.

Athletic fields are noted for adjacency and quantity considerations.

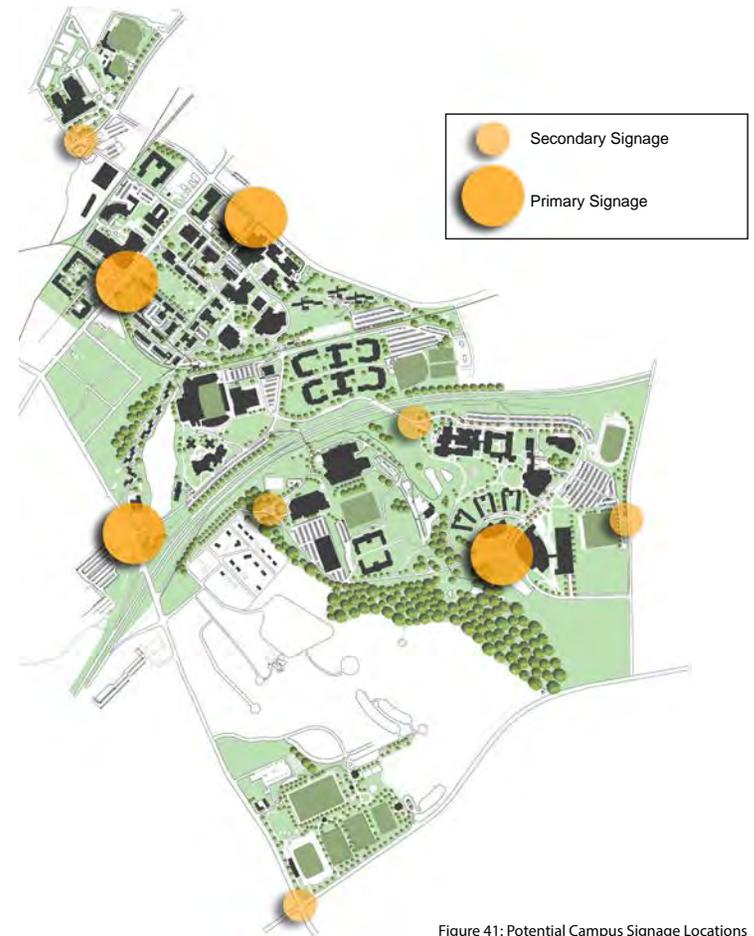


ENTRANCES & GATEWAYS

Locating the primary and secondary entrances to campus was explored using vehicular and pedestrian traffic patterns. The concept illustrated below shows potential signage locations.

BOUNDARIES

The campus is pursuing new facility efforts, and the master plan recommends a thorough site analysis and investigation for all new campus projects.



This area of campus has long served as the historical backbone of the University. Given the limitations of buildable area in this district, creating and reorganizing outdoor and greening opportunities seems to be a natural evolution.

Any alterations to this part of campus should focus on preserving existing buildings, with future growth being located on the periphery of the precinct.



VII MID CAMPUS LAND & BUILDING USES

Mid Campus is comprised of several housing projects (including the Village, which displayed a large housing deficit), Madison Union, and is considered the dining “hub” of campus, with buildings such as Gibbons Hall, D-Hub, and a future Phillips Hall replacement currently in development.

Mid Campus is also the location of the recently expanded Bridgeforth Football Stadium, as well as Showker Hall, home to the College of Business. With the recent demand and growth of the College of Business, Showker Hall is slated for an addition and renovation totaling 211,164 SF, of which 114,757 SF will comprise the new addition. The project is scheduled to open in the spring of 2020.



East Campus has seen much development since the 2008 Campus Master Plan. East Campus Dining Hall, Bioscience, Shenandoah Residence Hall, and the UREC Expansion and Renovation have come on-line. A new Convocation Center and Parking deck, as well as a 500-bed residence hall, are currently in development.



VII WEST CAMPUS LAND & BUILDING USES

PRELIMINARY MASTER PLANNING

Many recommendations from the 2008 Campus Master Plan have been incorporated. Since that plan, Veterans Memorial Park has opened for both the baseball and softball programs. Memorial Hall, formerly Harrisonburg High, is now home to the College of Education.

Though not originally part of the 2008 Campus Master Plan, The Apartments on Grace opened in August 2015 to house over 500 upperclassmen at JMU. A 685-vehicle parking deck is currently under construction.

The USB Annex was opened in the Summer of 2017, and will begin the phasing of the physical plant out of the University Services Building. This precinct of campus will continue to grow into a larger arts district, and eventually house a design museum.



The North Campus has experienced vast change since the 2008 Master Plan, led by the acquisition of the old Rockingham Memorial Hospital, and its conversion to the new Student Success Center. This precinct has very recently provided spaces for many of the University's needs, including student services and admissions.

It is also home to the College of Health and Behavioral Studies, as well as a new parking deck and a hotel and conference center now under construction.



VII VEHICULAR CIRCULATION & TRANSIT

VEHICULAR CIRCULATION CONCEPTS

A variety of options were analyzed to adjust campus circulation patterns as the campus develops through the Master Plan period. The main goals of these circulation modifications were to improve pedestrian circulation and safety, enhance transit circulation and access, and provide efficient access to potential new parking decks. Opportunities to enhance streetscapes and create gateways and significant campus corridors were also analyzed.

The key is to focus on improvements to the JMU Campus peripheral roads, such as Grace Street, in order to continue to keep the internal campus closed to vehicular traffic during the week, as well as ease congestion on external roads due to the addition of new parking decks and academic buildings.

The main components of this plan are:

- Extend Grace Street – consists of a new two-lane road to connect East Grace Street with Bluestone Drive and Duke Drive. The Grace Street extension also creates an opportunity to make Grace Street a significant campus corridor through new development and streetscape enhancements.
- Addition of a gate east of the Grace Street Parking Deck – Gate to be located at the intersection where Grace Street currently terminates with Bluestone Drive, and is to be completed with the Grace Street Extension Project. The gate will allow vehicles to exit the Grace Street Parking Deck throughout the week, but continue to keep the vehicular traffic away from the internal campus roads.
- Grace Street and Mason Street Intersection Improvements – The opening of the Mason Street Parking Deck increased congestion, both vehicular and pedestrian, along Mason Street, Grace Street, and MLK Jr. Way. The improvements consist of widening Grace Street to allow the addition of turn lanes, adding a pedestrian sidewalk with crossings at the East Grace Street and Mason Street intersection, and the installation of a median and fence along Mason Street to prevent left turns out of the parking deck onto Mason Street. A traffic signal will also be added at the intersection of Grace and Mason Street, directing traffic flow and pedestrian crossings.

TRANSIT CONCEPTS

Improving transit access and making transit a viable mode choice for JMU students, faculty, and staff is a key objective of future transportation improvements. The campus is currently served by two Inner Campus Shuttles and various city routes, all operated by the Harrisonburg Department of Public Transportation (HDPT). The main challenge those routes face is the lack of alternative routes through campus, and sharing interior campus roads with vehicles, pedestrians, and bicyclists.

Transit access to campus will continue to be a concern as roadway improvements are being designed and constructed. Transit continues to be a major modal connection between the JMU Campus and the City of Harrisonburg. As stated earlier, JMU represents a large portion of the HDPT's ridership base.

Two Campus improvements will directly affect transit travel through campus:

- Bluestone Trail – Construction extends the Bluestone Trail along the northern side of Bluestone Drive, between Carrier Drive and Sonner Hall. The bus lane in front of Chandler Hall is being restriped and reduced in width for construction of angled parking, and a median between Bluestone where the trail will pass through.
- Removal of the Bus Stop at the Student Success Center along Mason Street – Buses, starting in Spring of 2017, will alternatively utilize the Miller Hall lot as a bus stop, and will leave the lot heading north on Mason Street from Madison Drive.

As the Grace Street extension opens and becomes closed to motor vehicle through-traffic, JMU has the opportunity to mitigate the redundancy of many campus transit routes. For instance, on a typical weekday, 12 and 15 different routes utilize the Carrier Drive and Bluestone Drive corridors through the center of campus respectively. As access to certain corridors becomes available, the University should work with the HDTP to efficiently move transit riders through campus, and remove bottlenecks where they currently exist.



In meeting the on-campus student housing requirement (35%) preferred by the University, several areas of campus were studied to add student housing.

Ultimately, because of its prime-central location, the decision was made to address the existing Village Housing site as a new residential precinct with 6 new residence halls, that would total approximately 2,800 beds. The construction of the 6 halls would be phased. Because of the age and overwhelming inadequacy of the existing Village units, it made both economic and functional sense to rebuild the Village.

To gain an additional 1000 beds needed to meet the 35% student on-campus housing goal, a student housing precinct was selected on East Campus, just south of the University Recreation Center. The 2 resident halls would be constructed in 2 phases. When constructed, the phase 1 residence hall will provide needed swing space for the phased demolition and new construction of the new Village units.

The proposed housing master plan will accommodate growth needs and student preferences for modern day expectations of what housing should provide.

Further explanation of the planned future development of student housing on the JMU campus is discussed on page 99.



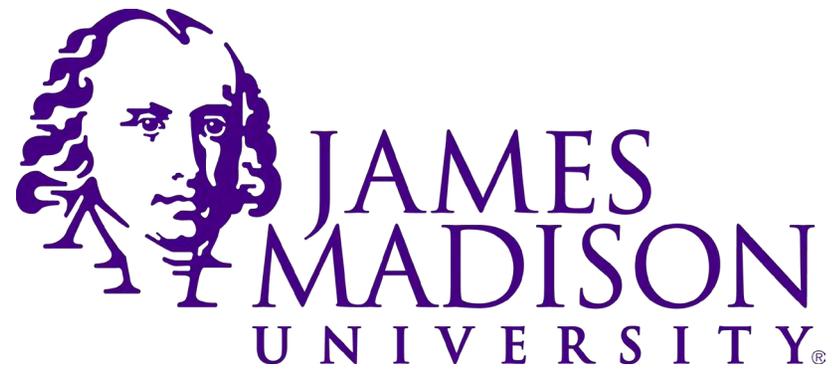
VII ATHLETIC & RECREATIONAL FACILITIES

PRELIMINARY MASTER PLANNING

The University has worked to incorporate many of the recommendations from the 2008 Master Plan. The Bridgeforth Stadium expansion, the University Recreation Center (UREC) expansion and renovation, and the Sentara Park and UREC highlight the commitment made by the University to improve facilities for the students and the student athletes.



THE FINAL PLAN VIII



CAMPUS MASTER PLAN UPDATE 2017

LANDSCAPING

The master plan identifies three distinct landscape types that collectively comprise the campus landscape.

Accent landscape: areas are comprised of display planting beds, gardens, and various specialty, limited extent groundplane planting treatments to sections of the campus. These landscape opportunities typically accent key campus landmarks, such as gateways, and serve as an addition to an existing building or established landscaping theme.

Naturalized landscape: areas are defined by extensive informal, naturalized mass plantings providing a distant and or vast expanse of natural scenic qualities. These areas serve as a backdrop for the more open landscapes of the campus and other, more formally arranged, open space areas.

Major landscape: areas encompass larger portions within campus, and project areas can be considered major capital efforts intended to expand the pedestrian/gathering experience and University interface with both students and the community. These projects are intended to increase the overall quality of programmed campus grounds, and often include accent and naturalized landscape qualities.

ENTRANCES, GATEWAYS, & BOUNDARIES

Campus perimeter boundaries are defined through specific treatments of the campus edges. An established framework of appropriately scaled signage, traffic signaling, crosswalk devises, walks, site furnishings, lighting, and planting can delineate approaches to campus from either the vehicular entrance or pedestrian gateway and improve wayfinding.

Campus boundaries present the public face and image of the University. Identification of an academic institution can be enhanced through proper signage and integrated landscape treatments. Quality and consistency help define and promote a positive campus image. Signage should be well designed and crafted, offering a unique signature, that adds to the character of the University. The Campus Design Guidelines describe attributes and standards for consideration when designing and designating signage and supporting landscaping, found in Section IX of this document.

Recommended locations of Primary and Secondary signage systems are illustrated in Figure 43.



Figure 42: Landscaping by Type

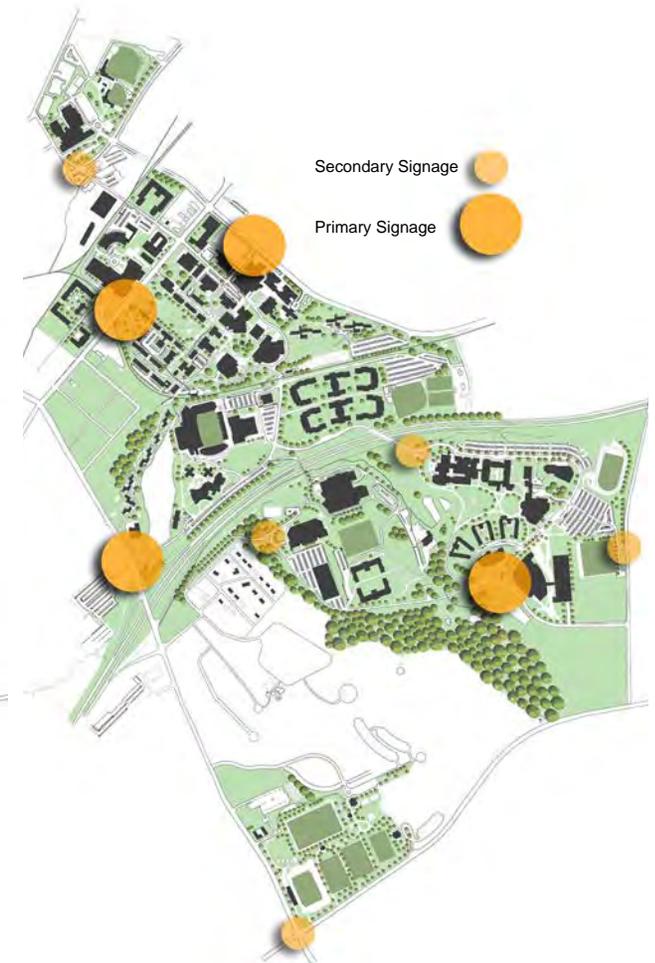


Figure 43: Entrance Signage



Figure 44: Land Use

Considerable attention has been given by the University to ensure that ample open green space is established and the quality of campus open space is well maintained and built upon over time. Through newly established landscape and improvements to existing pedestrian green space, athletic fields, and reallocation of building programs, the University maximizes the impact of campus open space and showcases the many natural and built environments it has to offer.

The proposed master plan identifies approximately 2,135,000 square feet of new building space supporting education and general programs. An additional 1,349,000 square feet to support auxiliary student support programs, along with new auxiliary athletic facilities totaling approximately 640,000 square feet, are also included.

The University aims to further realize its goal as an environmental leader to increase its positive impact on the physical environment and campus community. In support of this goal, the University will endeavor to reduce the extent of turf grass on campus in favor of alternative native and xeriscape shrubs and groundcovers (shade tolerant where required) and designation of areas of naturalized groundplane, to reduce water consumption, fertilizer application and overall mowing maintenance requirements. It is recommended that the University follow the guidelines in "Native Plants for Conservation, Restoration & Landscaping" for Mountain Native Plants from the Virginia Department of Conservation and Recreation. See Appendix for more information.

Additionally, the University supports a healthy and expanding tree stock as a means of: increasing carbon absorption for improved air quality, reducing stormwater runoff and heat island effect on campus, as well as, enhancing the use of outdoor spaces by increasing tree canopy shade.

VIII BUILDING ADJACENCY

THE FINAL PLAN

Solutions to adjacency issues evolved through careful reviews of space needs analysis, user perceptions, and current university trends & markets. Thoughtful interventions maintain and support a balance of the historical character and culture of the existing campus, and the conveniences, necessities, and expectations of the modern day student.

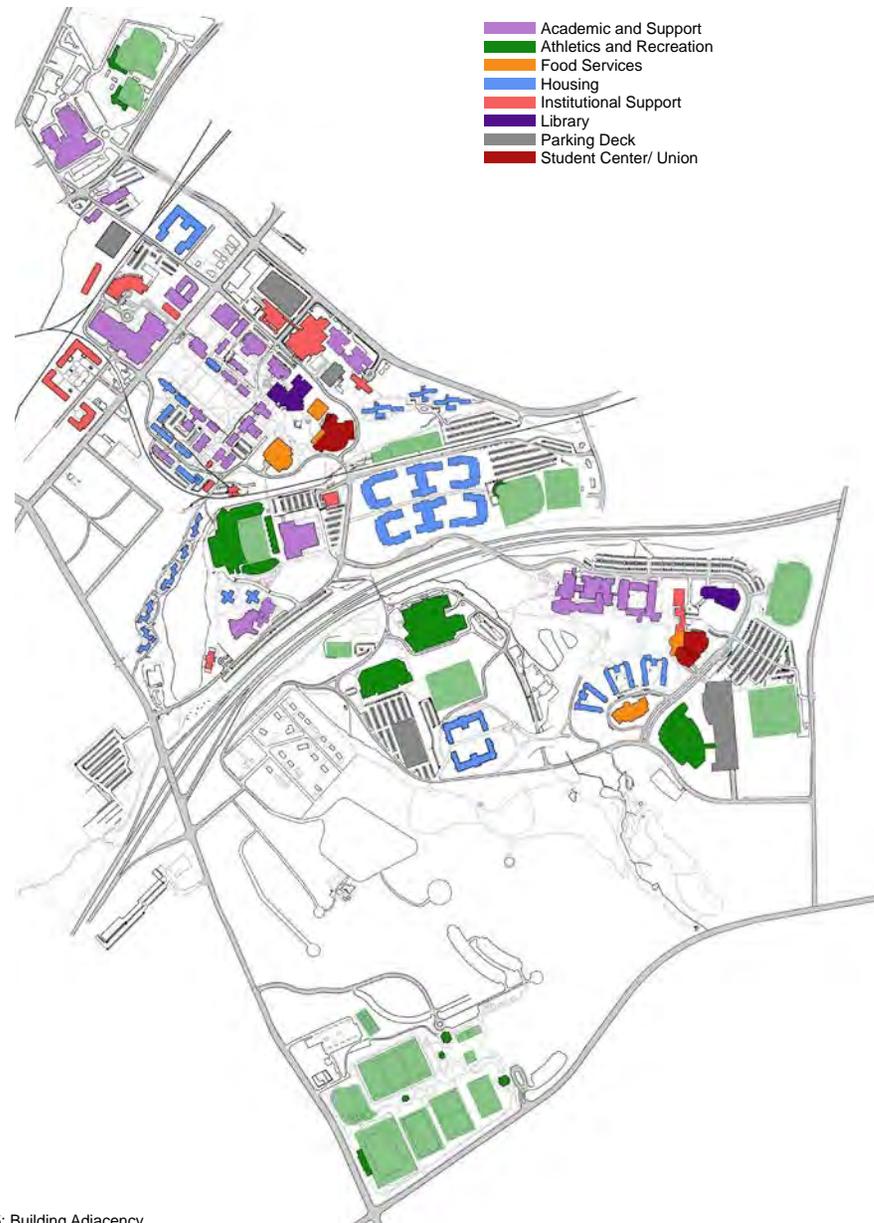


Figure 45: Building Adjacency



The structure of the campus landscape is shaped and defined by the buildings, tree masses, open space, and circulation systems. These elements should combine to establish a clear, easily perceived campus structure. This structure is instrumental in creating a unified campus setting composed of memorable, varied, high quality outdoor spaces that relate to each other and contribute to the overall character of the campus.

The proposed open space framework establishes a cohesive composition of richly varied, interrelated landscapes, that unifies the campus. The denser, more developed, programmed academic and residential landscapes on either side of campus are complimented by the more naturalized, un-programmed, landscapes that connect these areas. Quadrangles, courtyards, and plazas are integral to the developed areas, giving the campus functional urbanity, and creating a variety of places for gathering. Both programmed and un-programmed spaces are illustrated in Figure 46. The proposed plan suggests mass, scale, and density for the campus as a whole.

The campus open space framework is further enriched by the presence of the Arboretum. The master plan calls for a vegetation management plan to preserve and augment the arboretum with restoration planting of native pines and hardwoods (see Landscape Guidelines, Section IX).



VIII PEDESTRIAN AND VEHICULAR CIRCULATION

TRANSIT

Due to the large campus-wide use of the transit system, there is the need for improvements of the routing and frequency of the transit service. This is especially necessary for the high demand corridors of campus, such as Bluestone Drive and Carrier Drive. It is recommended that a bus service and route planning analysis be completed for the entire campus. This analysis would assist with future planning to increase efficiency of the service, and increase frequency in the high demand corridors of campus.

BICYCLE PATHS

There are several possible ways to accommodate bicycles, depending on the various conditions. The most common facility types are: Shared Roadways (signed or unsigned), Bicycle Lanes, Wide Outside Lanes, Shared Lane Markings, and Shared Use Paths.

Bicycle Lanes are displayed as blue dashed lines on Figure 47, many of which are located along campus streets. Several additional Bicycle Lane projects are recommended for off-campus roadways that coordinate with the City of Harrisonburg's Bicycle and Pedestrian Master Plan.

Shared Lane Markings are displayed as red dashed lines on Figure 47, and recommended for narrow campus streets with lower speed limits and fewer vehicles.

Shared Use Paths are displayed as orange dashed lines on Figure 47, most notably along Bluestone Drive and North Main Street, serving as a connection between the existing Bluestone Trail and downtown.

PEDESTRIAN PATHS AND SIDEWALKS

The pedestrian portion of the Plan is comprised of pedestrian paths and sidewalks, which connect existing sidewalk dead ends, connect to transit stops, and indicate heavily utilized (worn) foot paths. A second category of pedestrian projects include intersection improvements, such as the addition of standard crosswalks and associated signage, realignment of intersection geometry, or pedestrian channelization.

Sidewalk improvement projects are displayed as purple-dashed lines on Figure 47. Depending upon the site conditions and the flow of pedestrians through the area, the typical on-campus sidewalk width should range between 6-12 feet.

Recommended intersection and corridor projects (black circles on Figure 47) represent a variety of enhancements that are unique to the site conditions, including the installation or relocation of accessible pedestrian crossing signals, the installation or timing of traffic signals for pedestrian movements, pavement markings, curb cut reconfiguration, and/or pedestrian channelization, for safety and limiting mid-block crossing.

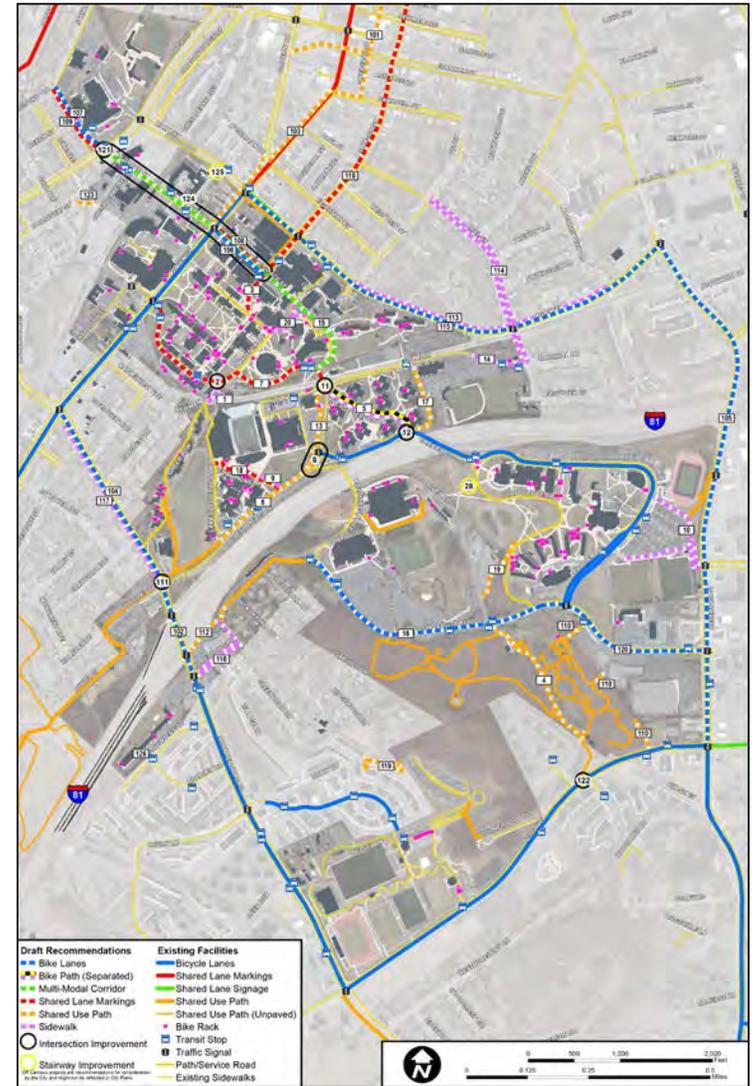


Figure 47: Recommended Transit, Bicycle, and Pedestrian Improvements

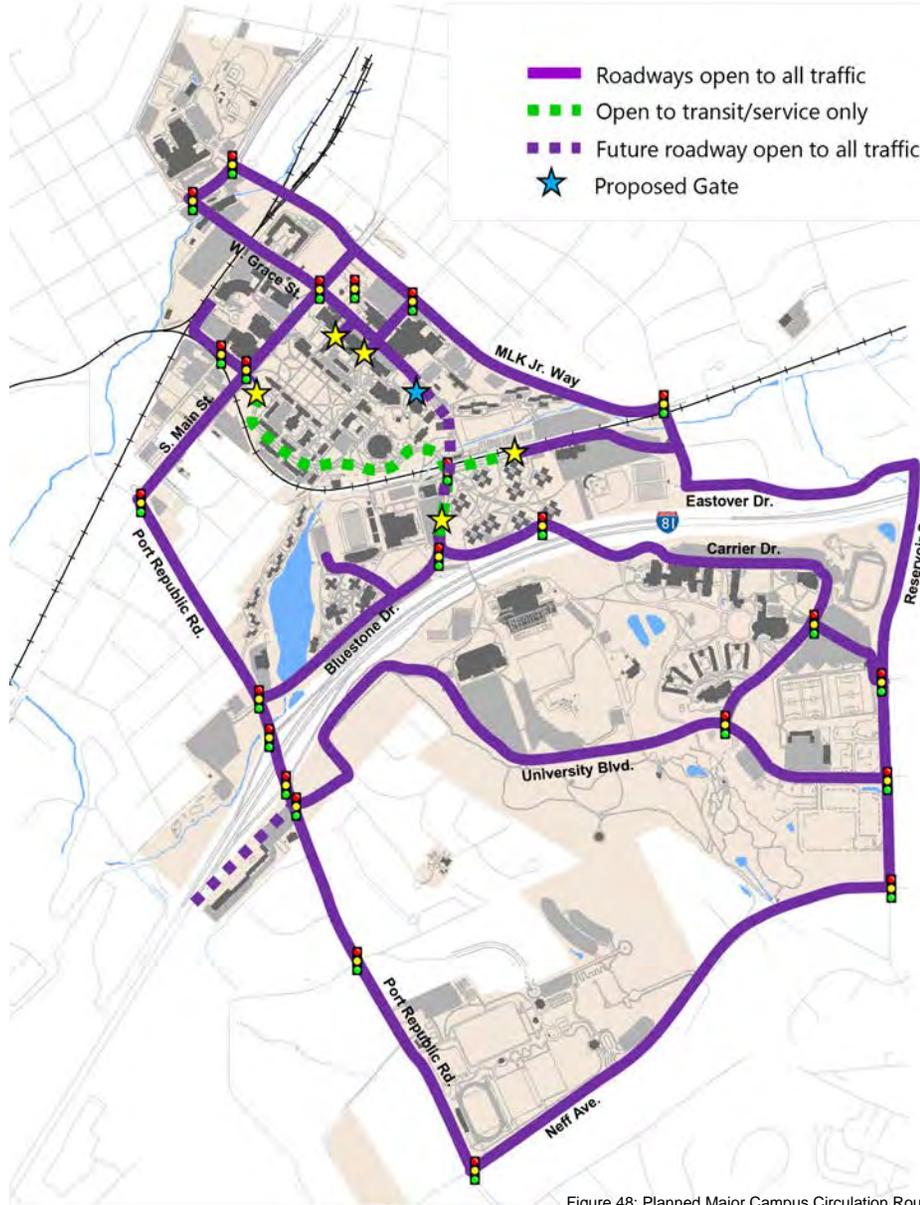


Figure 48: Planned Major Campus Circulation Routes

VEHICULAR CIRCULATION

Currently, there are four projects that are being constructed within or around the JMU Campus. They are the I-81 Exit 247 and Exit 245 Improvements, both adjacent to campus, the Grace Street Extension Project, and the Grace and Mason Street Intersection Improvements, which are internal to campus. These projects are being developed to assist with easing the congestion on some of the major roadways within the general JMU area. The Exit 247 Improvements include replacing the US 33 east to I-81 north loop ramp with a signalized left turn lane ramp access, to decrease the amount of congestion accessing I-81 at this interchange. Directly affecting JMU will be the state Exit 245 Improvement project, consisting of aligning the north-bound off-ramp to the Port Republic Road and Forest Hills Road intersection, with the goal of enhancing JMU access and easing congestion along Port Republic Road.

The Grace Street Extension project is internal to JMU's campus, and will connect Grace Street from the Grace Street Parking Deck to Bluestone Drive, allowing easier traffic flow from the parking garage and eliminating the dead-end to Grace Street. This extension would most likely be gated and only open to transit and pedestrian traffic during the same times as the rest of the campus gates. Directly adjacent to the Grace Street Extension Project is the Grace and Mason Street Intersection Improvements adding left turn lanes to Grace Street, a pedestrian sidewalk and crossings, a signal at the intersection of Grace and Mason Street, and a median and fence along Mason Street to prevent left turns out of the Mason Street Parking Deck towards MLK Jr. Way.

VIII PARKING & ACCESSIBILITY

PARKING

The plan assumes that many of the interior campus parking spaces will be lost to either new building construction, or converted to campus green space. When the projected losses are coupled with projected new demand for parking, the study approximates a deficit of 180 spaces through year 2027 after the projected gains are incorporated.

ACCESSIBILITY

An important goal of this Campus Master Plan is to ensure adequate and convenient accessibility for the mobility-impaired, and for those with other disabilities. This goal is especially important as new parking lots and decks are built, and as existing lots are reconfigured or lost.

Federal regulations require:

“Accessible parking spaces serving a particular building shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance. In parking facilities that do not serve a particular building, accessible parking shall be located on the shortest accessible route of travel to an accessible pedestrian entrance to the parking facility.” (Code of Federal Regulations, ADA Standards for Accessible Design, Appendix A to Part 36, Sec. 4.6.2.)

In addition to federal regulations, the following issues should be considered when existing parking lots are reconfigured or lost:

- Maintaining a convenient, accessible route from accessible spaces; accessible parking spaces should be no further than 250 feet from the nearest accessible building entrance
- Relocate displaced accessible spaces to the closest accessible parking area
- Consider terrain issues and other accessibility barriers (streets, landscaping, etc)
- Maintain an adequate overall number of accessible spaces to serve campus sub-areas
- Work with JMU Office of Disability Services to plan space location and routes

PROJECTED FUTURE CONDITIONS

Students, Faculty & Staff (Headcount)	28,411
Ratio (spaces : total population)	0.47
New Demand (spaces)	13,353

PROJECTED PARKING SUPPLY & DEMAND

Current Parking Spaces	12,191
Spaces Lost Due to Committed Projects	2,098
Gains (Convo. Deck, Ches. Ave. Deck, & Other Planned Projects)	3,081
Net Current Supply	13,174
Projected Demand	13,353
Surplus/(Deficit)	(179)

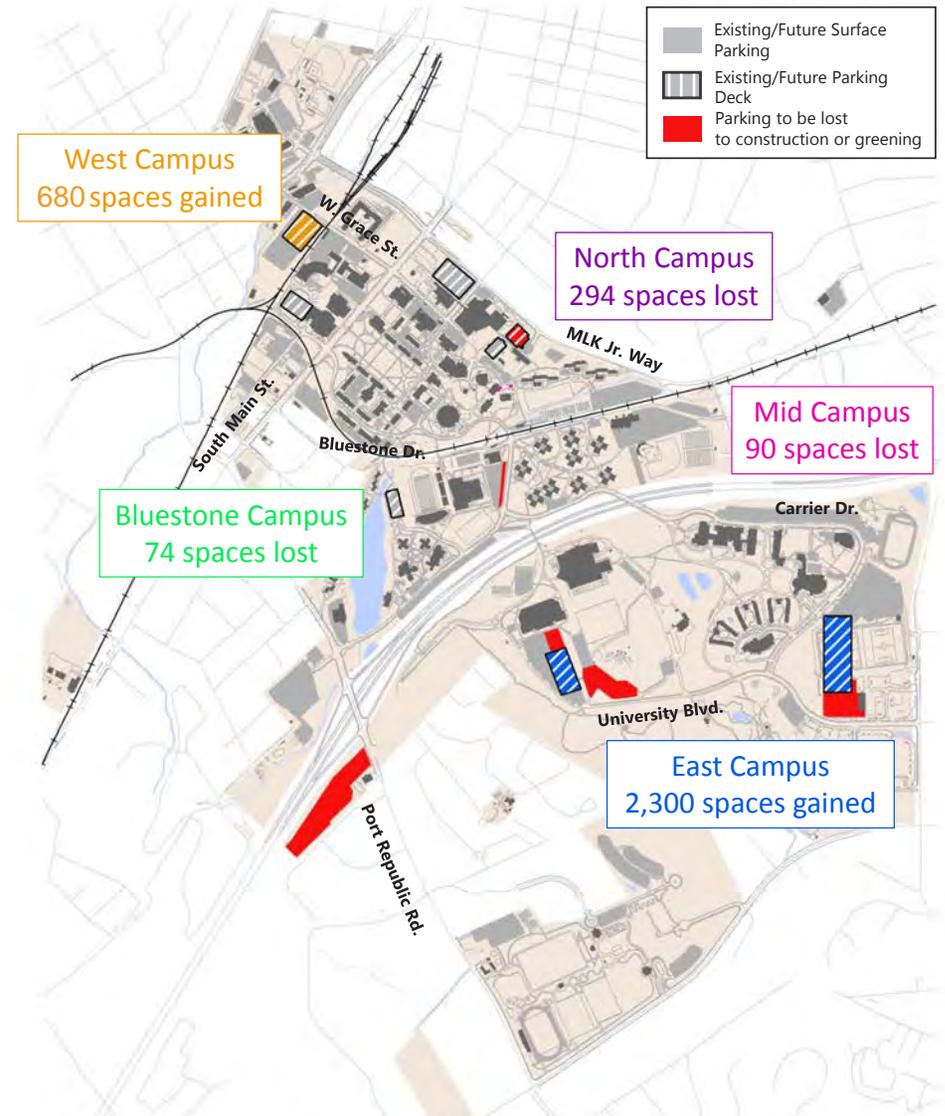


Figure 49: Planned Parking Improvements

BLUESTONE QUADRANGLE AREA

New construction:

- 1 • 26,000 GSF addition to Moody Hall
- 2 • 56,200 GSF Carrier Library Addition and Renovation



Figure 50: Planned Bluestone Campus Improvements

VIII THE BLUESTONE CAMPUS - BUILDING & LAND USES

1 26,000 GSF MOODY HALL ADDITION

The 3-story, 26,000 GSF addition to Moody Hall will provide the needed program spaces for the College of Arts and Letters. Major new program spaces include state of the art classrooms, Meeting and conference rooms, along with faculty offices and support spaces. A glass-like connector links the new addition to Moody Hall. The massing of the new addition is appropriately scaled to the existing hall. The 3-story connector serves as circulation and informal study space. The new building is clad in bluestone with appropriately scaled punched windows along with sections of curtain wall glazing. The roof features a terra cotta tile that matches roof systems in Bluestone campus.

2 56,200 GSF CARRIER LIBRARY ADDITION AND RENOVATION

This new 56,200 GSF addition and phased renovation to Carrier Library will provide JMU a prominent research library and a campus landmark that engages the surrounding historic Bluestone campus fabric. The addition and renovation of Carrier Library will advance JMU's academic goals and signature programs. It will improve resources and services that directly impact the success of JMU's students, including technology rich, interactive spaces for teaching, learning and innovation, varied student study space environments for independent and collaborative work, and curricular engagement with the University's unique heritage collections.

Carrier Library sits in a critical location on campus: the intersection of JMU's historic campus quad and the North Campus area. The design of Carrier Library addition and renovations has the potential to create a cohesive plan and form out of the presently disparate collection of library building components, as well as to knit together the surrounding campus environment.





Demolition of Chandler Hall, demolition of existing Phillips Hall, and demolition of existing Village Housing.

With the University's recent acquisition of the property to the west of Newman Lake, Lakeview Hall should be considered as a significant building site that reflects the architecture of JMU's campus.

New construction:

- 1 • Lakeview Hall Alterations
- 2 • Sonner Hall Additions
- 3 • Addition and renovation to the College of Business *
- 4 • Phillips Hall Replacement *
- 5 • Madison Union Expansion and Modernization
- 6 • 6 Village Residence Halls, 2,400 -2,800 beds

* projects currently in design

Figure 51: Planned Mid Campus Improvements

VIII THE MID CAMPUS - BUILDING & LAND USES

1 LAKEVIEW HALL ALTERATIONS

Recladding portions of the existing facility, with the possibility of a small addition to the south, to bring the building more in line with the JMU Mid-Campus architectural language.



Lakeview Facade Alterations



Lakeview Facade Alterations and Addition





2 SONNER HALL ADDITIONS

9,000 GSF of additional space to the existing Sonner Hall will be added with two small additions. The renovation and expansion will house a portion of University Advancement.

3 COLLEGE OF BUSINESS

The 114,757 GSF addition to the College of Business will connect seamlessly to the refurbished Showker Hall, for an over 211,000 GSF College of Business complex. The new construction will be configured to maximize views of Newman Lake and the Shenandoah Mountains, and create an outdoor event terrace dedicated to the College of Business for student, alumni, and community outreach activities. The new addition will provide much needed classrooms, incorporating a wide variety of flexible configurations to maximize student collaboration and entrepreneurial activities, while incorporating state-of-the-art technologies, connecting the College to their education and business partners around the world. A 225-seat dining facility available to the entire campus population, will be incorporated to serve the students within this precinct of the Mid Campus area.



VIII THE MID CAMPUS - BUILDING & LAND USES

4 PHILLIPS DINING HALL REPLACEMENT

The new 39,200 SF state-of-the-art dining facility will replace the existing Phillips Hall facility within its current footprint. Located just south of the proposed Grace Street Extension, between Grafton Hall and Carrier Library, the new facility will provide 900 indoor seats, thus expanding the existing dining capacity by approximately 425 seats, as well as 200 exterior seats, for a total of 1,100 retail dining seats.

5 MADISON UNION EXPANSION AND MODERNIZATION

Madison Union should be expanded and modernized to better suit the needs of the growing student body. 84,000 GSF of expanded construction, along with 70,000 GSF of renovation, will serve to address an existing deficit in student union space on the campus, as well as providing additional assembly/exhibit spaces to address deficits in those areas. The expansion and renovation will also enhance the functionality of student services, clubs, organizations, and programs that support the educational mission of the university.

6 VILLAGE RESIDENCE HALLS

The “Village Housing” complex is centrally located on the JMU campus between the historic Bluestone campus and the newer East campus. The housing complex includes (6) separate 4-story resident halls that house a total of 2,800 students. See page 99 for more detailed information regarding future Village Residence Halls.

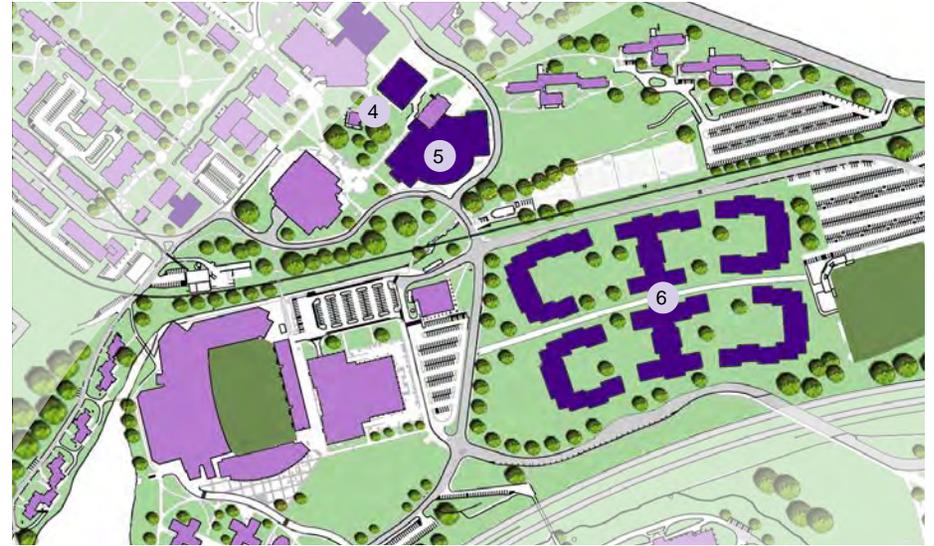




Figure 52: Planned East Campus Improvements

Demolition of surface parking and softball field, and renovation of existing convocation center.

New Construction:

- 1 • 177,000 GSF College of Science and Mathematics Addition(s)
- 2 • 72,000 GSF College of Integrated Science and Engineering Addition(s)
- 3 • 30,000 GSF University Advancement Addition
- 4 • 50,000 GSF Festival Conference and Student Center Addition
- 5 • 60,000 GSF Library Addition
- 6 • 8,500-Seat Convocation Center*
- 7 • 1,500 Car Parking Garage
Access roads & loading zone*
- 8 • 1,000 Bed East Campus Housing Complex**
- 9 • 800 Car Parking Garage

* convocation center and parking deck currently under design

** 500 bed student housing building currently under design

VIII THE EAST CAMPUS - BUILDING & LAND USES

1 COLLEGE OF SCIENCE AND MATHEMATICS

The 177,000 GSF College of Science and Mathematics building addition(s) will include state-of-the-art undergraduate teaching laboratories, as well as both formal and informal learning spaces that encourage discovery and support problem-based learning, technology-enhanced active learning environments, lecture halls, classrooms, faculty offices, and learning center spaces. The site precinct is located at the northern edge of East Campus. The new state-of-the-art research and teaching spaces for math and science, are strategically located adjacent to the Skyline quad, that features both academic and residential precincts. The site plan layout creates an opportunity to form a new gateway entry to East campus. The new entry atrium and adjacent informal learning spaces will create a memorable entry experience with 'chance encounters' for interaction between students and faculty. Additionally, the south side of the courtyard features a portal opening that draws pedestrians to and from the adjacent Skyline quad.

2 COLLEGE OF INTEGRATED SCIENCE AND ENGINEERING

The 72,000 GSF College of Integrated Science and Engineering addition(s) continue the trend of bringing multiple science departments under one roof, while simultaneously serving as a campus destination. The new, central, entry atrium is a multistory "interaction engine," and should welcome sciences and non-science students alike, while facilitating cross-campus connections. The building's design should provide memorable venues for study and collaboration. New spaces will also feature high-tech labs to allow students to practice problem-solving in many scenarios. The building addition(s) are composed of: high-energy, interdisciplinary lab research wings, and low-energy, faculty office/student collaboration wings. The Courtyard and outdoor spaces offer unique outdoor environments for student gathering, collaboration and teaching.





3 LEEOLOU ALUMNI CENTER

The 2 and 3-story 30,000 GSF Leeolou Alumni Center addition helps serve as the focal point for alumni activities at JMU. The current alumni center houses the Office of Alumni Relations, as well as the JMU Office of Development. New program space would include: Advancement Information Services, Communications and Marketing, Campaign Management, Development and Call Center, Principal Relationships Development, Foundation, and Commons area. Both levels of the addition would feature outdoor event space, and provide views back toward the Bluestone campus.

4 FESTIVAL CONFERENCE AND STUDENT CENTER

The 2-story, 50,000 GSF addition to the Festival Conference and Student Center creates a sense of arrival on East Campus. The imposing 2-story, curved, modern form addition with large windows creates, a sense of welcoming on the main level. A 2-story entry atrium connects to the Commons and offers flexible event and community space, study spaces, and additional informal lounge space. Major program spaces include conference and ballroom spaces that can be divided into different sized event space. New food service program space would be required to assist the catering requirements of the new ballroom event space.

5 ROSE LIBRARY

The 4-story, 60,000 GSF, seamless addition to Rose Library gives the East Campus section of JMU a state-of-the-art library and campus landmark that contextually fits into the surrounding campus fabric. Major program spaces that would supplement the existing library programs would include an event forum for presentations, display and demonstration areas, meeting rooms of varying sizes, collection(s) display areas that encourage discovery, staff and support areas, and a mix of lively and contemplative spaces that support imaginative and flexible programming. The library embraces JMU's environmental commitment. Environmental stewardship is expressed in the use of LEED standards in its design including: the generous use of natural light, energy-efficient systems, reduced water use, and the preservation of an existing grove of trees at the south of the site.



VIII THE EAST CAMPUS - BUILDING & LAND USES

6 8,500-SEAT CONVOCATION CENTER

The 8,500-seat convocation center will help elevate the national profile of JMU and the Shenandoah Valley. The convocation center will play host to many events each year, including basketball games, public speakers, University convocation and graduation, concerts, conventions, trade shows, family entertainment options, and local high school graduation ceremonies. The convocation center will be the largest event space in the Shenandoah Valley, and will feature premium seating areas similar to Bridgeforth Stadium. The basketball operations facility will be attached to the arena, and will serve as the home of the JMU men's and women's basketball programs. These facilities will include offices, locker rooms, training spaces, meeting rooms, and a full-court practice facility. Anticipated completion date for the new facility is November 2020.

7 1,500-CAR PARKING GARAGE

A 1,500-stall parking structure will provide parking for the various functions of the convocation center. Anticipated completion date for the new garage is November 2020.

8 1,000 BED EAST CAMPUS HOUSING COMPLEX

See 'The Final Plan - Housing' on page 96 for more detailed information regarding future East Campus Housing Complex.

9 800-CAR PARKING GARAGE

The parking garage will help JMU reach their future parking demand, and will be situated on an existing surface parking lot.



WEST CAMPUS

New construction:

- 1 • 2-Story 20,000 GSF University Programs Building
- 2 • 3-story 60,000 GSF College of Visual and Performing Arts Building
- 3 • 3-story 50,000 GSF Design Museum
- 4 • Future Administration / Academic Buildings
3 Building Sites



Existing Construction
New Construction

Figure 53: Planned West Campus Improvements

VIII THE WEST CAMPUS - BUILDING & LAND USES

1 UNIVERSITY PROGRAMS

The 20,000 GSF, 2-story University Programs building is located on Main Street just north of The Forbes Center for the Performing Arts. Program space in the building includes: a 2-story lobby, event space (for 100), a testing center, classrooms, conference rooms, and administration offices and support space. The new, standalone building is a bluestone clad structure that takes its architectural cues from the Forbes Center.

2 COLLEGE OF VISUAL AND PERFORMING ARTS

The 60,000 GSF, 3-story College of Visual and Performing Arts building is located on Main Street just north of The University Programs building. Academic programs moving into the proposed building include: Interior Design, Graphic Design, and Architectural Design. Major program spaces include studio lab spaces, classrooms, meeting and conference rooms, and faculty offices and support space. The bluestone clad structure takes its architectural cues from the Forbes Center and Duke Hall. The building has a direct interior connection with the new Design Museum, which sits just north of the site.

3 DESIGN MUSEUM

The 50,000 GSF, 3-story Design Museum is located on Main Street just north of, and is connected to, the College of Visual and Performing Arts building. Major program space in the building includes: a 2-story entry lobby, adjacent event space, a welcome center, (12) galleries, gallery storage, administrative offices and support space, a café, and gift shop.

4 FUTURE ADMINISTRATION / ACADEMIC BUILDINGS

There are three building sites for future programmed space, located to the southwest of the Forbes Center.



Demolition of Cantrell Avenue Parking Deck.

New Construction:

- 1 • 5-story, 120,000 GSF College of Health and Behavioral Studies Building



Figure 54: Planned North Campus Improvements

VIII THE NORTH CAMPUS - BUILDING & LAND USES

1 COLLEGE OF HEALTH AND BEHAVIORAL STUDIES

The College of Health and Behavioral Studies' addition is a 5-story, 120,000 GSF project to the southeast of the newly constructed East Tower project. A transparent, 3 level circulation bridge will connect the two buildings at levels 2 - 4. Major program spaces in the project include community-oriented, state-of-the-art clinic space, along with administrative support spaces. A new patient drop-off area will be located between the new building and the existing Grace Street parking deck. Patient families and caregivers will be provided dedicated parking in the existing deck. The buildings public activity will be very visible from MLK Jr. Way, and pedestrian paths and open spaces will flank it. The New College of Health and Behavioral Studies addition embraces JMU's environmental commitment. Environmental stewardship is expressed in the use of LEED standards in its design including: the generous use of natural light, energy-efficient systems, reduced water usage, and an overall compressed footprint to minimize site disturbance.





VILLAGE HOUSING

The “Village Housing” complex is centrally located on the JMU campus between the historic Bluestone Campus and the newer East Campus. The housing complex includes (6) separate 4-story resident halls that house a total of 2,800 students. One of the residence halls will include program space for the JMU Residence Life administrative staff. The new Village will provide incoming freshman students comfortable suite-style housing with shared commons and informal study spaces. Additional program spaces include: limited living learning space, laundry area, study rooms, and select food service programs. An active pedestrian ‘Main Street’ traverses the site and divides the Village complex, and is activated by first level public program spaces including informal student study space, meeting rooms, retail food venue space, and student common areas. Tiered outdoor terraces that extend from the interior spaces outside further serve to animate the ‘Main Street’ experience.



EAST CAMPUS HOUSING

The East Campus complex is located in the Southeastern section of JMU's campus. It is located off of University Blvd. on the old softball field site, and is adjacent to the UREC multipurpose playing fields. The site will house up to 1,000 beds, 500 of which are currently in design, and is eventually seen as apartment-style, upperclassmen housing. The new housing complex will provide students comfortable housing with shared commons and informal study spaces. Additional program spaces include: limited living learning space, study rooms and select food service programs.

VIII ATHLETIC & RECREATIONAL FACILITIES

The 2008 Comprehensive Campus Master Plan designs envisioned impressive new intercollegiate and recreational athletic and recreation facilities at designated areas throughout the campus. The completed field improvements have worked to enhance student life and wellness, student and faculty recruitment, and the image and competitiveness of the University's athletic and recreation programs. A majority of the 2008 plan recommendations have been implemented with minimal changes.



The Bridgeforth Stadium Expansion was completed in July 2011.

Features of the expanded stadium included:

- The demolition of the existing West Stands (Home side) of Bridgeforth Stadium, and the reconstruction of a two-tiered complex in its place.
- Construction of 4,200 permanent seats, restrooms, and concessions in the north end zone.
- Additional seating totals 9,100, bringing total capacity to 24,878.
- New premium seating, such as suites and club seats.
- Additional seating that complies with the Americans with Disabilities Act.
- Increased fan amenities such as concourses, concessions, and restrooms.
- Relocated press box in the west stands.
- Increased stadium lighting.



The UREC Addition and Renovation was completed in December 2015.

Features of the addition and renovation included:

- A therapy spa.
- An expanded exercise equipment room.
- An adventure center containing an instructional climbing wall, expanded rock wall, a bike repair shop, as well as indoor storage for adventure gear, and outdoor storage for canoes, kayaks, and bikes.
- An elevated indoor running track.
- Synthetic athletic fields to the south of UREC.



The new Convocation Center is currently in design, with an expected completion date of November 2020.

Proposed features include:

- 8,500 seating capacity.
- Basketball operations offices.
- Training facility for both men's and women's basketball programs.
- 1,500 space parking garage



The University has already constructed an athletic/recreational sports complex at the Port Republic site from the 2008 Comprehensive Campus Master Plan. This site is used for intercollegiate athletics for soccer, lacrosse, and track and field. The site is also the location of the intercollegiate athletic offices, locker rooms (for the sports located at this site), training rooms, and support functions for these sports. The Athletics side is the southern half of the site and includes two buildings. The first is an outdoor Athletics Gatehouse, which is the entry point for the general public to the athletics site, and the second is an outdoor Athletics Pavilion.

The intercollegiate soccer and lacrosse teams share a performance stadium, which is surrounded by an outdoor track and field complex. The stadium is capable of seating up to 1,500 spectators with a central, enclosed press box, storage, and restrooms. The site also includes two practice fields for soccer and lacrosse. In between the athletic fields to the south and UREC fields to the north is the shared concessions building. It is designed to serve both fields for events, with concessions and restrooms for each side.

The site development includes selected university recreation and club sports fields. The recreation and club sport multi-purpose fields provide facilities for two soccer fields, two flag football fields, a walking trail, a gatehouse, recreation, and club sport support building with men's and women's changing rooms, restroom facilities, equipment storage, etc. Adjacent to these facilities are two outdoor sand volleyball courts, four outdoor tennis courts, two outdoor basketball courts, rugby fields, and a ropes course.

VIII THE UNIVERSITY FARM

THE FINAL PLAN

The farm is currently being used to conduct research for some faculty-sponsored projects, and for select University-sponsored social gatherings. At this time, future plans for this property call for these uses to continue at the site.

Recent improvements to the site have included efforts to stabilize the house on the property, updated and improved parking, and renovations to the amphitheater.



The primary and secondary signage location recommendations are based on both vehicular and pedestrian circulation patterns. These are general, local suggestions, and specific locations should be determined by a detailed site analysis of each area and or project.

The following is a brief summary of suggestions that the University should implement. Additional findings and recommendations can be found in the Transportation Guidelines described in the Campus Design Guidelines and Standards section of this document.

- Implement a Campus Gateway Signage System and identification signs. A pre-engineered, extruded aluminum system is recommended. This system should consist of interchangeable panels that can be easily altered to accommodate campus evolution.
- Work with VA Department of Transportation to provide guide signs at all interstate exits and vehicular approaches to the University.
- Work with City of Harrisonburg to provide new guide signs at applicable intersections and roads to direct traffic to various campus destinations.
- Provide vehicular directive signs and identification signs for all visitor nodal parking areas.
- Provide orientation kiosks at all nodal parking areas.
- Add maps to transit shelters.
- Implement all building identification signs, and install code required building numbers.
- Change out all campus street identification to signs using the new signage standards.
- Revise all wheelchair accessible route signs to include building name and relocate, if necessary, to more clearly define these pathways.
- Construct new Visitor Information Centers.
- Provide orientation kiosks at all pedestrian gateways and other academic neighborhoods, as required.
- Replace all reserved parking area signs on campus using the new signage standard.

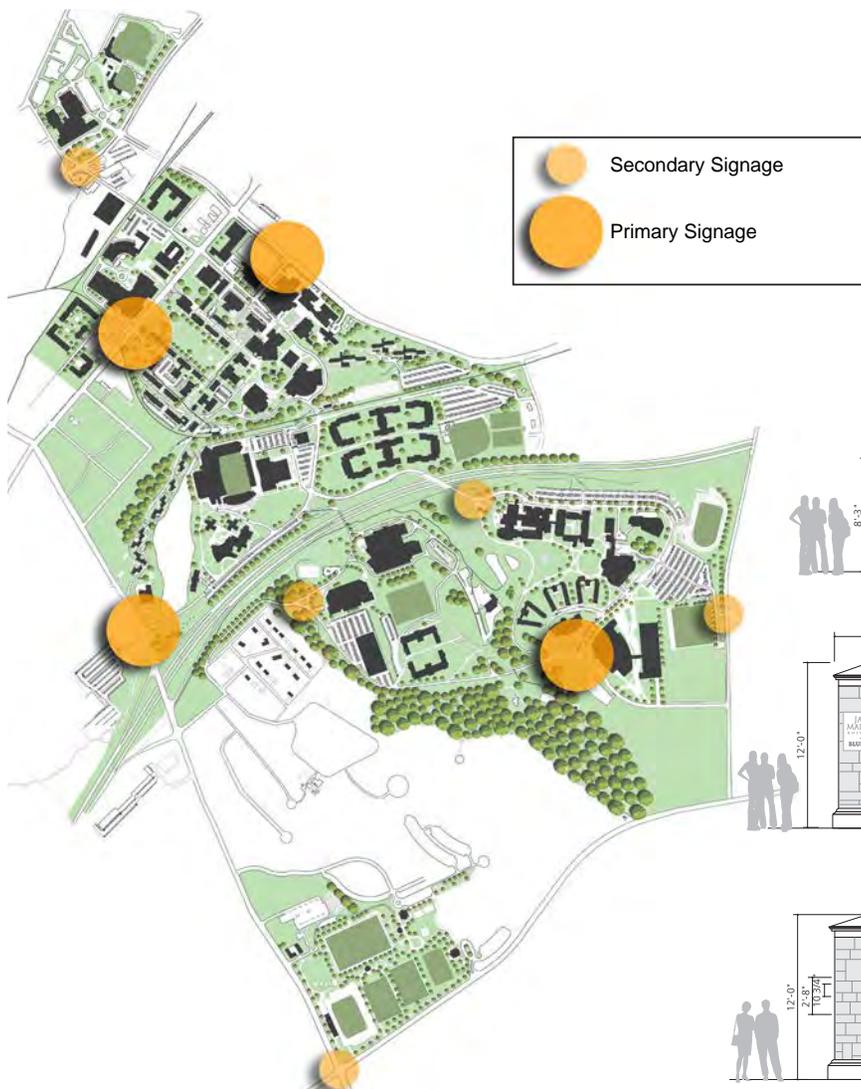


Figure 55: Planned Campus Signage Improvement Locations

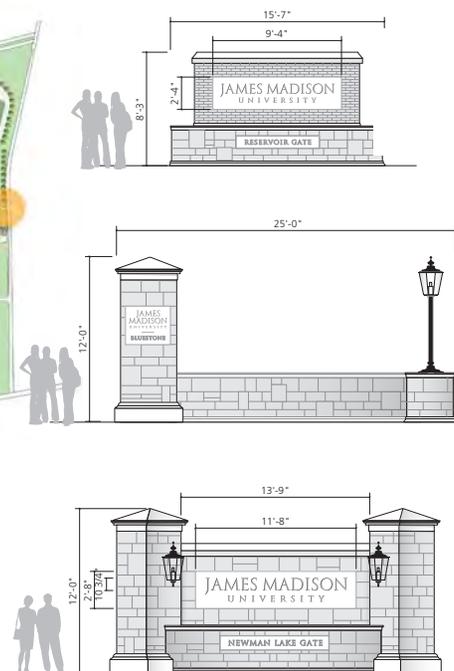


Figure 56: Planned Campus Gateway Signage Improvements

VIII SIGNAGE

The following signage illustrations are proposed updates to the campus wayfinding system for both vehicular and pedestrian circulation, building identification, and parking lot information.

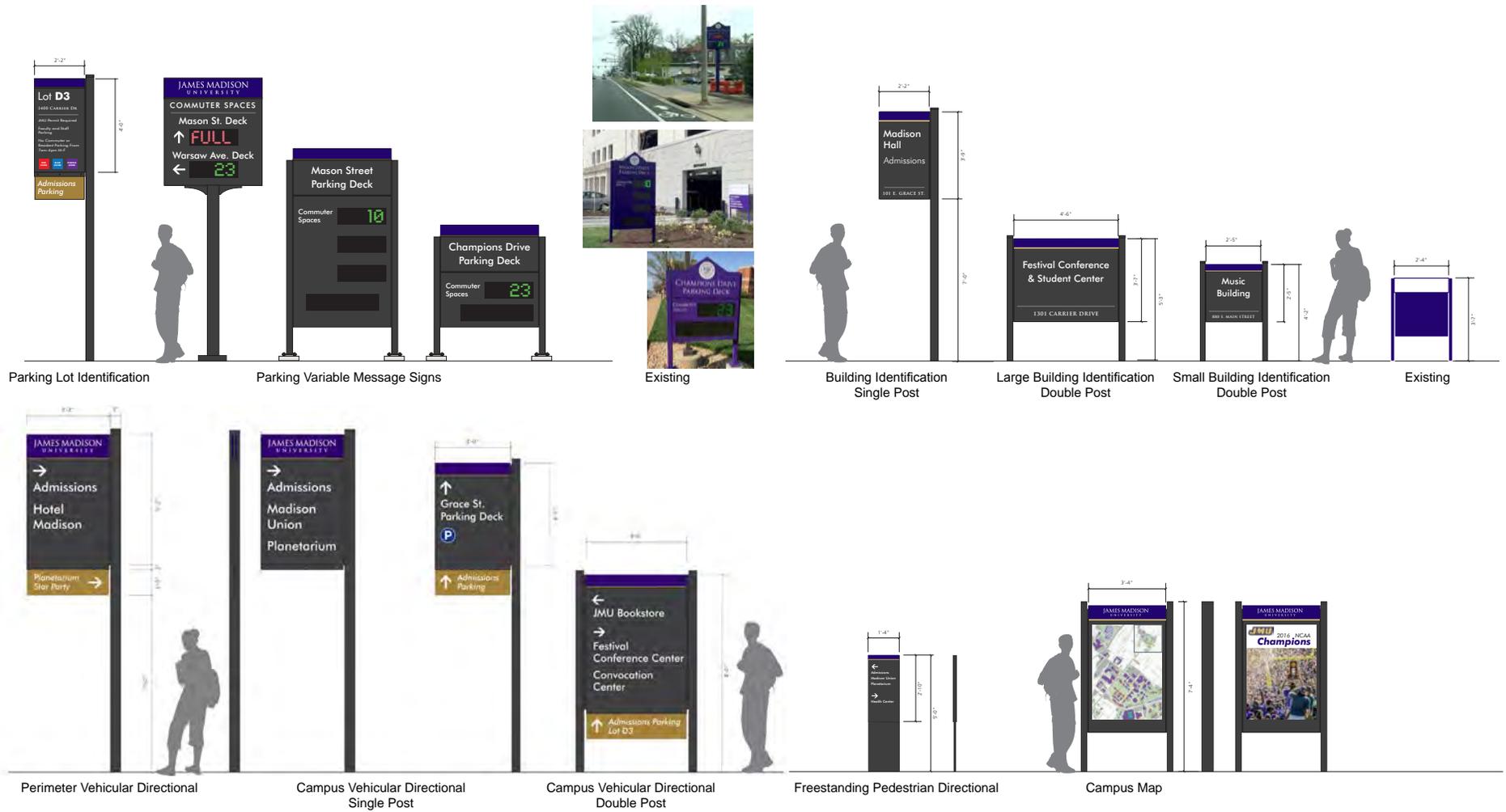


Figure 57: Planned Campus Wayfinding Signage Improvements

As projects are proposed, the designers will need to evaluate the water and sewer systems as needed to determine the required system conditions for each project. This may require downstream analysis, or extensive modeling in certain situations, to mitigate any potential downstream effects from the new development.

POTABLE WATER RECOMMENDATIONS

Recommendations for future water system planning include evaluating each future project site for the possibility of utilizing one of the campus master meters to monitor the water usage. Two meters are installed on campus and can be used for future projects. Where it is possible, multiple future development projects should be preliminarily studied to approximate the needs of a new precinct of campus. This will enable a future project to install a system that can eventually be used by multiple future developments, decreasing the need for a full system replacement at full build-out.

SANITARY SEWER RECOMMENDATIONS

It is recommended to evaluate the material of the existing sanitary sewer system during the preliminary design phase of future projects, and replace any terracotta pipe within the project development limits. As multiple design projects are designed to be built within a similar precinct of campus, it is recommended that flow values be calculated for each project site to assist in determining if the existing system will have capacity for the full build-out. Any needed upgrades to the system will be able to be accounted for early in the process, and possibly eliminate limitations on future development.

STORM SEWER RECOMMENDATIONS

It is recommended to evaluate the existing storm sewer network within the project development limits during preliminary design to approximate any design conflicts that may impact the future development of the site. Stormwater design is a complex part of site design and preliminarily planning, such as within the Stormwater Master Plan, and can assist with avoiding potential constraints later in design. Any needed upgrades to the system should be planned for early in the process, and possibly eliminate limitations on future development.

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CAMPUS MASTER PLAN UPDATE 2017

IX BUILDINGS BY TYPE

ENVISIONING THE FUTURE

James Madison University's vision for the future is to maintain and continue to establish its reputation for offering students an engaged collegial experience. Over the next 10 years, the master plan identifies several projects and strategies to assist the University in meeting both long and short term goals.

Collectively this master plan identifies:

- Building locations, approximately 2,573,000 square feet, supporting both educational and general programs.
- Strategies to modernize the Village Residence Halls and meet the University's housing targets.
- Parking opportunities to maintain current parking ratios.
- Opportunities and strategies to improve pedestrian and vehicular circulation, open green spaces, campus identity and culture, and wayfinding systems.



Figure 58: Buildings By Type

PURPOSE, PRINCIPLES & GOALS

As part of this 2017 master plan update initiative guiding the development of the campus, the University requested Moseley Architects to begin a set of design guidelines for all five major campuses making up the collective James Madison University.

The purpose of the guidelines is to coordinate and orchestrate the overall development of the University campuses, in an effort to bring continuity amongst the quality and character of the built environment. The intention of the guidelines is not to restrict design and creativity, but to enhance the campus experience and sense of place through methods and materials of building and design.

The guidelines address many issues which affect the quality of life and the spirit of James Madison University. Some of the primary issues are:

- Sustainable transportation
- Location and orientation of on-site parking
- Architectural vocabulary
- Pedestrian comfort and activity at street level
- Incorporation of signage and civic art
- The design of public spaces
- Preservation and creation of quality building stock
- The continued creation of a unique campus

The guideline goals may contrast many of today's standards of development that lend themselves toward larger scale, automobile-oriented projects and environments. These can stifle a collegiate atmosphere by minimizing the potential for continuity on the street/ground level, thus changing the social activity and culture of the University. These guidelines are presented as a challenge to contemporary development, and to the designers, builders and planners of the University as they look for ways to shape and reshape the University's growth within the greater community.

Similar to the master plan, this set of guidelines is intended to become a living document to best serve the University. The recommended design principles stated in this text are categorized into systems that can and should be manipulated and updated as the change of needs, requirements, and the inevitable evolution of the University take place.

- Urban Design
- Architectural Design
 - Bluestone Campus
 - Mid Campus
 - East Campus
 - West Campus
 - North Campus
- Transportation Design
- Landscape Design
- Maintenance & Construction Standards & Guidelines

These elements have an inherent ability to either enhance or diminish our experiences in the built and natural systems in which we live, work, and play. While each component is interdependent, they are conventionally segmented within this text to suit implementation and updating processes. The ultimate goal of these guidelines is to promote holistic design that considers context, climate, and the overall communal / human experience.

These guidelines will in no circumstance supersede any of the following:

- Federal, State, and or all State Codes, Requirements and Regulations
- Leadership Through Environmental Design guidelines and or applicable standards



Figure 59: Campus Design Guidelines

IX CAMPUS DESIGN GUIDELINES & STANDARDS

IMPLEMENTATION

URBAN DESIGN

The essential public spaces of any area within campus, be they by design, built, interstitial, or a means to accomplish a necessary function or perception, can benefit substantially through thoughtful design. These places can set the tone for several systems. They require careful attention to adjacency, density, usage, building profiles and types, hardscaping materials, and design, lighting, pedestrian, vehicular, and wayfinding signage and outdoor furnishings.

TRANSPORTATION DESIGN

Infrastructure relating to transportation, with an emphasis on roadways, transit systems and facilities, sidewalks, bike paths, curbing, signalization systems, gating, roads, pavement, and vehicular signage.

ARCHITECTURAL DESIGN

The design of buildings, monuments, plazas, promenades, and other structures, offering function and form to public and private spaces. Included in this section are specific instructions for the handling of historic projects. The guidelines recognize five distinct areas of campus:

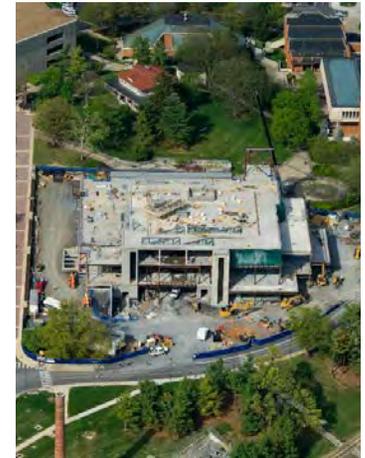
- Bluestone Campus
- Mid Campus
- East Campus
- West Campus
- North Campus

LANDSCAPE DESIGN

The arrangement of trees, shrubs, ornamental grasses, groundcovers and perennials within the campus, define the shape and character of campus spaces and the public campus edge. Campus landscape considerations require close attention to accessibility, campus image, and community interface, and will provide a positive impact on the sense of place.

MAINTENANCE & CONSTRUCTION STANDARDS

Metcalf, Tobey & Partners assembled a set of Construction & Maintenance Standards in 1993 for the CISAT campus. These standards can be applied to the entire campus and should be updated on a regular basis. Leadership in Energy and Environmental Design (LEED) standards and recommendations are adhered to where applicable.



This section of the guidelines is intended to steer, encourage, and inspire campus designers and decision makers in creating and maintaining successful urban environments. The master plan recommends an increased investment in the University's practice of "placemaking" with an understanding of the many opportunities that focused urban design efforts lend to the entire community. Thoughtful creation of various public spaces, such as parks, plazas, courtyards, pavilions, and the like should be centered around the many dynamics of the pedestrian, community cultures, natural, and the built environmental characteristics.

SAFETY

The University may consider the use of crime prevention through environmental design (CPTED) concepts and principles to improve the overall campus safety. Specific areas concerning safety may also be referenced in the University's comprehensive safety plan.

PUBLIC ART

Utilize local and collegiate art programs to develop public displayed art concepts and individual pieces into parks and other urban public and private spaces.



TERRACES, COURTYARDS AND PLAZAS

All major entrances to buildings, as well as plazas, terraces and other special areas either contiguous or adjacent to campus buildings, are to utilize special pavements which are coordinated with the architecture of the contiguous and/or adjacent buildings.

Pavement: Unit paver systems. Stamped or Imprinted materials are not acceptable. Systems must be able to support service and/or emergency and fire vehicle access.

Materials: Concrete or stone (bluestone, granite), to match architectural guidelines.

Dimension: maximum dimension for each paver is two feet.

Color: Pavement is to have a pattern of a minimum of two colors and a maximum of four, with no area greater than 100 square feet with one contiguous paver; colors will generally be of a lighter tone than the adjacent contiguous architecture; natural or gray stone.



SITE FURNISHINGS

All campus areas are encouraged to provide functional and attractive pedestrian-oriented furnishings to their environments. While design uniformity amongst all campuses is not required, these objects should be manufactured using the same materials and finishes, with the exception of functional art or sculpture.

All site furnishings are required to be built for comfort, using simple, sturdy construction, which promotes longevity, ease of maintenance, and proper drainage of rain and snow. ADA compliant options are mandatory.





BENCHES, CHAIRS, AND TABLES

Benches and chairs are to be located to encourage utilization of courtyards, plazas, terraces, and other outdoor environments. Outdoor or semi-enclosed areas are required to provide seating locations laid out in a contextual relationship to buildings and transit areas. Sun, wind, and shading considerations must be taken into account. Where appropriate, seating arrangements may be acquired through the use of stepped walls, stairs, balustrades, and other forms of creative informal groupings.

Tables, pedestals, and bases are to articulate with chairs and benches where appropriate and necessary.

Materials: Bluestone, limestone, wood, granite, and precast concrete.

Dimensions: Round maximum diameter 5'-0"
 Square maximum 4'-0"
 Rectangular maximum 4'-0" x 6'-0"

Finishes: For granite, lightly hammered and honed; natural cleft and sawn for bluestone; sawn and honed for Limestone; lightly sandblasted cast concrete



TREE GRATES

Tree grates are used where planting must occur within a paved and or high traffic area.

Material: Cast iron
 Dimension: Minimum 5'-0" square or diameter
 Color: Black

TRASH RECEPTACLES

Receptacles are required within reasonable distances to building entrances, gathering areas, and transit locations.

Materials: Powder-coated aluminum
 Color: Polished silver, black



BICYCLE RACKS

Located on paved areas with direct correlation or adjacency to major pedestrian and or bicycle routes and buildings. The exploration of bicycle stations at transit areas is also encouraged.

Materials: Painted metal
 Color: Black, or clear-coated natural

RAILINGS, FENCES, GATES, AND OTHER FABRICATIONS

Railings, fences, gates and other fabrications shall match or be well integrated with the architectural design of that particular area or precinct. Railings, guardrails, and handrails conform to ADA accessibility standards.

Materials: Aluminum
 Color and Finish: Clear-coated natural

BOLLARDS

Bollards should be designed and constructed in a manner which coordinates and compliments the facility. These elements should not detract from the appearance of nearby buildings.

Materials: Consistent with the vocabulary of materials on the predominant facility. In many cases bluestone, limestone, granite, and precast concrete.

PLANTERS

Specification TBD



WALLS, WATER FEATURES, PONDS AND AMPHITHEATERS

All structures within the landscape are to be well integrated with the landscape design of each space and with the building materials of adjacent architecture. The materials used to construct retaining walls, abutments, veneered headwalls, and other vertical structures, including seating and the surrounds of water features and amphitheaters, though may not be directly associated with any particular building, will follow architectural guidelines where appropriate.

Materials: Bluestone and granite where contact with ground occurs, Indiana limestone and precast concrete elsewhere.

Pattern: Large monolithic stonework, irregular ashlar pattern predominant, details in regular ashlar patterns; capstones simple in form, horizontal tops.

Color: Natural or gray stone

Finish: For granite, lightly sandblasted and honed; natural cleft and sawn for bluestone; sawn and honed for limestone; light sandblast for precast concrete.

HARDSCAPES

A sense of place can be reinforced through the consideration of the public outdoor corridors or streets. The scale and density of an area can promote high usage and a positive pedestrian experience. The University recommends proportions on all corridors be approximately 1:1 and 1:2; ratios greater than 1:4 are not encouraged.

- Create patterns and linkage between outdoor rooms wherever possible. These links should be focused primarily on the pedestrian, transit paths, and required infrastructure.
- Consider use of continuous awnings, overhangs, or other devices to provide sun and rain protection where appropriate. These designs should utilize the proper sun orientations, and consider seasonal conditions.
- Generally, hardscape materials for plazas and sidewalks shall be medium-broom finished and poured in place concrete. Exceptions may be made in special areas, such as campus entrances, where a specific contrast or effect is desired. All materials and applications shall be ADA compliant.
- (See architectural guidelines)

BIKE PATHS

Materials: Concrete

Dimensions: Minimum 10'-0" in width; 5'-0" acceptable for street integrated lanes

Pattern: Score lines at a minimum 3'-0" on center; maximum 6'-0" on center, with equal spacing between score on any given segment

Color: Natural

PATHS AND SIDEWALKS

Materials: Concrete

Dimensions: Minimum width of all pedestrian ways is 6'-0"

Pattern: Score lines at a minimum 3'-0" on center, maximum 6'-0" on center, with equal spacing between scores at any given segment

Color: Natural

IX URBAN DESIGN GUIDELINES & STANDARDS

IMPLEMENTATION

LIGHTING CONSIDERATIONS

The lighting plan delineates the general areas where specific lighting is required. The dedication of the important evening pedestrian circulation routes as an illumination priority is a means of providing a campus-wide system of safe and secure pedestrian circulation. Such safe way paths will be controlled by automatic photo cells to provide light as soon as it's needed. Poles, luminaries, and fixtures around the major roads and pathways are of the same family, in differing heights, shapes, and sizes depending on their use and location. Most landscape lighting will be independently mounted; building-mounted lighting is described in the architectural guidelines, but generally follows the same motif. Emergency lighting is to be provided in accordance with applicable codes to light all means of egress. LED types are to be considered. In general, exterior lighting is to be metal halide or color corrected high pressure sodium. Exterior lighting branch circuits are to be provided with lighting contractors with hands-off-auto selector switches. Auto position is to be controlled by photocells. (MLA Cisat)

STREETS, CAMPUS, AND RESIDENTIAL DRIVES

Pole height is 30'-0" to 36'-0". Spacing and lamping to meet required city and county illumination standards. Sharp cut-off luminaries; color-corrected metal halide fixtures.

PARKING LOTS AND STRUCTURES

Reference Table 112.1 for lighting levels.

PEDESTRIAN PATHS, TRAILS, AND BIKE PATHS

Pole height for all paths & trails is 12'-0" to 14'-0"; visible color- corrected metal halide source; located and spaced to maintain security levels in all pedestrian areas, providing a minimum average of 1.5 foot-candles

BUS AND TRANSIT STOPS

Design and placement of lighting fixtures shall be well integrated in all campus bus and transit shelters. Lighting levels shall be 20 LUX or 2 FC.

BUILDINGS

Reference Table 112.1 for lighting levels; See Architectural Guidelines for fixtures.

FEATURE, ACCENT, AND SPECIAL LIGHTING

Use and approval is on an individual project-by-project basis. Typically low level, non-glaring light, not obstructive to the pedestrian or motorist, with non-breakable covers.

Passively-illuminated areas: not all areas of the landscape will be directly illuminated by light fixtures. A great deal of the campus will be passively-illuminated by the over wash of nearby fixtures. These open and or park-like areas are not expected to be significantly used during the evening or at night. Thus, like many public parks, they are best served by the rule that when the lights, if any, are out, or after dusk, then the use of the area is finished for the day.



Exterior Lighting Recommendations

Application	Lighting LUX	Levels FC
Roadways	5	0.5
Vehicular Area Entrances	50	5
Loading / Service Docks & Platforms	20	2
Parking	50	5
Building Entrances*	50	5
Building Emergency Exits / AOR	10	1
Building Surrounds	10	1
Walkways & Courtyards	16	1.5
Landscaping	5	0.5

Table 114.1: Lighting Recommendations

* Exterior entrances of buildings should maintain the same illumination level as the interior lobby / foyer space in order to avoid light reflection from the interior.

Reference James Madison University Comprehensive Safety Plan for further lighting and safety recommendations.

ENVIRONMENTAL GRAPHIC DESIGN GUIDELINES AND STANDARDS

Directional, informational, traffic, and building identification signage is an integral part of the campus. Clearly accessible, and comprehensible - in response to ADA requirements for the able bodied, physically impaired, and the blind - campus signage is nonetheless a subordinate feature for the students and faculty who use it most often. A wayfinding system based on that of the main campus provides direction and information. Traffic signage, of course follows VDOT, county, and city standards. Signs that identify buildings and places with special names are called out in individual letters or symbols in more prominent locations. Signage can play a key role in establishing the appearance of dignity and prominence, wholly consistent with the academic objectives of the University.

Primary or medium scaled signage is readable from a distance of 150 feet.

Secondary signage is smaller in size than primary signage, and should be illuminated and readable from approximately 50 feet.

- Keep the amount of signage to a minimum. Excessive signage and lack of continuity promotes confusion and poor aesthetics.
- Campus advisory signage is to be 12" x 18" with white Goudy Extra Bold font, mounted four feet high, in bronzetone color for the West campus and "CISAT" green for the East campus.

BANNERS AND SEASONAL DISPLAYS

Banner dimensions are 2'-0" x 4'-0" not to exceed 4'-0" x 8'-0", must be placed a minimum of 7'-0" above the ground.

WAYFINDING, SPECIALIZED, AND PEDESTRIAN ORIENTED SIGNAGE

Reorganize and eliminate cluttered and unnecessary signage. See pages 114 and 115 for proposed changes from 2017 signage study.

Develop a uniform exterior campus kiosk for the proper display of wayfinding information and other University postings. The design of these objects should be well coordinated with the other site furnishings, such as the benches, lamps, etc.

Wayfinding maps shall incorporate walking distance circles, and 'you are here' notations

All signage shall be ADA-compliant

Buildings: see Architectural Guidelines

Parking: see Transportation Guidelines

Roadways/Traffic: see Transportation Guidelines

NON-UNIVERSITY SIGNAGE

Circumstances may exist where standardized University signage is not appropriate. Mixed use, retail spaces, and other approved venues on campus property should be encouraged to use creative signage. These signs should be integrated into the context of the area, with the architecture, attention to scale and placement as required. Approval is on a project-by-project basis.

EMERGENCY ASSISTANCE STATIONS

Providing emergency assistance stations should be continued. Stations should be located near all transit stops and pedestrian entrance areas and should also include video surveillance.

Spacing of these stations should be within 100 feet of a site entry and no more than every 500 feet apart along a given pedestrian path.



IX URBAN DESIGN GUIDELINES & STANDARDS

IMPLEMENTATION

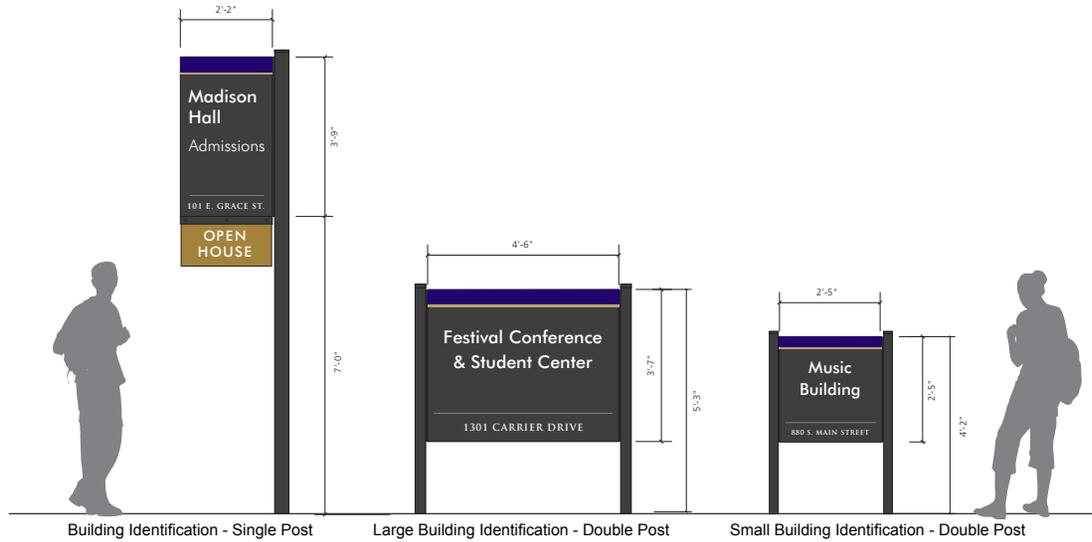


Figure 60: Recommended Campus Signage Guidelines

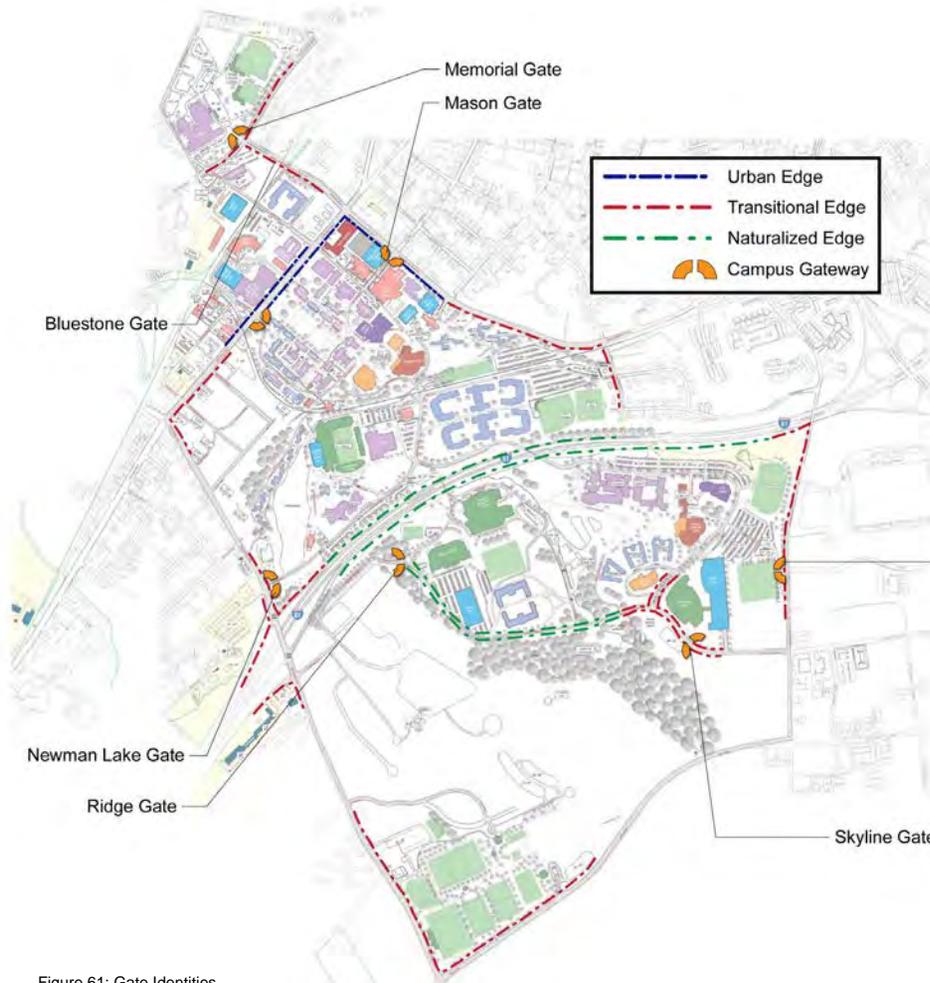
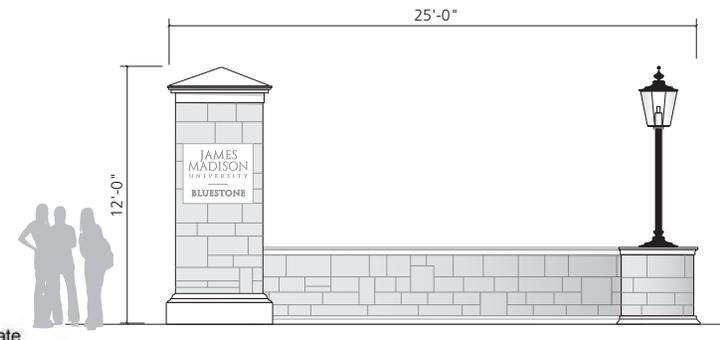
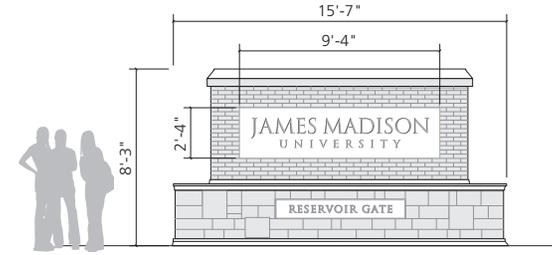


Figure 61: Gate Identities



IX TRANSPORTATION DESIGN GUIDELINES

IMPLEMENTATION

TRANSIT STOPS & SHELTERS

- Must maintain full compliance with ADA regulations.
- All structures should provide adequate protection from the sun, wind, and rain.
- Additional shading mechanisms or devices are recommended for seasonal conditions.
- Seating and trash receptacles must be integrated.
- Lighting should also be integrated and powered via photo-voltaics.
- University regulated wayfinding system must be integrated.
- The design should take advantage of signage and advertising opportunities.
- A minimum distance of 2 ft should be maintained between the back-face of the curb and the roof or panels of the shelter. Greater distances are preferred to separate waiting passengers from nearby vehicular traffic.
- Appropriate downspouts, gutters, and positive drainage shall be integrated into design where appropriate.
- Methods and materials of construction are to be limited to non corrosive materials, able to withstand ultraviolet, local, and natural pollutants as well as cleaning chemicals.

PEDESTRIAN CIRCULATION

Walks, Paths, and Trails

- The pedestrian and bike path network has been designed to provide continuous, safe, and visually interesting connections for pedestrians throughout the campus. Circulation between various points both on and off-campus are enhanced by planting, lighting, and relationships to open spaces. Configuration, design, and attention to ADA accessibility standards are an integral element of the pedestrian circulation system.

Examples of countermeasures in accordance with VDOT include:

- Access Management – consolidate entrances, close cross-overs
- Reconfigure/reconstruct intersections – install roundabouts, realign approaches, optimize signal systems
- Bicycle and pedestrian accommodations
- Install shoulders or medians
- Signage and pavement markings
- Improve sight distance
- ITS solutions (Intelligent Transportation Society of America)
- Turn Lanes – construction or extension
- Roadway lighting

Other topics for consideration:

- Dimensions of new and renovated corridors and the right-of-way
- Drop-offs, transit stops and shelters
- Bicycle storage/stands
- Coordination of pedestrian, landscape, and environmental graphics
- Bicycle lane widths, locations, placement in road sections
- Transit lane widths, locations, placements in road sections
- Use of underground utilities to minimize conflicts with pedestrians, cyclists, and motorists
- Use of bioswales and other best use practices for stormwater management



CARRIER DRIVE REALIGNMENT

Carrier Drive provides the primary vehicular access between the East Campus and Bluestone/Village Areas. These areas are divided by I-81 which Carrier Drive crosses and connects the areas on both sides. Carrier Drive is used by all modes of travel, including automobiles, buses, bicycles, and pedestrians. In the East Campus, Carrier Drive is adjacent to the academic buildings with parking between Carrier Drive and I-81. This results in pedestrians having to cross Carrier Drive to move between the parking lots and the campus buildings, resulting in potential conflicts between vehicles and pedestrian. Currently there are six (6) pedestrian crosswalks along Carrier Drive; two of these crosswalks have stop signs for the vehicular traffic. In all cases, the pedestrians have the rights of way at the crosswalks.

An alternative to the current alignment of Carrier Drive is to relocate Carrier Drive to the outside of the parking facilities and move the parking closer to the buildings. This would eliminate the conflicts between the pedestrians and the vehicles using Carrier Drive. This alternative realignment for Carrier Drive and relocation of the parking is not recommended in this master plan, but could be considered during future traffic studies of the pedestrian and traffic flow in this area of campus.

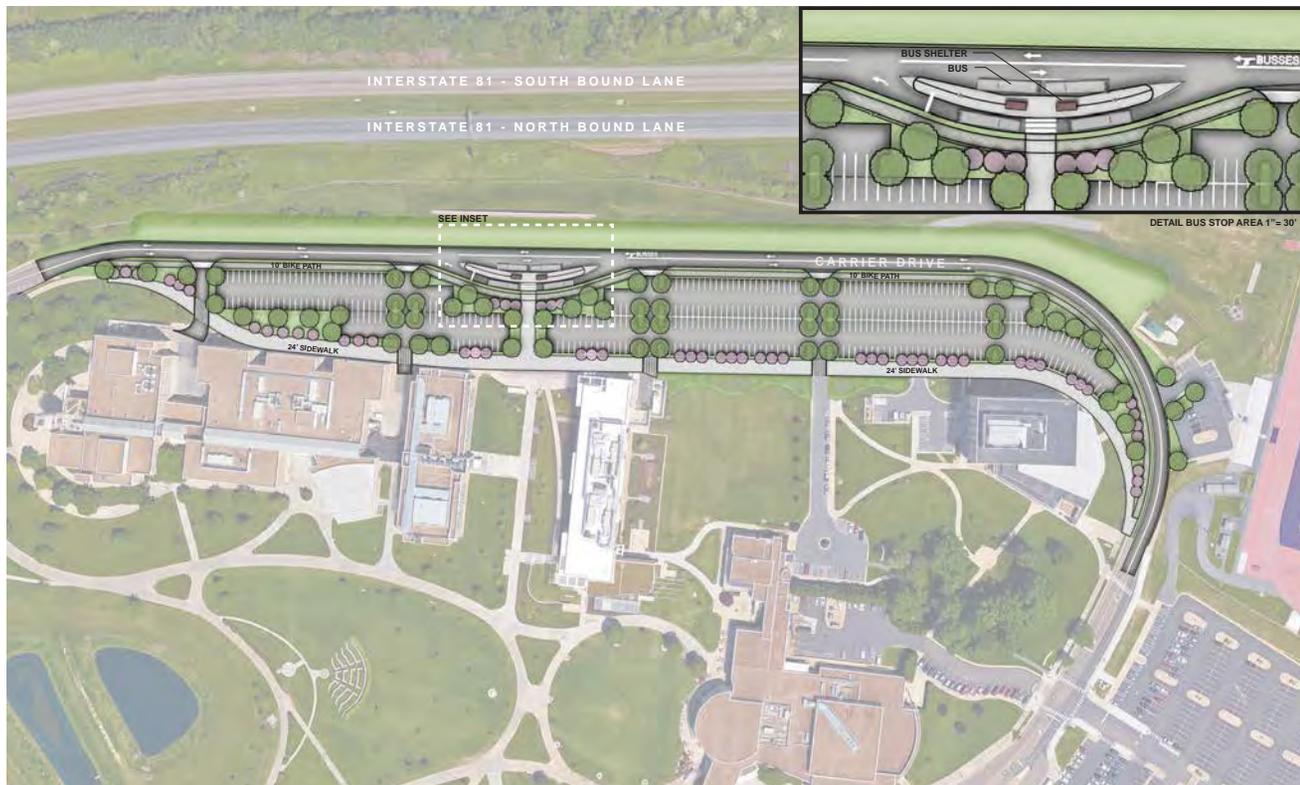


Figure 62: Carrier Drive Relocation Conceptual Plan

IX SUSTAINABLE DESIGN GUIDELINES

IMPLEMENTATION

In 2009, the General Assembly of Virginia passed the High Performance Buildings Act.

This act states that any executive branch agency or institution entering the design phase for the construction of a new building greater than 5,000 GSF, or the renovation of a building where the cost of the renovation exceeds 50% of the value of the building, shall conform to the Virginia Energy Conservation and Environmental Standards (VEES), which cited the U.S. Green Building Council program LEED (Leadership in Energy and Environmental Design), or the Green Building Initiative "Green Globes", as benchmarks.

In 2016, VEES was updated to reference the 2012 International Green Construction Code as an additional path to compliance with the High Performance Building Act of 2009.



SITING AND GENERAL

- Siting and placement of facilities should respond well to adjacent structures and open campus green areas. New and renovated campus buildings will incorporate contextual-based design, recognizing the equal importance of the interstitial relationships of exterior and interior spaces and the buildings themselves. Consideration and response to climatic elements of each site, including but not limited to sun, prevailing winds, light, and topography is required.
- Implementation of strategies that maintain and create desirable sight lines to and from the facility and campus grounds.
- Location of exterior service docks and refuse pick-up points out of view, screened and located, where practical, away from pedestrian areas.
- Creation of building mass which avoids monumental proportions that encroach on pedestrian circulation areas. Careful attention and consideration to massing as to positively contribute to the pedestrian-oriented concepts.
- Creating building entries and sequences that are inviting and provide transparency into the buildings.

SETBACKS AND BUILDING CONTROL

- A standardized setback for the entire campus may not be applicable in all instances. Each district and or building should be examined to access the appropriate level of blast mitigation, forced entry, building hardening techniques, easements, and security and emergency access. It is the recommendation of this master plan to consider alternate means in achieving the desired level of security and access control for existing facilities.
- Major building entrances should be equipped with access control devices for 24-hour building use or after-hours control, depending on the function of the building. Some facilities will require enhanced systems depending on their use and location. Secondary entrances and emergency exits should be equipped with monitoring devices.

- Mechanical, electrical, transportation, and other equipment items that are located along the exterior of a facility should be integrated into the design wherever possible. These elements include air intake/exhaust vents, exterior lights, utility connections, plumbing vents, fuel tank vents, liquid oxygen tanks, transformers, trash compactors, containers, and loading docks. Screen walls and service area enclosure materials, colors, and finishes shall be consistent with the exterior elevations of the buildings which they serve.

BUILDING ELEMENTS

Roofing, Penthouses, and Parapets

- Roof forms, colors, materials, and textures should be compatible with the treatment of the building’s exterior walls. Roofing planes can exhibit offsets and changes in direction to establish scale and diversity of form, identifying entry points and orientations from a distance. Dormers, reverse dormers, eyebrow windows, and other similar or more creative roof elements are desirable. All rooftop mechanical and electrical equipment should be screened to avoid an unsightly appearance from the street or ground level.
 - Flat roofs with parapets may be used where other means of unifying building masses are not desirable and or practical. Parapets should be consistent in material and texture to the building’s exterior walls.
 - Appropriate roofing material selections include: Dimensional fiberglass shingles, standing seam metal, tiles (slate, cementitious, etc.).



Fenestration and Other Facade Elements

- Walls
- Windows
- Doors
- Glazing is one of the primary means of maintaining an exchange between the interior and exterior. New construction is recommended to integrate approximately 50 to 75% transparency at grade levels and 30 to 50% on upper levels where feasible, and in accordance with LEED principles. Glass on entry and frontage areas should not be heavily tinted or highly reflective.

Awnings, Canopies, and Other Shading Devices

- Materials: Quality, durable materials should be utilized in areas and or surfaces where there is a tactile relationship between the building and users. The use of styrofoam patterning, moulding or other ornamentation is highly discouraged. Use of low maintenance/vandal-resistant interior and exterior finishes and building systems that are commonly available for necessary replacement are recommended.

Specific Massing, Height Standards, and Ratios

- As the availability of expansion area continues to become more valuable, a redefining of maximum building heights must be addressed. The need for “verticality” among the existing campus core offers focal opportunities, along with the conservation of land area. Where appropriate as “signature” buildings, greater building heights shall be considered. Campus “icons”, or vertical focal elements, are strongly encouraged, in order to redefine the horizon line of the campus and help make the University more visible, and a more prominent focal point, within the community.

Color Specifications

- Recommendations for the color and texture of new, renovated, or expanded facilities should be established to compliment and provide continuity for new and existing facilities. In addition to providing aesthetic harmony in the campus appearance, this approach allows more cost-efficient maintenance of all University facilities.

IX ARCHITECTURAL DESIGN GUIDELINES

Building Signage

- Exterior Requirements:
 - Building signs are to be 28" wide by 30.5" mounted three feet high (top to sign). JMU is currently implementing the first phase of the new campus-wide signage and wayfinding project. Refer to figure on figure 60 on page 116.

Interior Lighting

- Requirements:
 - Interior lighting system designs should be based on minimum illumination levels recommended by the Illuminating Engineering Society (IES) standards.
 - Design for lighting in classrooms, lecture halls, laboratories, and offices are to provide a minimum Visual Comfort Probability (VCP) of 70.
 - In general, lighting fixtures for interior lighting are to be LED or high-efficiency fluorescent with standard F40 lamps and energy saving ballasts.
 - The use of incandescent lighting is to be limited to special requirements and conditions. The use of recessed incandescent lighting is to be minimized.
 - Emergency lighting and exit signs are to be provided in accordance with applicable codes to light all required means of egress. LED-type exit signs are to be considered.
 - Occupancy sensors are to be provided for automatic control of lighting in single offices, classrooms, toilet rooms, and meeting rooms.
 - Generally stated, exterior lighting is to be metal halide or color-corrected high pressure sodium.
 - Exterior lighting branch circuits are to be provided with lighting contractors with hands-off-auto selector switches. Auto position is to be controlled by a photocell.





INTERIOR SIGNAGE

- Requirements:
 - Standard departmental signage size is 10" x 10".
 - Standard room signage size is 4" x 10", posted on the wall adjacent to the opening side.
 - Room signage must provide the room # and the room function (closet, classroom, etc.).
 - Signage color options are as stocked by Facilities Management.
 - Exit, means of egress, and evacuation route signage must comply with Life Safety Code requirements.
 - Evacuation route signage is required for all places of assembly (auditoriums, theatres, etc.).
 - Signage for places of assembly will also include maximum occupancy ratings.

BUILDING SYSTEMS

- Existing guidelines to be updated:
 - Structural
 - Mechanical
 - Electrical
 - Plumbing
- Methods of Construction
 - Existing guidelines to be updated
- Life Cycle Costs

HISTORICAL GUIDELINES

Several buildings on campus meet the criteria for listing in the National Register of Historic Places. While this master plan will not fund or implement these documents, it is recognized that a programmatic Agreement and Historical Management Plan be pursued in the near future. The Secretary of the Interior's Standards for Rehabilitation provide a basic set of principles to guide work on historic buildings and areas of campus.

THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION

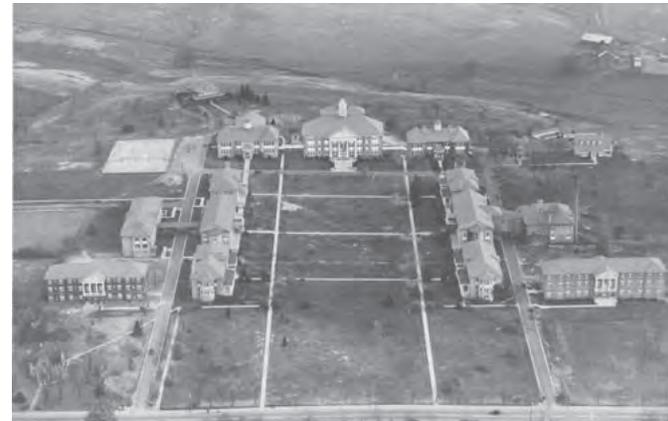
1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, construction techniques, or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historical features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

(Source: https://www.nps.gov/tps/standards/four-treatments/standguide/rehab/rehab_standards.htm)

It is recommended that the University also establish specific guidelines and standards in the areas of:

- Accessibility Improvements
- Care and Maintenance
- Mechanical, Electrical, and Plumbing Improvements
- Appropriate Facility Use and Occupancy



The purpose of these guidelines is to frame a description of the campus landscape and to establish general criteria to be used in directing future site design efforts. The guidelines are not meant to be, with certain exceptions, a set of prescriptions that narrowly define the exact character and development of the landscape. Rather, they are laid out with the expectation that as the development of the campus proceeds, the design intentions of the master plan will ensure that individual projects, developed over time, will manifest a consistency in materials, form, and orientation, and will collectively result in a coherent campus environment of high quality.

PLANTING BASED ON CPTED GUIDELINES

Landscape planting design should be guided by CPTED (Crime Prevention Through Environmental Design) guidelines. Plant material selection and arrangement should aim to enhance a sense of security by allowing for greater visibility within the surroundings and avoiding concealment in or around building entrances, pedestrian walkways, or parking lot perimeters due to screening height vegetation. Planting design should be coordinated with security camera placement and site lighting design. A clear area around each building of at least five feet (low groundcover) is advised to discourage hidden access, and to facilitate surveillance by the security department around the building edge, as well as surveillance from the building outward.

Landscape design may be used to enhance the clarity of wayfinding and circulation patterns, thereby contributing to greater safety by defining traffic patterns and security zones, and potentially decreasing traffic speed. In areas of potential vehicular/pedestrian interaction, planting should be designed to allow clear visual connection between pedestrians and drivers, and be reinforced with substantial deterrents against vehicular access into pedestrian areas.



TREE PRESERVATION AND LONG-TERM MANAGEMENT

Potential impact of new development on existing campus trees should be a consideration in determining program site locations, building design and associated landscape improvements.

Existing trees identified for preservation on the campus must be adequately protected from damage during construction as follows:

The University should review contractor's plans for tree preservation area procedures. No site preparation or construction work should begin on any site until tree preservation areas have been designated and appropriately marked.

Site design should aim to minimize/avoid grading within the limits of the tree canopy. Those trees selected for preservation must be flagged and protected with appropriate tree protection fencing. Fencing should be set at the limits of grading, ideally extending beyond the full spread of the tree's branches to increase probability of successful preservation. Fencing is removed upon completion of construction. Clearing of underbrush under the trees' drip line should not occur until completion of construction activities. Stockpiling, parking, storage or dumping of materials and any other use must be prohibited within preservation areas. A certified arborist should be consulted whenever construction will come within the drip line of a tree to be preserved. In general, no soil is to be disturbed or manipulated within the tree preservation areas. No grade changes that allow drainage to collect in protected areas should occur. If a tree designated for preservation is damaged, a certified arborist is to be consulted and appropriate measures taken to prevent loss of specimen trees and/or work with the University to determine required replacement or compensation if trees designated for preservation are damaged and cannot be saved.

Preservation and enhancement of tree stock will ensure continued benefits of shading, stormwater management, erosion control, and water quality. The campus stock of large native trees, plantings, and areas of natural vegetation shall be maintained. Enhancement of existing vegetative screens and buffers shall be implemented. As surface parking and other areas of impervious materials are removed, an organized effort to re-naturalize these spaces with native planting materials is recommended.

IX LANDSCAPING DESIGN GUIDELINES

IMPLEMENTATION

PLANT MATERIAL SPECIES, PLACEMENT, AND PATTERNING

Broad Planting Principles:

The establishment of a coherent open space system of outdoor rooms and links depends heavily on the implementation of a campus wide planting program involving the planting of new trees and the care and maintenance of existing trees. Planting should be both functional and aesthetically pleasing. Campus plants shape one's perception of the campus and contribute to the unity, sequence, scale and character of the campus landscape. Mature trees bring a sense of history, permanence and strength to the campus image.

- Campus plantings should be appropriate to the scale and setting of a university environment. Plantings should be composed as large masses and organized geometric patterns, such as tree lines, rather than as fussy collections.
 - The compositional location of new plantings should work in combination with existing plant materials to establish an ordering of outdoor spaces that are clearly defined and perceived as a unified whole. Plantings should reinforce the physical structure of the master plan and help to delineate streets, walks, and open spaces. Plants should function to define space rather than merely add decoration.
 - The plant palette should be appropriate to the climatic conditions of the Shenandoah Valley, Mountain region and specific conditions of the site, including soils, microclimate and stress of human impact. The palette should be primarily composed of native materials. When using non-natives, these plants should be visually compatible with local indigenous flora. Exotic and high maintenance selections are discouraged.
 - Programmed tree planting should encourage an ecological balance between various species to reduce the likelihood of collective loss of a single species or group of species that may occur due to an existing or potential yet unknown blight condition. Planting programs should aim to develop age diversity in the tree stock through a phased introduction of trees within given areas overtime to improve the long-term sustainability of the aesthetic landscape and vegetative communities.
- Selection should favor long-lived native materials with reduced maintenance requirements. Plants should be selected based on consideration of their mature size and appropriateness for the setting. Materials should be selected to allow growth in their natural form, avoiding the need for regular pruning maintenance.
 - Species selection should also incorporate preferences for shading, cooling, the attraction of birds, butterflies, and other wildlife. The specifics of the plant list, and the manner in which the plants are laid out, differentiates each area from another.
 - As shade trees within the open landscape mature, branches should be limbed up to a minimum of 6 feet above grade to provide a clear view underneath the foliage. To promote safe passage of pedestrians, bicyclists, and vehicles and protection of the trees, trees adjacent to walkways or other pedestrian areas should be limbed up to seven feet above grade, where adjacent to bikeways limbed up to 10 feet, and where adjacent to service or roadways with truck circulation limbed up to 12 feet minimum.
 - Trees and other tall plants should be spaced sufficiently to allow both natural light and artificial light to penetrate the foliage, achieving the recommended lighting levels.
 - Shrubs and groundcover should be limited to a maximum of 18 inches in height immediately adjacent to building entrances, pedestrian walkways, or parking lot perimeters. Shrubs used for screening parking should be offset minimum of two feet from the curb and be maintained at four-foot maximum height.
 - Except as otherwise specified, size and grade of plant materials shall conform to American Standard for Nursery Stock (ANSI Z60) standards.



CAMPUS LANDSCAPE THEME AREAS

For each of the campus landscape theme areas, a palette of plant materials is appropriate to promote continuity and create the necessary landscaping effects.

Meadow (Central Quadrangle), Glade, and Grove

The meadow landscapes are graduated from formal to less formal, depending on the topography and exact location. Generally, these areas can be classified as focal open spaces within the campus boundaries. Variations can range from formal plantings and maintained mowed lawns to fields of native grasses and wild flowers.

Meadow (Central Quadrangle), Informal/Perimeter Settings

Placement and patterning of these materials shall be well incorporated into existing designs.

Grove Grid

Grove landscapes are associated with campus buildings and campus streets. These planting areas are characterized by high canopies of hardwood trees that unfold, and unveil views outward from, and into, building complexes. The concept of the Grove speaks to an historic campus landscape tradition of treed open spaces. The layout of a Grove landscape is driven by building grids and distances. Around the academic area the grid spacing for tree planting is approximately 50'-0", with a minimum planting distance of 12'-0" away from buildings.

Campus and Residential Drives

Street trees are to be planted at a maximum of 50'-0" on center, with trees being equally spaced along streets and in parking areas.

Glades

Glade landscapes are fine-grained, open spaces near building entrances, and outdoor spaces through which people pass on a daily basis. Paved areas and terraces are variations of Glade landscapes. These areas are outfitted with landscape furnishings, e.g., benches, signs, kiosks, waste containers, etc. They are characterized as smaller in scale than either the Meadow or Grove areas, and are planted with understory trees, shrubbery, groundcover, perennials, etc. The scale and texture of plantings in the Glade areas contrast with the broad, expansive scale of the open space and plantings in other areas. Areas should be carefully planted and maintained to control overgrowth to avoid security hazards.

Display/Accent Beds

The master plan does not illustrate display planting beds, but, they are a part of the vernacular of the campus. The seasonal display of colorful beds composed of perennial and/or annual flowers, ornamental grasses and groundcovers - provided on an almost year-round basis - is a positive feature of the campus landscape. However, their maintenance is labor-intensive. It is recommended that bedding plant displays be restricted to massings at key campus areas and be well maintained. Displays are most successful when the materials are limited in variety, and are not in competition with other materials such as shrubbery, and the quantity of plants is substantial enough to have a strong visual impact within the specific setting. Beds are primarily laid out near building entrances and at key locations such as gateways and monuments, where they offer the most immediate visual impact.

ARBORETUM

The Arboretum Expansion may be characterized as predominantly forested. These areas extend the habitat of the wooded tract of the existing University Arboretum south of University Boulevard. Arboretum plant materials most closely reflect the natural selection of Shenandoah Valley woodlands. Though these areas of planting are maintained and carefully managed by the University, plantings will be encouraged to naturalize to create a dense, verdant setting.

The western perimeter of the campus is laid out as an extension of the University Arboretum, which is contiguous with the southwest corner of the campus boundary, across University Boulevard. This extension will function not only to screen the Resource Recovery Facility from view, but also to use native plant materials to recover and restore the original woodlands of the area. As the planting of this area is of early consideration in the development of the West Campus, a detailed description of its planting follows.



Arboretum / Screening Materials

The following screen planting formulas are for the area between the Resource Recovery Facility and the West Campus. This area is limited to the open meadow and fallow lands on the western campus site. There are small areas of hedgerow and woodlot in the vicinity; addressed separately.

The native vegetation of the area is an oak-hickory association, and is characteristic of the arboretum. The Master Plan establishes the concepts of native, naturalized perimeter plantings, and of extending the Arboretum experience into these same areas, especially on the west side. While not all native plant materials grow quickly enough to be considered for screening purposes, many natives are appropriate fast growers and are typical of a climax forest or forest edge ecotone. A blend of plants will ultimately achieve the desired results, if planted together. This blend ensures that, along with the faster-growing screen trees, the relatively slower-growing climax trees will provide good shade, will be in the ground much longer, and that other of the plantings will immediately address Arboretum objectives.

A 50/50 mix of the faster-growing tree species around the edges with in-fill of climax forest natives is proposed. Edge planting of native understory trees and shrubs, in order to establish natural 'ecotone' relationships and to fill-in and screen the lower view lines to the Resource Recovery Facility under the tree canopies as the larger trees mature.

A planting separation of 30'-0" is maintained between large screen planting and climax forest trees for a dense, woodland effect. Separation of 40'-0" between smaller understory trees is intentionally specified for a more sparse effect beneath the tree canopy.

Planting Recommendations

Early spring planting, minimum 6'-0" high material for trees, 4'-0" understory trees, shrubs, understory groundcover in flats, and 18" planting separation for ground cover and pint-sized material is recommended.

Plant Materials (Campus Wide)

The following tables are representative of the appropriate landscape materials. They are primarily native, however, this is not a proscription. Trees are to be planted at a minimum height of 10'-0" - 12'-0", balled and burlapped.

IX LANDSCAPING DESIGN GUIDELINES

IMPLEMENTATION

POTENTIAL PLANT PALETTE		
ITEM	BOTANICAL NAME	COMMON NAME
TREES		
	<i>Amelanchier canadensis</i>	Serviceberry
	<i>Betula nigra</i>	River Birch
	<i>Carpinus caroliniana</i>	Musclewood
	<i>Ilex opaca</i>	American Holly
	<i>Nyssa sylvatica</i>	Black Tupelo
	<i>Quercus bicolor</i>	Swamp White Oak
	<i>Quercus palustris</i>	Pin Oak
	<i>Thuja occidentalis</i>	American Arborvitae
SHRUBS		
	<i>Andromeda polifolia</i>	Bog Rosemary
	<i>Aronia arbutifolia</i>	Red Chokeberry
	<i>Clethra alnifolia</i>	Summersweet
	<i>Cornus amomum</i>	Silky Dogwood
	<i>Dirca palustris</i>	Eastern Leatherwood
	<i>Fothergilla gardenii</i>	Dwarf Witch Alder
	<i>Hypericum 'Hidcote'</i>	Shrubby St. Johnswort
	<i>Ilex glabra</i>	Inkberry
	<i>Ilex verticillata</i>	Winterberry
	<i>Itea virginica</i>	Virginia Sweetspire
	<i>Kalmia angustifolia</i>	Sheep Laurel
	<i>Kalmia latifolia</i>	Mt. Laurel
	<i>Lindera benzoin</i>	Spicebush
	<i>Rhododendron viscosum</i>	Swamp Azalea
	<i>Rosa palustris</i>	Swamp Rose
	<i>Rosa virginiana</i>	Virginia Rose
	<i>Vaccinium corymbosum</i>	Highbush Blueberry
	<i>Viburnum cassinoides</i>	Witherod Viburnum
	<i>Viburnum dentatum</i>	Arrowwood
	<i>Viburnum lentago</i>	Nennyberry
VINES		
	<i>Apios americana</i>	Groundnut
	<i>Parthenocissus quinquefolia</i>	Virginia Creeper

POTENTIAL PLANT PALETTE		
ITEM	BOTANICAL NAME	COMMON NAME
TREES		
GROUND PLANE		
	<i>Acorus calamus</i>	Sweetflag
	<i>Aster puniceus</i>	Swamp Aster
	<i>Glyceria canadensis</i>	Manna Grass
	<i>Hedera helix</i>	English Ivy
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Scirpus cyperinus</i>	Woolgrass
FERNS		
	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Dennstaedtia punctiloba</i>	Hay-scented Fern
	<i>Matteuccia struthiopteris</i>	Ostrich Fern
	<i>Osmunda claytoniana</i>	Interrupted Fern
	<i>Osmunda regalis</i>	Royal Fern
	<i>Thelypteris palustris</i>	Marsh Fern
PERENNIAL PLANTS		
	<i>Achillea millefolium</i>	Yarrow
	<i>Andropogon gerardii</i>	Big Bluestem
	<i>Aster novae-angliae</i>	New England Aster
	<i>Chasmanthium latifolium</i>	Nothern Sea Oats
	<i>Echinacea purpurea</i>	Purple Coneflower
	<i>Hemerocallis 'Happy Returns'</i>	Happy Returns Daylily
	<i>Panicum virgatum</i>	Switchgrass
	<i>Schizachyrium scoparium</i>	Little Bluestem
NATIVE GRASS SEED MIX - SLOPES		
	<i>Agrostis alba</i>	Redtop
	<i>Agrostis stolonifera</i>	Creeping Bentgrass
	<i>Aster novae-angliae</i>	New England Aster
	<i>Bidens curnua</i>	Nodding Bur Marigold
	<i>Elymus virginicus</i>	Virginia Wild Rye
	<i>Festuca rubra</i>	Creeping Red Fescue
	<i>Lolium multiflorum</i>	Annual Ryegrass
	<i>Verbena hastata</i>	Blue Vervain

Table 128.1: Potential Plant Palette

MAINTENANCE STANDARDS

The purpose of the Maintenance Standards is to promote a uniform, neat, and clean appearance throughout the University, and to maintain the quality of cleanliness and good order already established. During the course of construction on any site, the Construction Guidelines are to be strictly adhered to.

Maintenance responsibilities include, but are not limited to: lawn mowing and landscape maintenance, replacement of dead plant material, clean-up of trash and litter, cleaning and repair of all paved surfaces, snow removal, repair, painting, and routine maintenance of all buildings, systems and signs, and the repair/replacement of light fixtures and light bulbs.

Parking areas, driveways, and roadways must be kept in good repair. Parking lot striping and other pavement graphics are to be repainted as required.

Drainways shall be kept clean and free of obstructions, and appropriate action shall be taken to prevent or repair erosion.

Maintenance equipment is to be stored so that it is not visible from roadways, pedestrian pathways, open spaces, or adjacent lots.

CONSTRUCTION STANDARDS

The intention of the construction standards is to minimize the adverse impacts of construction related activities, and to ensure full conformance with erosion and sediment control requirements, in order to minimize soil erosion by water and wind.

All construction storage and equipment yards shall be fenced in an approved manner and shall be located to minimize impact on adjacent properties and public streets.

Construction materials are to be stored on site, and in an orderly manner that will not interfere with other activities. No construction equipment shall be parked in the street. Mud, dirt, or other surface debris deposited on the public or common roadway at the access point will be washed away in order to avoid compaction and damage to the road, and to minimize impact on drainage systems. Concrete truck wash-outs are allowed only in designated areas. Construction sites shall be maintained in a neat, orderly manner. All trash shall be kept in enclosed containers and emptied frequently.

Temporary structures, portable offices, and other related facilities will be maintained in good repair and arranged in a compact manner on the construction site. These facilities will be situated so as to not be obtrusive or unsightly when seen from the road or adjacent parts of the campus. The location and physical character of temporary structures, such as construction trailers or portable buildings, are subject to review. These structures, as well as parking spaces, for workers must be located within the construction site and not on adjacent streets and easements. All temporary structures and portable facilities will be removed soon after issuance of occupancy permit unless construction on another phase of the same project is to commence.

At the end of construction of each phase, reproducible copies of record drawings (as-builts) showing the actual locations of all buildings, landscape features, underground utilities, and systems are to be prepared and updated, ensuring a reasonable check of the progress of all elements of the implementation of the master plan.



IX SUSTAINABILITY

IMPLEMENTATION

OFFICE OF ENVIRONMENTAL STEWARDSHIP AND SUSTAINABILITY

The Office of Environmental Stewardship and Sustainability (OESS) is a department in the Division of Access and Enrollment Management at James Madison University. The mission of the OESS is to facilitate sustainability by advocating for environmental stewardship priorities, coordinating reporting and recognition of the sustainability-related efforts of the JMU community, and encouraging engagement of all members of the JMU community in sustainability education and environmental stewardship.

The responsibility for sustainability (including environmental stewardship) is not housed in one University unit, but is shared across all divisions. JMU's achievements can be attributed to the efforts of staff, faculty and students in many areas, commonly in collaboration. Visit www.jmu.edu/sustainability for more information about sustainability at JMU.



RESPONSIBILITIES

- Coordinates tracking and reporting related to environmental stewardship and sustainability.
- Measures environmental stewardship and sustainability progress.
- Represents JMU's environmental stewardship and sustainability efforts externally.
- Facilitates strategic planning related to environmental stewardship.
- Promotes the campus environmental stewardship learning outcomes.
- Promotes environmental stewardship and sustainability education and engagement.
- Obtains resources and builds internal and external partnerships that enhance environmental stewardship capacity.
- Assists with project funding searches and applications related to environmental stewardship and sustainability.
- Facilitates access to campus information and resources related to environmental stewardship.
- Coordinates the East Campus Hillside and Sphere Theater.
- Coordinates the Institute for Stewardship of the Natural World (ISNW), the University stakeholder committees.
- Provides support for conference presentations by students and for undergraduate summer research experiences related to environmental stewardship.

The OESS organizes four stakeholder committees, which are collectively called the Institute for Stewardship of the Natural World (ISNW) Committees. Faculty, staff, students, and local government staff representatives serve on the committees. The committees make policy and practice recommendations, conduct projects related to their expertise, and serve as peer educators.

The Awareness and Programming Committee increases awareness of issues of sustainability and environmental stewardship through planning, marketing, and supporting programs that share information, which challenges all members of the JMU community to think critically about their role in achieving the long-term stewardship of the Earth.

The Campus Accessibility Committee supports the transportation demand coordination efforts on campus by assisting with analyzing progress and identifying transportation opportunities.

The Conservation Committee models and champions best practices for environmental stewardship and pilot tests potential environmental stewardship initiatives.

The Education and Scholarship Committee promotes and celebrates teaching and learning across disciplines and general education, as well as scholarly and creative activities that engage faculty, staff, students, and other members of the community in improving our environment.

The OESS is advised by an Executive Council, and council members chair the ISNW committees.

Source: <https://www.jmu.edu/stewardship/stewardship-overview.shtml>

SUSTAINABILITY

The responsibility for sustainability (including environmental stewardship) is not housed in one University unit, but is shared across all divisions. JMU's achievements can be attributed to the efforts of staff, faculty, and students in many areas, commonly in collaboration.

The Association for the Advancement of Sustainability in Higher Education (AASHE) "defines sustainability in an inclusive way, encompassing human and ecological health, social justice, secure livelihoods, and a better world for all generations." Highlights of JMU's efforts in these areas are included in the University's reporting to AASHE's Sustainability Tracking, Assessment and Rating System (STARS). Information on JMU's programs and plans related to the social and economic dimensions of sustainability can be found on numerous JMU websites, such as the Office of Access and Inclusion and Institute for Innovation in Health and Human Services (IIHHS) Community Engagement.

ENVIRONMENTAL STEWARDSHIP

The University has a long-standing history of environmental stewardship efforts. The Office of Environmental Stewardship and Sustainability (OESS) supports, coordinates, and promotes environmental stewardship efforts across divisions of the University, and conducts reporting on environmental stewardship and sustainability. Among areas of effort supported by the OESS are:

- Facilities Management
- Transportation
- Academics
- Research and Scholarship
- University Recreation
- Student Organizations



For more information, visit:
<http://www.jmu.edu/sustainability/index.shtml>



ENVIRONMENTAL STEWARDSHIP ACTION PLAN

President James Madison has been referred to as the “forgotten father of American environmentalism” by author Andrea Wulf. JMU, as an institution, has a history of environmental stewardship contributions in education, research, service, and operations. In 2010, the JMU Environmental Stewardship Action Plan (ESAP) 2011-2015 communicated a University-wide strategic commitment and initiated more systematic tracking, coordination, and recognition of the many environmental stewardship activities occurring. The ESAP Progress Report 2011-2015 highlights campus contributions.

The guiding principles for the campus’ second ESAP are to conserve, steward, and restore natural systems, and to advance environmental stewardship through education, scholarship, and engagement. For the purposes of the plan, JMU defines environmental stewardship as: “the comprehensive understanding and effective management of critical environmental risks and opportunities related to climate change, emissions, waste management, resource consumption, water conservation, biodiversity protection, and ecosystem services” (United Nations Global Compact and Duke University, 2010). The following are the Environmental Stewardship Action Plan Goals for 2016-2020:

1. JMU will make environmental stewardship and sustainability learning opportunities accessible to students.
2. JMU will encourage environmental stewardship professional development for staff.
3. JMU will provide environmental stewardship professional development for faculty.
4. JMU will incentivize sharing knowledge-, practice-, and learning-related accomplishments in the areas of environmental stewardship and sustainability.
5. JMU will expand local community access to physical and intellectual environmental stewardship educational services.
6. JMU will provide resources for students, faculty, and staff to practice environmental stewardship through waste reduction, sustainable transportation (alternatives to single occupancy vehicle use), and energy conservation.
7. JMU's grounds, building, transportation, and purchasing practices will prioritize human and environmental health.

Source: http://www.jmu.edu/sustainability/action_plan.shtml

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LIST OF REPORTS

- Other planning documents were used in the compilation of this Master Plan. Complete versions of these documents can be accessed through the James Madison University Facilities Management office.
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 2. Moseley Architects. JMU Student Survey 2016. Richmond, VA : 2017
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 7. Virginia Department of Conservation and Recreation. Native Plants for Conservation, Restoration, and Landscaping. Richmond, VA : 2011.

APPENDIX

APPENDIX

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Campus Master Plan Update 2017

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