George Mason University Master Plan Phase Two Report

December 2021



Master Plan Phase Two Report

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EXECUTIVE SUMMARY

The George Mason University master plan is a framework to guide ongoing decision making around the physical environment and capital investment. The plan's primary focus is on the Arlington, Fairfax, and SciTech campuses, but its general principles can apply to all Mason facilities. It was created collaboratively by the Mason community, with about 5,000 people participating in an online interactive mapping survey, about 2,000 people participating in eight town halls, and over 100 stakeholder meetings with both internal and external constituencies.

Phase One of the master plan ran from January 2020 through December 2020 and focused on data gathering and analysis leading to the development of programmatic identities for the three primary campuses. Phase Two began in January 2021 and now concludes with the publication of this report. Phase Two builds on the analytics and strategy of Phase One to synthesize specific physical responses for Arlington, Fairfax, and SciTech, and more broadly to define substantive principles that can be used to evaluate future opportunities across all of Mason's land holdings. In total, the framework consists of principles; policy guidance; data sets and tools; physical plans describing land use, open space, and potential building footprints; ecological planning, infrastructure planning; and transportation and mobility planning.

PRINCIPLES

A key difference between a framework and a traditional master plan is the delineation of substantive principles that can be applied to future opportunities not anticipated when the plan was created. These principles transcend a specific campus. Instead, they provide a philosophy to guide Mason's capital investment across all its landholdings. The principles are the end result of a highly collaborative two-year process that relied on extensive analysis. They are a distillation of lessons learned and key planning ideas, and as such represent a summary of the framework study and the broad input from the Mason community.



- can take advantage of university programs and opportunities.
- County.

1. Put strategy first. Mason is a large innovative university. This is the secret to its success, but it has also, from time to time, led the university to make decisions reactively and opportunistically, without reference to a broader vision. A key success of the master plan has been to establish programmatic identities for each of Mason's three primary campuses. It is crucial these programmatic identities, and the university strategy from which they result, drive capital investment.

2. Be compact. Academic activity should be concentrated within a compact core so as to maximize opportunities for collaboration and efficiency. This compact academic core should be surrounded by student life and other active uses to create vitality and a 24/7 sense of place. A compact campus also supports Mason's equity goals: by definition, a compact campus is a more accessible campus where every student

3. Make every dollar and every square foot count. Mason must prioritize the efficient use of existing resources. This requires good information on how its space is used, and how space allocations generate positive outcomes. Mason must reinvest in existing facilities, and control its deferred maintenance backlog. No single capital investment should be made independently, but instead must connect to a larger idea or sequence that maximizes the suitability of the university's entire facilities portfolio. Similarly, the university must invest in exterior spaces and infrastructure. Buildings and open space should work seamlessly to achieve framework implementation.

4. Connect places, people, and communities. Mason's physical identity must prioritize good experiences and respond to the importance of aesthetics in the built and natural environment. This means creating physical connections between places, buildings, and districts; providing clarity so people can easily navigate the environment; and opening its campuses to their host communities, welcoming not only internal, but also external, connections. In particular, the university must be a good partner to Arlington County, Fairfax City, Fairfax County, and Prince William

5. Embrace environmental stewardship. Mason should embrace the natural world, the objects, buildings, and systems placed in this world, and the people who inhabit its places and spaces, so the system as a whole can achieve balance. Mason is blessed with significant natural ecological resources. It has also committed to achieving carbon neutrality. For these reasons, Mason must act as a good steward, using its capital resources to preserve and enhance its natural ecology wherever possible, and more broadly, to act sustainably and address climate change. When considering private-public partnerships for remote parcels, particularly undisturbed areas, Mason should consider ecological and environmental impacts as part of any related planning studies.

SPACE POLICY GUIDANCE

Given the principle of maximizing every square foot on campus, the master plan makes several space management policy recommendations. These recommendations focus on the need to gather and analyze data to understand how space is assigned and used, and to base on-going and future space assignments on this productivity and utilization data, not legacy space assignments. No space assignment should be considered permanent. Specific commentary is provided for instructional space, research laboratories, workspace and offices, and collaboration space.

KEY PHYSICAL PLANNING IDEAS

The principles outlined above summarise the framework's philosophy. They should be regarded as a top-level summary of the master plan's intentions. Of course, the master plan also includes physical planning and design ideas that reflect these principles. The key physical planning ideas are:

- the campus more welcoming.

- managed east-west streets.

1. For Arlington, future development of the existing campus should focus on enhancing connections between buildings and on an improved plaza experience that makes

2. For SciTech, the master plan emphasizes connections with the planned Innovation Town Center, inviting the community onto campus, and establishing a new "main street" where academic initiatives and private sector partnerships can intersect.

3. The Fairfax campus must maintain its compact academic core. This core should be structured around three linked guadrangles: a new northern gateway guad that could potentially be a future home for the School of Business, a central guad adjacent to the Johnson Center with renewed facilities for the interdisciplinary science, engineering, and other programs, and the existing southern quad. Crucially, the existing compact academic core can likely contain all future academic development envisioned by the plan, and so the university should not disperse academic activity.

4. The compact academic core should be surrounded, and enhanced, by a reinforced student experience. In particular, residential life should no longer be concentrated to the east, but should be rebalanced, with significantly reinforced communities north and west. Recreation and well-being should also be an important component of this reinforced student experience, located close to student residential populations. The idea is to surround the academic core with a 24/7 sense of vitality and activity.

5. The identity of the Fairfax campus, and its sense of connection, could be radically improved by reinforcing its ecological and transportation systems. The two key ideas are the creation of the Necklace, a new linear park along the campus' restored stream corridors, and the disaggregation of Patriot Circle through a reimagination and reinforcement of north-south vehicular traffic flows, and the introduction of

KEY PHYSICAL PLANNING IDEAS





Fairfax—compact academic core with three quads

Fairfax—surround academic core with reinforced student experience

Fairfax—identity and connection reinforced by ecological and transportation system



SciTech—critical to connect to Town Center







ARLINGTON

Once the New Building at Mason Square (formerly known as the IDIA Building) is completed, Mason will essentially have built-out its land holdings in Arlington. The master plan therefore focuses on improved connections between buildings, and on reimagining the front plaza as a welcoming community resource. The intent is to create "Mason Square"—a major address on the Rosslyn-Ballston Corridor.

The existing plaza should be reimagined to create a great civic space that provides a benefit for both Mason and its broader host community. Since the plaza is built above the garage, raised planters are needed so trees can provide shade and improved urban ecology. The plaza should be active, with appropriate surrounding ground floor uses like retail and food options. The New Building project will begin this transformation. The master plan suggests a café or activity space could be introduced in a glass pavilion on the street edge at a later date to further activate and energize the space and the street.

We also suggest the introduction of a programmable sky bridge between Vernon Smith Hall and Van Metre Hall. The exact size of the bridge, and how many floors it physically connects, will depend on available funding, but the idea is to provide meeting and collision space where occupants of either building can converge and collaborate.

Finally, Mason should work with Arlington County to explore the possibility of a midblock crossing for Fairfax Drive.





FAIRFAX

The key physical planning ideas provide a clear direction for the Fairfax campus: a compact academic core structured around three linked quads, surrounded by three balanced residential life neighborhoods, with good proximity to recreation, and with the identity and navigability of the campus enhanced through the creation of the linear park Necklace, and the disaggregation of Patriot Circle. Within this broad structure, the plan focuses on potential building sites, street alignments, and other important details.

After careful discussion, including extensive debate with Mason alumni, the master plan recommends the demolition of the four historic buildings and the old Lecture Hall in the northern part of campus to allow for the creation of the northern quad. This recommendation, while not unanimous, was supported by a significant majority of participants in the process, who recognized the importance of meeting the needs of a modern research building and creating healthier buildings. All participants supported memorializing the historic buildings through both virtual and/or physical exhibits.

The master plan also recommends the demolition of David King and Planetary Halls to allow for the creation of the central quad. These facilities could be replaced in part by a new Interdisciplinary Science and Engineering Building. The master plan recommends the creation of a Science and Engineering sector plan that covers all relevant facilities on each of Mason's campuses to outline a careful phased approach for building renovation, demolition, and new construction. This recommendation has been incorporated in the six-year capital plan.

Mason's compact academic core should be surrounded by residential life and recreation and well-being facilities. In particular, the northern and western residential communities should be significantly increased so each can achieve critical mass and thereby balance residential life across the campus. Outdoor recreation fields should move on to the core campus, closer to the residential population, and outdoor athletic fields should be concentrated on west campus. A new recreation and well-being building could be built connected to SUB-I, allowing for the integration of health, well-being, and recreation in a location that provides the best achievable proximity to all existing and planned student residential neighborhoods.



Fairfax- Long-term Vision

The southwest quadrant of campus should be reserved for appropriate student housing and retail partnerships.

Faculty and staff housing is a near-term priority for Mason, and the plan suggests the Tallwood property is suited for this use (assuming the Osher Institute for Lifelong Learning is first relocated). The plan also shows options for faculty and staff housing on west campus.

These program developments should be supported by ecological and transportation connections. In particular, the new linear park Necklace will form a "Green Belt" and become a crucial part of Mason's identity, providing important multi-modal connections, while also supporting art and cultural exhibits, and the creation of an Arts District that includes the new pond amphitheater, Holton Plaza, Concert Hall, Buchanan Hall Gallery, Harris Theatre, Music-Theater Building, and Art & Design Building. This could be further enhanced by the introduction of a Contemplation Center and an amphitheater on the Necklace, next to the pond. The master plan further establishes a typology of ecological zones with recommendations for plantings, maintenance, and design approaches. The existing forests on west campus and Shirley Gate are preserved.

Transportation ideas hinge on the reconfiguration of Patriot Circle, with primacy given to the north-south streets, while the east-west portions are converted to managed streets. To accommodate development, some parking may need to gradually migrate to west campus with an enhanced shuttle service. Significant parking resources, including accessible parking, remain within the core campus.

The master plan also looks at longer-term considerations. While academic needs during the life of the plan can likely be accommodated within the existing compact academic core, if many years from now, additional land is needed, the master plan suggests the enlargement of the academic zone to the current arena district, with the arena (eventually) migrating to west campus as part of a consolidated athletics district.





SCITECH

Connections to the planned Innovation Town Center are critical to SciTech's future success. The master plan therefore proposes the creation of a "main street" where Town Center and academic activities can intersect. Mason should invite the Town Center onto campus through a series of new P3 partnership buildings on the southeast side of the new main street. These buildings should include active ground-floor retail uses like restaurants and coffee shops with appropriate innovation and research partnerships or student life facilities above. The campus side of the new main street will host a new Life Science and Engineering Building, positioned to further activate and engage the main street, along with important existing facilities like the Hylton Performing Arts Center. The master plan further envisions a major new gateway to the campus on the main street with a new building, envisioned, for example, as a home for a potential new School of Medicine.

To accommodate this development, parking shifts eastward (with no loss to the overall number of parking spaces available), and several other roadways and pedestrian paths are realigned to promote connection and efficiency. Natural areas on the campus are preserved as a significant resource for learning, research, and sustainability.

HERITAGE EVALUATION

The heritage evaluation identified and catalogued places of historic and cultural value across the Fairfax campus. It analyzed some of the oldest buildings on the Fairfax campus to determine their historic architectural value, and the likely ease of their conversion for modern uses. This analysis centered on the six buildings surrounding the original academic guad – East, Fenwick A, Finley, Krug, the Lecture hall, and West buildings. We recognize this is a sensitive topic, particularly as these historic buildings were the first on campus, and represent the totality of the Mason experience for many alumni. At the same time, the buildings must also be looked at through a lens of practicality. Our aim was to identify nostalgic value, historic value, and the likely return on reinvestment. The analysis determined Fenwick A should be preserved, but the original four historic buildings and the Lecture Hall should be replaced with buildings that can support modern pedagogy and research. Once removed, the historic buildings should be memorialized through appropriate virtual and/or physical exhibits.

SUSTAINABILITY

Mason embraces all aspects of sustainability and the United Nation's sustainable development goals. The master plan indirectly supports many of these goals, but its specific focus is on environmental planning and on infrastructure planning. Mason is currently working on a companion climate action plan which will address the university's carbon neutrality goals, and the Mason Sustainability Council is developing an overall Sustainability Action Plan for sustainability writ large. The master plan should therefore be read as a component of these coordinated efforts, which it fully supports.

TRANSPORTATION

The plan's primary transportation goals are to:

- surrounding areas
- Advance the university's sustainability agenda by investing in, and encouraging the use of, low-carbon modes of transportation
- Increase safety for all by reducing conflicts between transportation modes
- Reduce the university's financial burden by generally avoiding the construction of new parking decks and surface lots
- Accommodate the university's growth and need for new facilities
- Maintain appropriate levels of access for users with accessibility needs

The primary strategies to accomplish these goals include: continuing Mason's evolution from a car-oriented commuter campus into a multimodal campus; the removal of mobility barriers from campus edges; and continued decrease of per capita parking demand through enhanced transportation demand management within the constraints imposed by limited public mass transit options, particularly in Prince William county.

ENVIRONMENT

George Mason's campuses are inextricably linked to their natural settings, and offer rich biodiversity, from oak-hickory forests to stream corridors and wetlands. Protecting and celebrating Mason's natural setting must be an enduring ecological planning principle that sustains a strong relationship to nature and engagement through a range of programming and conservation. The master plan therefore continues a tradition of stewardship to engage campus buildings and open spaces with the natural landscape,

· Improve connectivity within the campuses and between the campuses and their

and encourages its inclusion in the academic curriculum. It defines a series of landscape typologies with suggested plantings and maintenance levels. Mason's core framework principles as described above are therefore further supported by several key ecological planning ideas centered on: protecting and strengthening ecological corridors and connectivity; recognizing and celebrating natural features; and activating outdoor learning and research.

INFRASTRUCTURE

The master plan examined existing utility infrastructure at Arlington, Fairfax, and SciTech, and the impacts of proposed development on these utilities. In particular, the plan considered requirements for heating and cooling, power, natural gas, potable water, sanitary sewer, and telecommunications for new facilities.

The plan recommends two ground source heat pump central plants and borehole fields with new low-temperature hot water and chilled water piping distribution to all new buildings for the Fairfax campus. At SciTech, we recommend a different approach, with a distributed model of air source heat pumps. We advise potable water network expansion and reconfiguration at both the Fairfax and SciTech campuses to add service to new buildings, realign existing mains beyond the footprint of the proposed development, and to add network resilience. Sanitary sewer network expansion and reconfiguration is similarly advised at both the Fairfax and SciTech campuses. Once the new building is completed on the Arlington campus, the university's landholdings will be built out, and so future infrastructure investments in Arlington should focus on appropriate maintenance needs, and any action items emerging from the climate action plan.

The master plan supports the university's goal of carbon neutrality, and ideas begun in the master plan are being advanced as an immediate priority through the creation of a climate action plan.

SUMMARY

Mason's physical spaces should exemplify what it means to be an educational and research institution. The university's devotion to the creation and distribution of knowledge and creative works is central to its mission and should be displayed throughout its physical environments.

The university's new master plan therefore seeks to instill an appropriate culture and mindset--an approach developed collaboratively by the Mason community--which will allow it to act in a strategic and planful manner to ensure its physical campuses support and enhance its strategy and mission.



INTRODUCTION



SUMMARY OF PHASE ONE

Master plan development was structured over two phases. The first phase of work began in January 2020 (just before the onset of the pandemic), and concluded in December 2020. The initial purpose was to collect and analyze relevant data, both hard and soft, so as to provide the university with an accurate accounting of the state of the institution from a physical planning perspective. The broader strategic goal was to establish a data-informed programmatic identity for each of the three primary campuses. These identities now inform the physical planning ideas of Phase Two.

The major tasks and findings of Phase One were:

- Analysis of the use of existing space;
- Analysis of program connections;
- Analysis of future demographics and enrollments;
- Physical analysis of the three primary campuses;
- Broad and intentional stakeholder engagement;
- Analysis of potential future (space) needs;
- Program identities of the three primary campuses.

Please see the Phase One Progress Report for details.

Policy Professional Partnerships ARLINGTON



Core Collaboration ergrad (and grad) home

FAIRFAX RENEWAL



SCITECH Medicine Innovation

Primarily a graduate campus

Collaboration Indergrad (and grad) home

FAIRFAX REIMAGINED

MASTER PLAN PROCESS TIMELINE

INTRODUCTION OF PHASE TWO



With the necessary analysis complete and clear program identities for each campus established, we have now developed the master planning framework in Phase Two. The phase included detailed assessments and planning for: infrastructure, parking and mobility, athletics, well-being, recreation, residential and student life, ecological resources, campus heritage and historic resources, land use, growth patterns, urban design and open space, real estate and the university's larger land holdings in the Fairfax area, and other related topics. The goal is to provide the university with the tool set it needs to make capital investment decisions moving forward and to ensure the creation of a dynamic environment that works seamlessly to support Mason's mission.



PRINCIPLES AND POLICIES



PRINCIPLES

A key difference between a framework and a traditional master plan is the delineation of substantive principles that can be applied to future opportunities not anticipated when the plan was created. These principles transcend a specific campus. Instead, they provide a philosophy to guide Mason's capital investment across all its landholdings. The principles are the end result of a highly collaborative two-year process that relied on extensive analysis. They are a distillation of lessons learned and key planning ideas, and as such represent a summary of the framework study and the broad input from the Mason community.

- can take advantage of university programs and opportunities.

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- 5. Embrace environmental stewardship. Mason should embrace the natural world, the objects, buildings, and systems placed in this world, and the people who inhabit its places and spaces, so the system as a whole can achieve balance. Mason is blessed with significant natural ecological resources. It has also committed to achieving carbon neutrality. For these reasons, Mason must act as a good steward, using its capital resources to preserve and enhance its natural ecology wherever possible, and more broadly, to act sustainably and address climate change. When considering private-public partnerships for remote parcels, particularly undisturbed areas, Mason should consider ecological and environmental impacts as part of any related planning studies.

SPACE POLICY GUIDANCE

The framework establishes the principle that every square foot counts. This requires Mason manage existing space as effectively as possible. The framework therefore outlines several policy stances that will maximize opportunities for effective utilization. This is particularly important as the university navigates a post-Covid environment, and establishes new patterns of work and learning that respond to the transformative effects of the pandemic experience.

- eternal, but instead must be managed, and will change over time.

1. Data is key. The university cannot manage what it does not understand. Regularly collecting and analyzing information on space is therefore the crucial first step of good space management. The university currently has good mechanisms in place which trace room square footage, room use, and departmental assignments. These mechanisms need to be reinforced and supported. Current gaps in data management are discussed below with reference to specific space types. We note there is always a cost in gathering additional data, so the university will need to carefully calibrate the cost of increased data management with the gains from improved space utilization. Finally, we note that raw data by itself does not support good decision making; instead, this data must be analyzed and turned into actionable information.

2. Every square foot belongs to Mason as a whole. Space is a resource, and not a right. This does not mean that Mason stakeholders do not need space, or should not have access to space, but as with any limited resource, space assignments should be made so as to best support the university's mission. Because the university exists in a dynamic context, we must therefore recognize that space assignments are not

3. Make space productive. In general, space assignments should follow utilization data. Exactly how utilization is measured will vary by space type, and can become complex and nuanced. But ultimately how a space is used, and what is produced

in that space, should govern its assignment. Note these value judgements can be broad and wide-ranging. They can consider multiple factors, and may include nonnumeric considerations. The connection between space and strategy is important, and should be periodically reevaluated to make sure space assignments continue to maximize effectiveness.

- 4. Develop nuanced approaches for different space types. Different kinds of spaces have different space management challenges. Some easily admit utilization measurements; others less so. Some are best administered centrally; others locally. Specific guidance includes:
 - **a.** Instructional space. General purpose classroom space should be scheduled by the registrar's office, and a holistic rolling plan should be in place to ensure the overall classroom inventory has an appropriate range of configurations, furniture, sizes, and technology to meet Mason's ever evolving needs for teaching and learning. Specialized instructional spaces should be scheduled through the relevant departments, although Mason should track this use centrally. Control of non-scheduled (open) labs should also remain with relevant departments, but Mason should periodically re-evaluate these assignments to make sure they are needed.
 - b. Research laboratories. Because research laboratories are expensive, their assignments are critical. Mason's research program is relatively young, and the university therefore has the opportunity to establish best practices from the outset. The university should expect research laboratory assignments to produce measurable results, whether this is in sponsored funding, or research publications, or other similar metrics; and ongoing assignments of research space should depend on these results. Relevant data will therefore need to be collected. The university should also look to establish research cores with shared equipment, and to promote flexible bench configurations, and opportunities for interdisciplinary collaboration.

With respect to office guidelines, the university currently maintains a cumbersome set of interior space standards for office facilities. These provide design guidelines for new construction and renovation projects with varying maximum office sizes for 19 different employee types (based on job title). We recommend a philosophical shift in the university's approach. Modern best practice moves away from a job-title based system to a system that considers functional needs. A new taxonomy built around this idea would need to be carefully considered, but could, for example, include individual workstations, collaborative workstations, collaboration/meeting space, and support spaces. We have seen variations on this approach where the individual workstation category is further refined to differentiate between people who need to host

c. Workspaces. The framework recognizes that workspace, and in particular office, assignments are complex. In particular, having had a chance to engage directly with faculty, we recognize that many faculty (particularly tenure and tenure-track faculty, and faculty with advising responsibilities) feel strongly that having a private office is essential for their ability to undertake scholarly activity and meet with students. These must therefore be critical considerations in any future discussions. At the same time, given the experiences of the pandemic, including increased work from home, and the needs of non-tenure track faculty, particularly adjunct faculty, who often do not currently have significant access to on-campus workspaces, we heard a small but growing number of voices who were interested in better understanding emerging trends in office hoteling and more flexible workspaces. Administrative staff also need to be active part of this conversation, where again, a range of solutions based on specific needs should be considered. In general, the university should consider workspace needs on a project-by-project basis, so that during the term of any given space assignment, the space is configured to meet the requirements of the user groups involved, while also looking for opportunities to improve efficiencies and incentivize exploration of alternative configurations where sensible.

meetings (typically an executive function like, for example, a departmental chair), or people with specific privacy needs, or storage needs, or advising needs, or class preparation needs, or research needs, etc. The chief point is that an appropriate system can greatly reduce and simplify the needed categories, and can better ensure that provided space matches employees' functional requirements. The development of a suitable rubric of this nature should be a near-term priority for Mason. Additional data collection would also be valuable as the university does not currently fully track workspace occupancy.

d. Collaboration space. Mason should actively monitor the quantity, quality, and distribution of its collaboration spaces. The pandemic has taught us that bringing people together on campus is most meaningful when people interact and collaborate. This suggests a potential shift in emphasis which might change the ratio of private space to public space in work and study environments. Of course, this conversation will be nuanced, and will depend on the active involvement of faculty, staff, and students, but ultimately Mason as a community will need to decide how to spend its limited capital resources so as to best achieve its strategic objectives. Informal learning and collaboration spaces, and outdoor learning spaces, are also important, and Mason should continue to actively invest and manage these spaces. Collaboration and engagement spaces that support hybrid learning should also be considered in residence halls. Finally, the university should consider how best to support student success space needs, including spaces for advising, coaching, and student services. This should link to the work of the university's Student Experience Redesign project that is evaluating options for centralizing some of these services.

ECOLOGICAL PRINCIPLES

The master plan embraces the university's broader sustainability agenda, which informs multiple aspects of the plan, from transportation to social justice to infrastructure. Sustainable action is therefore a core principle of the plan, and requires new approaches to environmental stewardship.

Encompassed by a rich biodiversity from oak-hickory forests to stream corridors and wetlands, George Mason's campuses have been inextricably linked to their natural settings since the Fairfax campus' founding in 1949. Protecting and celebrating George Mason's natural setting has been an enduring ecological planning principle that continues to sustain a strong relationship to nature and engagement through a range of programming and conservation. The master plan continues a tradition of stewardship to engage campus buildings and open spaces with the natural landscape and encourages its incorporation into the academic curriculum.

George Mason's faculty, staff, and students all benefit from a system of campuses that promote a natural landscape that is also ecologically functional. These spaces provide valuable ecosystem services that include:

- flood and erosion control
- groundwater recharge
- carbon sequestration
- microclimate regulation
- aquatic habitat
- purification of water and air
- seed dispersal
- food sources for native wildlife
- wildlife and pollinator habitats



Campus regional context: ecological corridors and habitat fragments

- Site Locations
- Virginia Local Park Inventory (points)
- ESRI Green Infrastructure Habitat Cores
- ESRI Green Infrastructure Habitat Connectors
- ESRI Green Infrastructure Habitat Fragments
- The Nature Conservancy Regional Habitat Cores

- refugia for flora and fauna in the university's broader suburban context
- pest control
- educational, research and recreational spaces
- cultural, intellectual, and spiritual inspiration

These natural areas contribute to the identity and aesthetic of George Mason's campuses, provide a space for student recreation to help relieve stress, allow students to connect with nature, and provide opportunities for learning and research.

CORE ECOLOGICAL IDEAS TO SUPPORT A LIVING CAMPUS

To support framework principles and help Mason realize the full living potential of each campus, the plan's core ecological ideas each encompass a suite of activities in planning, design, and restoration:

- habitats across scales and typologies.
- regimes to accommodate more forms of life.

• Protect and Strengthen Ecological Corridors and Connectivity. Animals move across landscapes and campuses, so finding ways to weave their pathways through and alongside our own is a key ecological theme. Whether placing stormwater planters to allow pollinators to traverse a parking lot or creating the green Necklace as a central feature of the Fairfax Campus, this plan connects patches of natural

• **Recognize and Celebrate Natural Features.** The streams, meadows, and patches of forest on George Mason campuses support a web of ecological functions. Allowing these salient natural features adequate space to fulfill their potential as ecological refugia and contemplative space can mean buffering streams, considering habitat guality fragmentation in the placement of gathering spaces, or adjusting mowing

• Activate Outdoor Learning. Inviting students and faculty outside means providing spaces and features that can be integrated into the classroom. These could be natural areas with permanent research plots that monitor ecological trajectories or gathering spaces near streams where inspiration from nature can infuse conversation.

ECOLOGICAL TYPOLOGIES

Given the multitude of uses and demands on campus spaces, we developed ecological typologies to direct attention to what is possible and appropriate for four different levels of use. These four typologies are depicted in the map of the Fairfax Campus and include: Type A-the Civic Landscape, Type B-Perimeter Landscapes, Type C-Civic Preserves, and Type D-Campus Preserves. Maps defining these typologies for the Sci-Tech and Arlington campuses are also provided.

The typological approach is additive along a scale of population density and maintenance efforts. In areas characterized as Civic Landscape, where the focus is on the built landscape, increasing the native species planting palette might be the only plausible improvement in light of limited space and safety considerations. In less constrained settings, such as Perimeter Landscapes and Civic Preserves, additional management tools such as creating vertical structure in a stand of trees may be possible.

In all typologies, the core ecological themes persist: protect ecological corridors, celebrate natural features, and activate outdoor learning using landscape and design tools appropriate to the typology.

Please see the appendix for a detailed discussion of the ecological plan.

Type A—The Civic Landscape

Suitable for areas of high use, with high numbers of people and related high levels of building density. Maintenance will be important. Typified by traditional campus quadrangle with suitable tree plantings.

Type B—Perimeter Landscapes

Suitable for more peripheral areas with lower population densities, but still with some campus facilities like surface parking and/or playing fields. Maintenance needs should be minimized with a more meadow-like condition with natural grasses and a tree perimeter. Under story should be controlled to ensure good sight lines.

Type C—Civic Preserves

Suitable for restored stream corridors or emerging habitat zones. Typically, a forest environment with a managed under story to promote safety, sight lines, and accessibility. Pedestrian and bicycle activity should be sensitively integrated within these zones. Habitat restoration is a priority.

Type D—Campus Preserves

Suitable for untouched or fully-restored natural habitats. Areas should have no (or at least minimal) built conditions, although learning and research activity is encouraged. Typically a native forest condition with interventions limited to forest management best practices.



FAIRFAX CAMPUS Landscape Typologies

Tallwood Faculty/ Staff Residential

TYPE C **CIVIC** PRESERVES

Stream environment, forest and managed understory for sightlines, safety, and access.

Braddock Rd





TYPE D CAMPUS PRESERVES

Natural habitats.



INTRODUCTION



ARLINGTON

ORGANIZING IDEAS FOR ARLINGTON CAMPUS

ORGANIZING IDEAS

The New Building project at Arlington brings unique opportunities to the campus. It provides new space, new programs, and new activities, gives an opportunity to integrate private-sector partners within the university, and creates a chance to reimagine the Arlington campus as one connected and lively urban campus. The intent is to create "Mason Square"—a major address in the innovation district that stretches from Rosslyn to the Ballston Corridor.

The theme of connection—both within the campus and to the broader community drives the physical planning in Arlington. The resulting main ideas are:

- staff feel more engaged and able to collaborate.



1. The Plaza: Improve the front door experience of the campus by rejuvenating the plaza at the entrance so it becomes a more active and more sustainable space with a sense of place for students, faculty, staff, and the broader community;

2. The Bridge: Enhance the physical connections across the campus, especially the link between Vernon Smith Hall and Van Metre Hall, so that students, faculty, and



Specific design proposals are under development and may vary from what is shown here.

MASON SQUARE-KEY MASTER PLAN IDEAS

The master plan's intent is to provide principles from which specific future design ideas can be developed. The framework itself is not intended as a prescriptive design. In that context, we discuss two key ideas:

THE PLAZA

The courtyard should be transformed to be the major open space of the campus. Ideas like two elevated peastone courts with moveable tables and chairs, planted with bosques of trees and a mixture of tall grass, could become the main gathering place in front of the library. This will also provide a significant community benefit. Note the elevated planters are required, because the courtyard is built on top of the garage. Longer term, small pavilions for retail or special events can be introduced at the front of the plaza on Fairfax Drive to better activate the street. The university should work with the county to create a midblock crossing, or introduce a median or special pavement designation across Fairfax Drive to help improve pedestrian crossing.

THE BRIDGE

During an engagement session, Vernon Smith Hall was described as being isolated, especially the spaces on the 4th and 5th floors, where occupants can feel disconnected from other parts of the campus. We therefore propose a programmable bridge between Vernon Smith and Van Metre with active collaboration and collision spaces. The scale of the bridge will depend upon available budget. It could be a two-story sky lobby, or as much as a five-story addition between the buildings. The crucial point is that the bridge must not only serves as a corridor for movement, but also an anchor space for both formal and informal meeting and collaboration.





Existing below deck parking

STREET AND PLAZA

Plantings along the street, trees at the raised plaza, and a potential small café or activity pavilion help to create a more active and pedestrian-friendly urban environment.



THE PLAZA

The existing plaza sits on top of the garage. To transform it into an impervious courtyard, the surface needs to be raised and treated. The new space will have better and more diverse plantings, as well as furniture for students, faculty, staff and the broader community to enjoy.







STREET AND PLAZA (EVENING ACTIVITY)

Longer term, a small café or activity pavilion on the street could anchor activity and engage the sidewalk, the plaza, the New Building, Van Metre Hall, and Hazel Hall. The plaza should be active with appropriate surrounding ground floor uses like retail and food options.







ENVIRONMENTAL OVERLAY

The setting in an urban area does not preclude a strong environmental focus. Enabling desireable outcomes for storm water infiltration, species diversity, and heat island effect are possible with tree plantings, ground covers, and roof planting or solar panels.







THE BRIDGE (TWO FLOORS)

We propose a bridge above Founders Way to connect Vernon Smith Hall with Van Metre Hall. One option is to directly connect at the 4th and 5th floor with a programmable common space. The connection could potentially accommodate small teaching activities. Further study is needed to investigate similarities in elevations and floor-tofloor heights between the buildings.



THE BRIDGE

This option extends the collaboration space to all floors of Van Metre Hall. In this way, the connecting bridge could be used as a hub space vertically and horizontally, uniting the programs and buildings. The new hub is transparent so that it does not block sunlight to the alley, and can display the learning and socializing activities within.












ORGANIZING IDEAS

Our analysis of the various existing uses on the Fairfax campus directly informed our ideas for how to think of the campus moving forward. The organizing ideas therefore emphasize existing use patterns, while also fostering future growth.

We first analyzed academic uses, which occupy the campus core and are centered around two axes-one which runs north-south, and the other which runs east-west. These axes intersect at the Johnson Center, the foremost convening place on campus. Any future projects should seek to further densify the concentration of academic uses along these axes to reinforce the core as an academic hub. Most importantly, the existing compact academic core follows an exemplary pattern which promotes equity, interaction and collaboration, and which should be preserved; i.e. academic uses should not be dispersed outside of the core.

A second important campus use centers on the student experience—residential, athletics, recreation, and well-being facilities fall under this umbrella. These uses are currently largely located in a ring around the academic core, with the main residential community in the east and athletics, recreation, and well-being in the west. Further development should continue to surround the academic core, but should better distribute these active uses on all sides. Student services should reinforce the proposed cross axis which defines the major corridors of activity for Fairfax.

To ensure a strong connection between these uses, the university should reconsider circulation patterns around the campus. The loop road layout of Patriot Circle can be disorienting for those who are unfamiliar with the university and creates points of potential pedestrian conflict.



Planning starts with Mason's core institutional characteristics. The concentric circles then represent a hierachy of ideas: land use patterns support the university's character, and in turn are supported by its physical systems.

We therefore propose the university disaggregate Patriot Circle, with vehicular traffic focused on two north-south streets on either side of the academic core. This reinforces the academic core as primarily a pedestrian zone, increasing safety for all, and encouraging further densification of academic uses in the core. The east-west components of what is now Patriot Circle will become managed streets with a flush condition to accentuate their pedestrian nature. Accessibility, shuttle service, delivery, service, and emergency access will, of course, continue.

Campus open space is another important topic. The academic core will be organized around three linked quads. In addition, the proposed Necklace linear park promises to be an integral part of the circulation network. Design ideas promote alternatives to vehicular travel with a particular emphasis on pedestrian and bicycle movement, including the creation of dedicated bike paths. The Necklace also provides a wonderful opportunity to engage with nature and valuable space for contemplation; art; historical, botanical, and cultural markers; and recreation.

We undertook a heritage evaluation that identified and catalogued places of historic and cultural value across the Fairfax campus (please see the appendix for details). It focused on an analysis of some of the oldest buildings on the Fairfax campus to determine their historic architectural value, and the likely ease of their conversion for modern uses. This analysis centered on the six buildings surrounding the original academic quad – East, Fenwick A, Finley, Krug, the Lecture hall, and West buildings. We recognize this is a sensitive topic, particularly as these historic buildings were the first on campus, and represent the totality of the Mason experience for many alumni. At the same time, the buildings must also be looked at through a lens of practicality. Our aim was to identify nostalgic value, historic value, and the likely return on reinvestment. The analysis determined Fenwick A should be preserved, but the original four historic buildings and the Lecture Hall should be replaced with buildings that can support modern pedagogy and research. Once removed, the buildings should be appropriately memorialized through appropriate virtual and/or physical exhibits.





LAND USE

The diagrams on the following pages show proposed land uses on the Fairfax campus moving forward. The academic core is in the heart of campus (shown in pink). At present, nearly all academic facilities are located within this core, along nascent north-south and east-west axes, which intersect at the Johnson Center. This academic core must be preserved, but it must also be better connected, further densified, and given a greater sense of structure through improved open space. The nascent axes should be made explicit, and a series of three linked quadrangles should supply the underlying structure.

Our on-campus residential communities (shown in yellow) should continue to surround the academic core. Currently, the largest concentration of housing is to the east, with the Rappahannock Neighborhood and The Commons to the northeast and the Shenandoah Neighborhood and Presidents Park to the southeast. The much smaller Aquia Neighborhood lies to the west. Masonvale is in the far northeast corner of campus, a townhome-style faculty, staff and graduate student housing neighborhood. Future student housing projects should seek to more evenly distribute residential life, rather than maintain the current eastern focus, so as to establish a critical mass in each district and balance vital nodes around the academic core.

An events district lies to the south of the core. It includes Eagle Bank Arena and its associated parking lots. Note that on-campus events are not restricted to this specific zone, but occur in multiple locations, particularly in the Arts District

The recreation and well-being district is located west of the core and contains the Recreation and Athletic Complex (RAC) and recreation fields. Further development in this district could include expansion of the RAC and its conversion to a basketball



practice facility for use by athletics. As one alternative, we propose a new recreation and well-being building connected to SUB-I which can align with ongoing efforts related to Student Experience Redesign, and in particular, allow for the concentration of student services related to well-being, including counseling and health services. Of all potential locations, this is the one that is closest to all proposed residential districts and the academic core. The university is also exploring other options to meet athletic and recreation needs, including the continued use of the RAC for recreation.

The athletics district is located on West Campus, across Ox Road. This district currently houses the Field House as well as various fields and courts. Due to this area's distance from the campus core, this district's primary use should remain for athletics. In fact, athletics facilities should be further concentrated in this neighborhood, with recreation fields migrating east onto the core campus. Note this does not preclude the idea of locating faculty and staff housing on west campus as discussed below.





FAIRFAX FRAMEWORK

The following pages show a framework for the future of the Fairfax campus, consistent with the land use patterns discussed above. Dark pink buildings are proposed, light pink are existing, and dashed outlines are potential removals/demolitions. It is important to note that the proposed buildings and fields do not represent a specific future project, building footprint, or design, but rather suggest a framework for future projects whereby landscape and buildings can work as one. All future buildings will need to undergo more detailed siting and design studies before ground is broken.

The framework shows various proposed buildings along the primary axes of the academic core, with three connected quads (shown in light green) from north to south. The concept of these three connected quads, combined with new buildings, further densifies the core and solidifies its status as an academic district for pedestrians.

In order to form the new northern quadrangle, with new academic buildings suited to modern pedagogy and research, the master plan recommends the removal of five original buildings—East, Finley, Krug, Lecture Hall, and West. As discussed in detail in the appendix, the heritage evaluation suggests these buildings are past their useful lives and not good renovation candidates. They should therefore be removed. The buildings should be memorialized through both virtual and/or physical exhibits. The new northern quadrangle also offers an opportunity to receive and enhance a stronger connection with the City of Fairfax which creates the potential to activate a "college town" feeling for everyone's mutual benefit.

The plan proposes a new student innovation factory on the far east side of campus. This will be a location for students to undertake projects, and the proximity to the campus

central utility plant is intentional, to allow for real-world experimentation and exploration of sustainable practices.

Buildings around the new northern quadrangle should be academic in nature, and would, for example, make a good location for a new home for the School of Business, and for a welcome center.

In order to allow for the demolition of Planetary and David King Halls, we recommend a new Interdisciplinary Science and Engineering building on the new central quad. The building is sited so that it can be constructed without requiring the demolition of any existing buildings.

The master plan proposes a new nondenominational Contemplation Center with suitable multipurpose gathering space at Mason Pond. The pond is also a good site for a new amphitheater

For residential, the framework calls for an expansion of housing on both the north side of campus around Peterson Hall and on the west side of campus in the existing Aquia Neighborhood. This western neighborhood should be further reinforced with the introduction of an on-campus retail zone. Retail in this area is envisaged at the scale of a small urban department store. Retail within the residential districts themselves should be smaller scale, and more intimate. Addressing increased dining needs on campus through restaurants and cafes would be a good use.

In order to support ongoing faculty and staff recruitment, the plan proposes faculty and staff housing on the Tallwood property. The Osher Lifelong Learning Institute will need to be relocated first. The plan also describes opportunities for faculty and staff housing on west campus.

We suggest a new recreation and well-being center connected to SUB-I which will allow for an integrated approach to student health. Please see the appendix for a detailed study on this potential facility.

The framework also considers various ideas for student athletics, and specifically basketball practice facilities, including an option with an addition to Eagle Bank Arena. The university is independently studying other options.

The proposed Necklace linear park weaves its way around the academic core along the restored stream corridors, and provides space for recreation and contemplation.

Patriot Circle should be reconfigured with two north-south roads on either side of the campus core and with two proper east-west managed connections. This reconfiguration will require detailed study with careful attention paid to students and employees with disabled access needs, gate locations and associated technology, and specific street alignments and sections. Beyond the campus, we propose a stronger connection to Fairfax Town Center for bicyclists and pedestrians

Most of the proposed development takes place on existing parking lots. This change will be gradual, and can be managed sensitively. Significant parking reserves will remain on the core campus, and per capita parking demand is decreasing, so hopefully, parking will not need to be replaced on a one-for-one basis (if at all). If it does, the plan proposes a gradual shift to west campus, with improved shuttle services. This remote parking trend is typical of Mason's research-intensive peers. Note this shift may require Mason to revisit its budget model with peer universities typically moving from an emphasis on parking fees to transportation fees. When parking lots are moved or redesigned, Mason can consider opportunities to integrate sustainable infrastructure.



FAIRFAX REIMAGINED Athletics alternative



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ACADEMIC

The framework for the academic core builds upon the concentration of academic activity along the two perpendicular axes in the heart of campus, and the proposed system of three linked quads. Each academic quad should be neatly framed either by existing or proposed academic buildings. The central quad will also serve as an important nexus for student life, given its location at the crossing with the major east-west axis, along Wilkins Plaza, and next to the Johnson Center—a hive of activity and favorite convening space of students, faculty, and staff.

At the northern end of the core, we propose the demolition of East, Finley, Krug, the Lecture Hall, and West to make way for construction of four new academic buildings containing around 420,000 gross square feet (GSF) to frame the new northern quad.

Along Wilkins Plaza, we propose the construction of a new 35,000 GSF academic building and the demolitions of David King and Planetary Halls with an accompanying new 120,000 GSF interdisciplinary science and engineering building.

On the west side of the core, along the future necklace corridor, we propose a new 110,000 GSF academic building overlooking Mason Pond. Our final proposed building is a 45,000 GSF student projects building, or student innovation factory, located outside the academic core on the far east side of campus; its location chosen for its proximity to the central plant.



Fairfax Town Center, 1 mile



Proposed Buildings

Existing and Retained Buildings

West Campus

Braddock Rd

 $\alpha > \alpha$

Sraddock Rd

EagleBank Arena

Field House



'FAIRFAX REIMAGINED' ACADEMIC DEVELOPMENT CAPACITY



Potential Demolition

Finley Building	19,300 GSF
Krug Hall	31,900 GSF
West Building	21,800 GSF
East Building	13,100 GSF
Lecture Hall	8,100 GSF
David King Jr Hall	85,800 GSF
Planetary Hall	100,600 GSF
Total	~280,000 GSF

Potential new construction

Roberts Rd

	~730,000 GSF
5 1 to 2 floors	45,000 GSF
4 to 5 floors	110,000 GSF
3 4 to 5 floors	120,000 GSF
2 4 to 5 floors	35,000 GSF
(1d) 4 to 7 floors	130,000 GSF
1c) 4 to 5 floors	75,000 GSF
(b) 4 to 5 floors	65,000 GSF
(a) 4 to 5 floors	150,000 GSF

FAIRFAX REIMAGINED

Academic life on Fairfax will be structured around three linked quads

WISUAL + PERFARTS

RESEARCHHALL

AND TRAVELEVES.



ICK LIBRARY

WSON CENTER

SMIC LABORATORY

PETERSON FINLEY NEW ACADEMIC EAS KRUG HORIZON HALL HORIZON HALL





UPPER QUAD (LOOKING SOUTH FROM PATRIOT CIRCLE)

The removal of the original four buildings and the Lecture Hall opens up the Upper Quad as a large gathering space. Looking south, the Upper Quad is connected to the Central Quad through a walk with a tree canopy in front of Horizon Hall. The east-west managed street improves perceptions of safety and better connects the campus.







UPPER QUAD (IN MEMORY OF THE ORIGINAL CAMPUS)

Though the physical presence of the buildings will be removed, the memory of the original historic campus should be preserved. This should center on academic and educational ideas, and could include creating a physical exhibit, retaining significant trees, virtual tours, story apps or other virtual experiences, spotlights marking the old building edges, and/ or appropriate art pieces from student groups and alumni. The three quads will serve as the main iconic space of the campus around which future academic growth will occur.





UPPER QUAD (LOOKING NORTH TO PATRIOT CIRCLE)

Given the unique grade conditions, the quadrangle should terrace down from Patriot Circle to form a large level quad that can accommodate major and daily events. This space should be activated by the new academic buildings, with transparent ground floors along the edge. Existing trees are retained and blend into the new composition of the open space.



UPPER QUAD (NIGHT)

Choreographing active student focus work spaces on academic building ground floors would ensure evening vitality. The enhanced northern residential district means 24/7 activity should spill out into the quad, activating it both day and night.









CONNECTION TO THE CENTRAL QUAD

In this important transition space between the three quadrangles, interior environments and their facades will enable strong interior and exterior connections to maximize learning everywhere. This creates opportunities for students, faculty, and staff to engage with one another, both indoor and outdoor.



CONNECTION TO THE CENTRAL QUAD (NIGHT)

This enhanced experience could be extended to be 24/7 with appropriate lighting and programmed activities.











CENTRAL QUAD

The proposed demolition of David King Hall and Planetary Hall allows for the creation of a new quad at the center of the campus. The quad should become the exterior equivalent of the Johnson Center, which it would border. A potential new integrated science and engineering building could provide exciting intersection spaces for appropriate academic and student life activities.





LOWER QUAD

The existing strong forest cover in this quadrangle should be maintained and the under story should be simplified to encourage low meadow and/or groundcover. This would allow clear sight lines for evening safety and serve as an exterior "sculpture court" for the arts program that surrounds the quadrangle.

Removing shrubs and changing the under-canopy planting from grass to meadow would: 1) unify the image of the Lower Quad, 2) reveal the paths and surrounding buildings, and 3) echo the sustainable practices at the Innovation Food Forest on site.







RESIDENTIAL

While most Mason students are commuters, there is a sizable population of students living on-campus. To better understand current conditions, we carried out an analysis of both on- and off-campus residential options which included considerations of the rental market in our host community. This analysis then led to explorations for growth of on-campus residential life. We undertook a capacity study which shows the campus could accommodate 2,000-2,500 additional beds. Because of the pandemic, we did not undertake a market study, which should be conducted before any specific building project advances. As part of any future study, the university should consider the full range of student housing needing, including undergraduate, graduate, and family housing.



Fairfax Town Center, 1 mile



Proposed Buildings

Existing and Retained Buildings

West Campus

Braddock Rd

raddock Rd

Field House

EagleBank Arena



ON-CAMPUS RESIDENTIAL

The three main neighborhoods



Notes:

Global Center, Whitetop and Rogers are named as Aquia Neighborhood on the Campus Map. Liberty Square and Potomac Heights are named as Shenandoah Neighborhood on the Campus Map.

ON-CAMPUS RESIDENTIAL ANALYSIS

Most of Mason's on-campus beds are located on the east side of campus. Between the Rappahannock and Shenandoah Neighborhoods, there are over 5,200 beds, making up 85% of all beds on the Fairfax campus. Most of the remaining beds are in the smaller Aquia Neighborhood on the west side of campus, with just under 900 beds, or 15% of all beds on the Fairfax campus. Included in this count is the Mason INTO program's small residential component of 284 beds in the Mason Global Center. The university also has faculty, staff, and graduate student housing in townhouse-style apartments in the Masonvale complex, located at the far northeast corner of campus. Further afield, the university has 136 beds in a townhouse-style apartment complex for upper class students located just north of campus on Chain Bridge Road. The following pages show a breakdown of the number of beds by complex and by housing type.

ON-CAMPUS RESIDENTIAL

Number of beds



ON-CAMPUS RESIDENTIAL Building type



RENOVATING THE POTENTIAL BUILDINGS

FCI (Facility Condition Index)



RENOVATION AND RETROFIT

This map shows the Facility Condition Index (FCI) for residential facilities on the Fairfax campus. Most buildings are in either good or fair condition (colored dark green and light green, respectively) or recently renovated/rehabilitated (colored dark green with a yellow outline). A cluster of buildings in the Presidents Park complex are rated in poor condition (colored yellow). Two buildings in the Rappahannock Neighborhood, Commonwealth and Dominion Halls, are rated in critical condition (colored red). As such, these two buildings are prime candidates for renovation and retrofitting. We suggest some approaches to these renovations with a focus on adding additional common and collaboration space to the buildings. Another existing residence hall, Eastern Shore, presents an opportunity to convert existing common spaces to apartments for faculty-in-residence.

DOMINION AND COMMONWEALTH RENOVATION STRATEGY

Complement interior spaces by creating welcoming outdoor spaces.

DOMINION AND COMMONWEALTH RENOVATION STRATEGY Increase social spaces within the buildings.









DOMINION AND COMMONWEALTH RENOVATION STRATEGY

The university should consider more flexible interior configurations of bedrooms that include shared living rooms.



EASTERN SHORE HALL

Eastern Shore Hall could be renovated to include apartments for faculty-in-residence. We explored various configurations that convert existing social space within the building.





OFF-CAMPUS RESIDENTIAL

Representative off-campus apartments

REPRESENTATI OFF-CAMPUS APARTMENTS	VE	-				
	Scout on the Circle	Trillium Apartments	Fairfax Square	Modera Fairfax Ridge	The Ridgewood by Windsor	Gainsborough Court Apartments
Location:	Fairfax, built 2020, 400 units	Fairfax, built 1972, 604 units	Fairfax, built 1966, 502 units	Fairfax, built 2015, 192 units	Fairfax, built 2010, 483 units	Fairfax, built 1967, 151 units
Floorplans:	STUDIO:					
	1 BD : 639-670 SF 2 BD: 829-926 SF 3 BD: 1,259-1,391 SF	662-1,000 SF 1,000-1,131 SF 1,131-1,578 SF	811 SF 897 SF 1,171 SF	728-807 SF 838-990 SF	720-728 SF 1,023-1,056 SF 1,289 SF	700-702 SF 902-1,026 SF 1,116-1,350 SF
Drice Danger	STUDIO:					
Price Range:	1 BD : \$1,800-\$2,130 2 BD: \$2,250-\$2,420 3 BD: \$3,100-\$3,930	\$1,281-\$2,720 \$1,438-\$3,451 \$1,779-\$3,903	\$1,321-\$2,755 \$1,522 -\$3,335 \$2,107-\$4,594	\$1,761-\$2,644 \$1,902-\$2,537	\$1,530-\$2,100 \$1,790 -\$2,250 \$2,410-\$2,920	\$1,480-\$1,882 \$1,644-\$2,195 \$2,027-\$2,551
Amenities:	Pool, Dog Park, Lounge, Amazon Lockers, 9' or 10' ceilings, Fitness, Theatre, Game Room, Garage Parking (fee)	Pool, Tennis Court, Fitness Center, Trails, Balconies, Grilling Area, Pet- friendly, Lounge, Yoga Room)	Pool, Fitness Center, Game Room, Dog Park, Grilling Area, Pet-friendly	Pool, Fitness Center, Yoga Room, Clubhouse, Basketball Court, Pet-Friendly	Pool, Fitness Center, Lounge, Clubhouse, Co-Working Space, Grill Area, Pet- Friendly, Garage Parking (fee)	Pool, Fitness Center, Pet Area, Space, Grill Area, Pet- Friendly, Surface Parking

OFF-CAMPUS RESIDENTIAL

Off-campus apartment rents

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ON-CAMPUS VS OFF-CAMPUS RESIDENTIAL

Room rates per month



OFF CAMPUS RESIDENTIAL ANALYSIS

We examined the configuration and pricing of various popular off-campus housing options. We then compared the average rate, by room type, for on-campus housing to the average rate for one-, two-, and three-bedroom apartments off-campus. It shows an unusual pattern compared to similar environments for other universities: Mason has room rates which are competitive, if not lower, than those offered by off-campus providers, especially when it comes to single-occupancy spaces. Most peers have the opposite pattern. The map on the following page highlights the best known off-campus housing complexes in the surrounding Fairfax community, colored by price tier. Note that cost is only one factor in where students choose to live. The lack of direct public transit, for example, can be a challenge for students without a car, particularly for those taking night classes.

Note:

Data source: FY20 approved room rates for housing website.

On-campus room rate per month is calculated as room rate per semester divided by 3.7 months. Room rate per month for Townhouse \$1,207. The off-campus rates are listed as 4-month term per person.

OFF CAMPUS RESIDENTIAL Fairfax

Oakton Park Apartments

Trillium Apartments Scout on the circle

Fairfax Village Apartments Gainsborough Court Apartments Cavalier Court Apartments Modera Fairfax Ridge Apartments Camden Fairfax Corner Apartments Cardinal Court Apartments The Reserve at Fairfax

Finley At Fairfax Corner Apartments

Corner Apartments Novus Fairfax Gateway Layton Hall Apartments The Ridgewood by Windsor

West Wood Oaks Apartments eaves Fairfax City Apartments Fairfax Square

Campus boundary Student current address Commercial zoning area

Higher cost Middle price tier Value

0.75 miles (radius)

1.5 miles (radius)

. СЛ miles (radiu

THE RESIDENTIAL IDEA



THE NEW RESIDENTIAL IDEA

The new residential idea on the Fairfax campus calls for a more even distribution of housing around the campus, as opposed to the heavy concentration on the east side that exists today. The following page shows proposed clusters of new buildings to accompany existing residential neighborhoods on the north and west sides of campus. The work should be considered as a density study, rather than as prescriptive; i.e. it shows how much additional residential capacity Mason could add at Fairfax if demand existed. This is important because our demographic analysis in Phase One suggested that Mason's continued growth will increasingly emphasize out-of-state and potentially international students. New residential buildings will therefore be added over time, based on ongoing evaluations of needs.

On the north side, we propose the construction of a cluster of new buildings with ground floor small-scale retail to accompany the existing Rogers and Whitetop buildings, framing a new residential guad directly opposite the proposed northern academic guad. This cluster could have a footprint of 100,000 SF and could accommodate approximately 1,000 beds. On the west side, we propose the construction of a cluster of new buildings in a mixed-use residential/commercial district to accompany the existing Ángel Cabrera Global Center, framing a new residential guad overlooking Mason Pond.

The proposed retail zone offers a footprint of 109,000 SF, while the residential buildings have a footprint of 139,000 SF and could accommodate approximately 1,300 to 1,400 beds. These proposed projects could increase Mason's bed capacity by up to 40% if needed.

We also propose faculty and staff housing on the Tallwood property, which can accommodate 22 units. Additional options for faculty and staff housing are provided on west campus.



NEW RESIDENTIAL COMMUNITIES

We show the proposed western district as an example of how Mason's residential facilities could be reimagined. New buildings include active ground-floor uses with collaboration spaces, small-scale retail, and food options. The buildings should also include significant engagement spaces. These could be structured around specific community needs, but could include collaboration space or learning space. One intriguing possibility is for a music-themed community that could include rehearsal and practice space. The buildings could also be purpose-built to include faculty-in-residence.

Collaborative work space, café, small retail

Ground floor/partial 2nd 140K GSF

Learning/collaboration/music Integrated in each building 80K GSF

Faculty-in-residence Integrated in each building 12-15 units @ ~900 SF/unit

Residential space 4 typical floors

~1,400 bed







WESTERN RESIDENTIAL DISTRICT

This perspective illustrates the idea of forming compact residential enclaves around the civic preserves of the campus. The ground floor is programmed to be active. The view looks west from Mason Pond towards the proposed residential district on the west side of campus near the Ángel Cabrera Global Center. Below is a photograph of the area as it appears today, which is primarily a parking lot.


BY ZONING



WEST CAMPUS OPTIONS FOR FACULTY AND STAFF HOUSING

Recruitment of new faculty and staff will be a critical component of Mason's strategic plan. One method of supporting this strategic objective could be for Mason to supply faculty and staff housing.

The plan recommends faculty/staff housing on the Tallwood property, just north of Masonvale and the possibility of additional housing on west campus.

We explored a scenario for the Tallwood property with 22 single family units on 50' x 100' lots.

We explored two scenarios for West Campus—the first proposes 130 single family units on 50' x 100' lots and the second proposes 610 apartment-style units at 1,200 square feet per unit and 47 single family units.

Note that use of the Tallwood property requires relocation of the Osher Lifelong Learning Institute, and use of west campus likely requires a relocation of the field house.

SINGLE FAMILY HOUSING SCENARIO

Faculty and staff housing could consist of a combination of single-family homes and apartments. The market will need to dictate future specifics and price points. A key goal should be to balance and diversify future neighborhoods rather than to create isolated, unconnected enclaves. We therefore explored two different scenarios. The first focuses on traditional single-family homes on 50'x100' lots. The plan accommodates approximately 130 of these houses in the first scenario. In the second scenario, we keep single-family homes adjacent to the athletic fields, but densify the parcels immediately adjacent to Ox Road. The second scenario provides over 600 apartment units.



APARTMENT ALTERNATIVE





ATHLETICS, RECREATION, & WELL-BEING

Today, Mason's athletics, recreation and well-being facilities are mostly concentrated in a district to the west of the campus core, on either side of Ox Road. Our vision brings recreational facilities closer to the center of student activities and largely consolidates athletic activity in an athletics district on West Campus. There are various methods the university could employ to achieve this vision, and Mason is independently studying multiple options. The master plan focuses on one potential solution, although this is not intended to be prescriptive. We suggest the construction of a new recreation and well-being center to the west of the academic core. This proposed facility would be located directly opposite SUB-I across Aquia Creek Lane, which is reimagined in this plan as a pedestrian plaza. The new recreation and well-being facility and SUB I would be connected via a programmable pedestrian bridge. New recreational fields and courts should be constructed near the RAC, in an area which is currently occupied by parking lots and the RAC Field. All facilities, fields, and courts to the west of Ox Road would be designated for athletics. These moves would make recreation and well-being services more accessible to all students and would provide additional real estate to athletics. Please see the appendix for a detailed study of these issues.

FAIRFAX CAMPUS ENVISIONED- ATHLETICS, RECREATION AND WELL BEING

Fairfax Town Center, 1 mile

Field House

Jraddock Rd

Shirley Gate

West Campus

Braddock Rd

Proposed Buildings

Existing Buildings

Athletics Fields

EagleBank Arena

New Recreation

Center



TODAY

Athletics and recreation uses are mixed east and west.



PROPOSED

The plan brings recreation uses closer to the center of student activity and residential life, and begins to consolidate athletic uses on west campus.



NEW RECREATION AND WELL-BEING CENTER

Connected to SUB-I and RAC/fields

NEW RECREATION AND WELL-BEING CENTER

Section showing the connection, especially over the stream









NEW RECREATION AND WELL-BEING CENTER

The plan suggests connecting a new recreation and well-being center to SUB-I in order to create a holistic idea of wellness and recreation. The bridge connecting the buildings will be programmable, and should be an active and visible zone of student engagement and collaboration.





THE EDGE AT WEST CAMPUS

The EDGE challenge course is currently located at SciTech. Given the number of students on the Fairfax campus, Mason should consider the possibility of a challenge course at Fairfax. The size of the challenge course precludes its integration on core campus, but it could be sensitively integrated into the natural environment on west campus. We provide two scenarios.

Scenario A



Scenario B

Total length: ~ 1.04 mile Dotal length: ~ 1.04 mile More constantion A tall elements 30 low elements Pro: More compact, disturb smaller area of forestry Flatter topo Closer to main campus and athletics facilities Cons: A thighland of the forestry Emitted space for EDGE More complex





THE NECKLACE

The neglected stream corridors on the Fairfax campus are an underutilized asset which should become the basis for a transformative green belt which we refer to as the Necklace. The idea is to create a significant V-shaped linear park that could become the defining experience for vistors to Fairfax. The idea builds on the existing stream corridor which starts in the south of campus, bifurcates, and flows on either side of the academic core. We propose turning this corridor into a multi-use greenway complete with forest, ponds, streams with riparian buffer, and paths for walking and biking. Along the length of the Necklace, there are opportunities for installation of public art and cultural exhibitions and interpretive signage, as well as construction of an amphitheater and non-denominational contemplation center overlooking Mason Pond.

The Necklace is one example of an important ecological typology. The plan establishes a clear taxonomy which also includes a forested buffer area around the perimeter of campus, the preservation of far West Campus as a forest zone, ecological connections made with native understory, and the conversion of outlying turf areas to meadows. Please see the appendix for a detailed discussion of these topics.

THE NECKLACE AND THE ECOLOGICAL COMPOSITION

3 **West Campus** Near-term preservation of the forest, research, faculty/staff housing and athletics fields.

4 Connection

Intentionally plant trees, native understory, and open meadow as connections between spaces to enhance ecological connectivity.

5 Meadow spaces

Outside of central core convert turf areas to meadow to further enhance ecological productivity and native pollinator habitat potential.

Core Campus

1 The necklace Forest, pond, stream with riparian buffer, walking paths, etc.

2 The 'buffer'

Connect forest patches at the edge of the campus to create a buffer zone from the context major roads

2







SECTION OF THE STREAM, NEAR THE POND With art + wider area near Mason Pond

Existing Section A





DEVELOPMENT AROUND THE NECKLACE







CONTEMPLATION CENTER

The university can integrate a new contemplation center into the Necklace at the pond. The building should offer flexible multi-purpose meeting spaces. It could be accompanied by an outdoor amphitheater and an active terrace level directly adjacent to the interior spaces. Given the existing grades, this terrace would be raised above the surrounding woodland preserve and stream corridor. The center could utilize the proposed arrival court for the arts at its north and east corner. The terrace could also host activities and opening for the sculpture court.







MOBILITY

PLAN GOALS

The transportation element of the master plan aims to accomplish the following goals:

- Improve connectivity within and between the campuses, and with surrounding communities.
- Further the university's sustainability goals by investing in and encouraging the use of low-carbon modes of transportation.
- Increase safety for all by reducing conflicts between transportation modes through the provision of adequate facilities and appropriate separation.
- Reduce the university's financial burden by avoiding the construction of new parking decks and surface lots where possible and revisiting the budget model to reflect a changing emphasis from parking to transportation.
- Accommodate the university's growth and need for new facilities.
- Maintain appropriate levels of access for users with accessibility needs.

STRATEGIES TO ACCOMPLISH PLAN GOALS

We propose to address these goals through the following primary strategies:

- 1. Continue Mason's evolution from a car-oriented, commuter campus into a multimodal campus
- 2. Address barriers to mobility (particularly pedestrian and bicycle mobility) on campus edges
- 3. Decrease the parking demand on campus per student/employee

Please see the appendix for additional details on transportation.

FAIRFAX REIMAGINED- MOBILITY

Fairfax Town Center, 1 mile

Shirley Gate

Main Streets

Shuttle- Fairfax to SciTech Shuttle- Mason to Metro Shuttle- Gunston Go-Bus Shuttle- Burke Centre VRE Express Shuttle- West Campus Shuttle Publicly Operated Potential Bus/ Shuttle Route University Operated Potential Bus/ Shuttle Route

Existing and Potential Bike Routes Pedestrian Paths

West Campus

Braddock Rd





COMMUTER CAMPUS INTO A MULTIMODAL CAMPUS

Despite the number of students, faculty, and staff living close to the Fairfax campus, the lack of pedestrian and bicycle connections to campus make walking or bicycling inconvenient or unsafe in many places. Roughly 20% of faculty/staff and off-campus students live within a 10-minute bike ride of campus. Still, most nearby residential neighborhoods lack bicycle connections that directly link to campus, as shown in the adjacent diagrams.

As shown in the first diagram on the next page, the neighborhoods to the immediate southeast and northwest of campus contain clusters of off-campus student residences. However, to access campus from these neighborhoods on foot or bike, students must cross a multi-lane highway in either Braddock Road or Ox Road/Chain Bridge Road. Both of these roads lack adequate bicycle and pedestrian facilities. For example, several students live in the Kings Park West neighborhood, which is accessible from the intersection of Braddock Road and Carriagepark Road. On the north side of Braddock Road at this intersection, a staircase leads up a hill into campus. However, no traffic signal or even a crosswalk provides a safe crossing here. Pedestrians clearly cross Braddock Road here and use this staircase to enter campus, as evidenced by the worn ground on the otherwise grassy Braddock Road median. Moreover, this campus entrance is completely inaccessible to wheelchair users and students with mobility issues. Although

Existing Neighborhood Bicycle Facilities

CONTINUE THE EVOLUTION OF MASON FROM A CAR-ORIENTED,



Roadway Safety Concerns (from survey)

a multi-use path runs along the south side of Braddock Road, it is narrow and in poor condition. Multimodal connections are lacking at other campus access points as well - on the northern end of campus, University Drive lacks a sidewalk on its north side leading up to Ox Road and has no bicycle facilities west of George Mason Boulevard, both of which create a critical gap in infrastructure.

In an online survey, students, faculty, and staff indicated several locations on campus where they felt unsafe due to roadway conditions. Locations most frequently reported as unsafe include the Ox Road/University Drive intersection, several intersections along Braddock Road adjacent to campus, Patriot Circle between Peterson Hall and University Drive, and the intersection of Patriot Circle and Nottoway River Lane. A map of all survey responses is shown in the lower diagram on the adjacent page.

Objectives of this strategy for the master plan include:

- Promote low-carbon transportation to reach sustainability goals
- Create a multimodal network within the campus.
- Reduce the need for parking facilities
- Accommodate students, faculty and staff living in nearby neighborhoods for convenient, safe, and sustainable travel
- Address safety concerns of campus population
- Manage the impact of event traffic to Eagle Bank Arena and CFA and other venues, particularly on weeknights
- its built footprint on campus

• Rework Patriot Circle and its outlet points to accommodate the university expanding

REMOVE MOBILITY BARRIERS ON CAMPUS EDGES

As it currently exists, the Fairfax campus lacks a "front door," or in other words, a grand, inviting entrance to campus that is both visually compelling and easily accessible. Most entrances to campus, particularly along Braddock Road at Sideburn Road and at the intersection of Ox Road and University Drive, indicate the location of campus but offer no sense of place and only minimal multimodal facilities. As a result, despite the abundance of pedestrian paths, crosswalks, and bike lanes along Patriot Circle and in the campus core, traveling on foot or bike between the entrance and core is difficult and potentially dangerous.

Not only are connections missing between campus entrances and inner campus, but they are also missing between the campus and nearby points of interest. As discussed in the first strategy, few high-quality multimodal facilities link the Fairfax campus to student and faculty residences nearby, hindering the university's potential for promoting sustainable travel. It is also inconvenient to travel by foot or bike between campus and other nearby destinations such as the University Mall and Old Town Fairfax. For example, to reach the University Mall, pedestrians must cross six (6) or seven (7) lanes of traffic (depending on the side of the street) on a major arterial road along a 90 or 100-foot crosswalk. Long crossing distances discourage and endanger bicyclists and pedestrians, especially across busy roads. Reaching Old Town Fairfax can also be inconvenient – while there is a multi-use path along George Mason Boulevard, there are no bicycle facilities along Ox Road/Chain Bridge Road north of campus, and the path along Roberts Road

is in poor condition and is not continuous all the way to Old Town. University Drive is narrower and less busy than Braddock Road; however, the bicycle lanes on Aquia Creek Lane dead end at University at a right-in, right-out only with no place for bicycles or pedestrians to cross the street. This lack of through routes for bicyclists cause many to ride through the campus core, causing conflicts with pedestrians.

Objectives of this strategy for the master plan include:

- Improve convenience of access between campus and Old Town and between campus and nearby residential neighborhoods
- Divert bicycle through-traffic away from campus core
- Reduce conflicts between regional vehicular through traffic on Braddock Road and local multimodal traffic to and from campus

DECREASE THE PARKING DEMAND ON CAMPUS PER COMMUTER

The university has plans to expand its academic footprint on campus. Most of the remaining campus land east of Ox Road that is not used for buildings or environmental conservation is currently occupied by parking. Converting these parking lots into garages or building new lots or garages elsewhere is expensive, and the university aims to maximize the space available on the Fairfax campus. Any new parking lots built would be located in West Campus and may be perceived as less desirable since drivers must take a shuttle or ride a bike from the lot to campus. Therefore, it is essential to reduce the demand for parking on campus so that the university may expand with minimal investment in costly new parking facilities.

Several programs at the university serve to encourage students and employees to use the university's transportation network, including parking resources, in the most efficient way. Known as transportation demand management (TDM), these measures aim to shift the university population's transportation needs to times and locations that are not already at capacity as well as to sustainable modes of travel.

The university has been successful with a variety of programs so far. Providing a shuttle system and offering free rides on the CUE bus allow students to live off-campus without needing to drive to class. Full-time faculty and staff are eligible for the Commuter Choice benefits program where they can receive yearly subsidies for taking public transit or bicycling to work. Although the shuttle and CUE systems connect to the Metrorail Orange Line, student/employee Metrorail and Metrobus rides are not directly subsidized by the university. The VRE commuter-rail service could potentially also be expanded to help

reach western commuters.

Several existing incentives also promote bicycling to the campus population. In 2019, the university was recognized as a Bicycle Friendly University, with a silver level distinction for the Fairfax campus and a bronze level distinction for the Arlington campus. The Patriot Bike Check-Out Program provides free one-day bike rentals, and students can purchase Capital Bikeshare memberships at a discounted rate. However, there are no Capital Bikeshare stations within several miles of the Fairfax campus (the city does have near term plans to expand the program). There is a station at the Arlington campus.

Objectives of this strategy for the master plan include:

- Save money by eliminating the need to build expensive garages
- Utilize land currently occupied by surface parking lots for university growth
- Reduce the number of cars on campus and improve safety for all road users • Encourage sustainable modes of transportation

The analysis and strategies introduced above, and described in more detail in the appendix, result in two key ideas for Fairfax. The first is a remained street network that disaggregates Patriot Circle, introduces managed streets, and better addresses key campus gateways.

Existing street system



Proposed street system



The second key idea is to reorganize parking on campus. While the hope is that improved demand management would allow Mason to capitalize on the trend of decreasing per-capita demand (and therefore not need to replace all lost parking, the plan shows capacity to maintain the current parking supply. Approximately 73% of the parking supply could remain on the core campus, with the remainder moving gradually, as needed, to west campus.

Existing parking supply



Main campus – 10,584 West campus – 1,395 Townhouse – 150

12,129 Total –

Proposed parking supply if one-for-one replacement becomes necessary



Main campus –	9,074*
West campus –	3,298
Townhouse –	150

12,372* Total –

* Including approximately 400 underground parking which goes with the residential project

The plan explores ways to improve both the northern and southern gateways to campus. In the north, we introduce a major new drop-off/turnaround loop, relocate the transit hub to help simplify shuttle routes, and discuss strategies for a new managed street. In the south, we introduce a new primary multi-modal gateway at Carriagepark Road. The Sideburn Road becomes a managed entry used for events, and the Roanoke River Road entry focuses on serving nearby retail. The

university should work with Fairfax County and with VDOT to explore possibilities to improve safety for the many students living immediately to the south, and looking to cross Braddock either as pedestrians or on bicycles.

Proposed northern gateway



Proposed southern gateway



The disaggregated Patriot Circle is imagined as an integrated system that could support multiple modes of transportation. The north-south legs remain as major vehicular routes, but now include pedestrian and bike paths, and are integrated with the Necklace. The east-west legs become managed streets with flush pavement conditions, which minimize everyday vehicular traffic and emphasize the pedestrian experience.

Proposed north-south avenues





Specific design elements such as physically separated bike lanes, and striping and markers where space is not available will be looked at as part of a built-work project.



PROPOSED NORTHERN MANAGED STREET

This view looks east on Patriot Circle toward the upper quadrangle. It is a key strategic location for campus arrivals and departures. It accommodates people graciously as a main campus 'front door' with ground floor uses, cafes, and information on campus events, symposia, etc. It would feel primarily like a pedestrian space that accommodates bus and shuttle drop-offs.







PATRIOT CIRCLE- SHARED TRANSIT WAY

This diagram illustrates some of the key aspects of a transit node within a pedestrian environment. A flush plaza-like condition using bollards delineates a safety zone. Elegant shuttle canopies and weather protection complement adjacent building interior uses such as cafe and work spaces. Simple groves of trees help to mitigate summer heat gain on the street and the adjacent buildings. Lighting would complement the urban plaza-like nature of the space.





CAMPUS ENTRY LOOKING SOUTH ALONG GEORGE MASON BOULEVARD

This is one of the main streets connecting the university to downtown Fairfax. Proposed development along university drive in this location should present an active street environment which complements the proposed increased residential uses in the area.



CAMPUS ENTRY LOOKING SOUTH ALONG GEORGE MASON BOULEVARD (NIGHT)

The street ends with an arrival court for cars and buses. Street lighting, street trees and signage should complement this district to campus, keeping it active 24/7.





VIEW LOOKING EAST ALONG UNIVERSITY DRIVE

Proposed residential development and active ground floor uses engage this key entry into the university district. These important perimeter zones should say "welcome" versus a gated, walled perimeter; connecting versus separating Mason from our host communities.







CONNECTION TO WEST CAMPUS- PROPOSED

s idea integrates lighting, bikeways, pedestrain paths and car traffic, and repairs with bold planting of perimeter meadows I tree groves, creating a park like environment.

VA-12



Perimeter landscape treatment B with mobility system

Complete street with sidewalk and bike lane

Enhanced recreation fields



UTILITIES

This utility masterplan report analyzes the utility changes and/or additions required to accommodate new building developments at George Mason University's Fairfax, Science and Technology (SciTech), and Arlington campuses. Please see the appendix for full details.

The study is focused on Fairfax and SciTech campuses as they are the proposed sites for future building development. Development is to consist of residential, academic, mixed-use, and new recreational space. These are represented in the diagrams on the following pages as pink buildings. Development zones are also identified in these diagrams.

The majority of the thinking in this master plan report focuses on approaches to support future development. These ideas will be enhanced and supplemented—particularly with respect to support for existing buildings--by the development of Mason's climate action plan which will further inform choices Mason will have for sewer, water, energy, and telecom infrastructure investment in support of Mason's climate neutrality goal.





Fairfax Campus Development Program

SciTech Campus Development Program

HEATING AND COOLING

Option 1 – Central Utility Plant (CUP) Expansion

For option 1, the current CUP would be expanded to include new boilers and chillers as the current capacity is not sufficient to accommodate all the proposed growth. These technologies are readily available and familiar to the campus, but this option would not be in line with Mason's carbon neutral goals on campus as it would continue to rely on natural gas for heating and hot water. This option would use the existing thermal piping network with the exception of some upgrades to larger sizes in some segments. It would also require new piping distribution to the new buildings. See adjacent diagram for this option layout.



Option 1 Layout (Expansion of Existing System)



Option 2 Layout (Central Ground Source Heat Pumps)

Option 2 – Centralized Ground Source Heat Pumps (GSHP)

Option 2 is to use to geo-exchange technology, using the ground as thermal battery to provide heating and cooling to all new buildings. This option would create a new ground-source heat pump central plant on the west side of campus and another to the south-west. This option would not utilize the existing CUP and its distribution network (except for existing buildings). This approach would mean that all new buildings would be carbon-free when the grid is 100% clean, as it is all-electric with no natural gas burning. The ground-source heat pumps (and any carbon-free heating equipment) would circulate low-temperature hot water. This is different than the current Mason infrastructure which circulates high-temperature hot water using smaller diameter pipes. Therefore, new piping distribution would need to be installed from the CUP to new buildings. The main ground-source heat pumps (housed in the new CUPs) require two large fields of boreholes to transfer the heat.

The study estimates the new CUPs would require approximately 350,000 square feet for boreholes. They can be installed under green or paved surfaces like fields or parking lots but would require specific coordination and design to be installed under buildings. It should also be noted that building future structures on top of the boreholes is not possible except with very lightweight buildings with limited foundations. To optimize the borehole field size (and cost) the CUPs would also have backup electric boilers and water-cooled chillers for the peak condition capacity; we sized the field for 50% of the peak heating load. Ultimately it is recommended that both CUPs are connected via the distribution network to provide redundancy. See adjacent diagram for this option layout.



Proposed Potable Water Improvements at Fairfax Campus (Please refer to the Appendix for details)

POTABLE WATER

Recommendations for Improvements

are required.

The proposed potable water configuration considers relocations and service additions required to accommodate the footprint of new building development and whether the existing network has sufficient capacity to accommodate the proposed growth.

The adjacent diagram illustrates the proposed network, with pipe additions annotated.

The purpose of these improvements is defined as follows:

- development, a new pipeline is shown to maintain the service
- shown to connect this branch to an existing or diverted line.
- provision is currently provided.

To facilitate new building construction, some modifications to the existing water network

• Diversion: Where the existing pipe is in conflict, or likely in conflict, with the proposed

• Close Loop/Resilience: Where an existing branch is observed, a new pipeline is

• New Service: To supply a new building, a new water main is shown where no water

SANITARY SEWER

Recommendations for Improvements

To facilitate new building construction, some modifications to the existing sewer network are required.

The proposed sewer configuration considers relocations and service additions required to accommodate new buildings and whether the existing network has sufficient capacity to accommodate the proposed growth.

The adjacent diagram illustrates the proposed network, with pipe additions annotated.

The purpose of these improvements is defined as follows:

- to satisfy peak demands.
- development, a new pipeline is shown to maintain the service.
- to the network, in the event of a partial failure of the branch line.
- provision is currently located.



Proposed Sanitary Sewer Improvements at Fairfax Campus (Please refer to the Appendix for details)

• Proposed Upgrade: Based upon the findings of this study, an upgrade is recommended

• Diversion: Where the existing pipe is in conflict, or likely in conflict, with the proposed

• Close Loop/Resilience: Where an existing branch is observed, a new pipeline is shown to connect this branch to an existing or diverted line. This is to add resilience

• New Service: To supply a new building, a new sewer is shown where no sewer



TELECOMMUNICATIONS

Recommendations for Improvements

Upsize existing duct banks in orange, leverage planned duct banks in pink and provide new duct banks in cyan to serve proposed new buildings

Proposed Telecommunication Duct Banks at Fairfax Campus



Total Net Present Value (NPV) versus Carbon Emissions



Preliminary Capital Cost Breakdown

Preliminary Annual Cost Breakdown - 2021 Values

PERFORMANCE COMPARISON OF OPTIONS

A high-level costing study was done to compare the capital, annual, and net present value costs for all options. Their carbon emission performance was also compared. See the Appendix for full details. For the cost build-up the following assumptions were made:

- 4% escalation
- Capital costs are hard costs only
- Option 1 includes an estimate of some piping upgrades
- construction

• Option 4 - some ASHP costs are transferred to the building construction, Costs do not include any electrical upgrade costs.

New buildings in the masterplan will likely be constructed over many years, so the new CUPs and piping construction could be split out into separate timeframes. However, we recommend installing the main borehole field(s) in one construction phase to reduce mobilization and labor costs. Costs that could be delayed to future phases include construction of some heat-pumps, hot or chilled water pumps, or distribution piping.

There is potential for the central plant to add redundancy by offsetting the electrical loads with solar power and/or battery backup. We recommend adding rooftop solar to each new building to add to this offset. There is also an option of adding generators to backup all of or portions of the central plant. The backup scenarios would need to be studied to determine the size of generators.

These issues should be further studied in the upcoming Climate Action Plan.

• NPV includes annual O&M, energy, and carbon costs(\$ per ton) over 30 yrs

• Option 2 - the GSHP could change to be 2-pipe system and defer capital to building


LONG-TERM THINKING

The development described above will likely satisfy all campus needs for the life of the master plan. That said, in order to ensure good stewardship, and to guard against limiting opportunities for future generations, we explored long-term options for additional campus development.

It will remain important to preserve academic proximity. We therefore propose an expansion of the academic core in the south of campus, with capacity for an additional 1,000,000 GSF of academic space, in the area currently occupied by EagleBank Arena. This zone could also support an additional 260,000 GSF of retail space.

The athletics district on West Campus would need to expand further west with a replacement 90,000 GSF arena and 170,000 GSF fieldhouse, as well as new fields and courts to accommodate this residential expansion.



ACADEMIC AND RETAIL SCENARIO





PARKING POTENTIAL

LONG-TERM PARKING POTENTIAL

If all this long-term expansion were to take place, and parking demand did not change (note this is an extremely unlikely scenario), a parking garage could be constructed within the residential and mixed-use retail district in the southwest corner of campus. The footprint of the garage would measure 420' x 240' and would allow for 2,000 parking spaces. Construction of this garage should be a last resort, because of the costs involved and the potential for major shifts in future mobility patterns.



SCITECH



ORGANIZING IDEAS

The introduction of the Innovation Town Center will radically alter the nature of the SciTech campus and Prince William county. It is crucial the campus connect to, and integrate with, the Town Center. In fact, instead of prioritizing multiple internally-focused centers of activity, Mason should invite the Town Center onto the Mason Campus and create a new "main street" where campus and innovation combine. This pattern—university on one side, vibrant retail and partnership activity on the other—typifies most great American college towns. The creation and reinforcement of the main street idea is therefore the biggest driver for the SciTech campus.

NATURAL RESOURCES

NATURAL RESOURCES

The waterway running through the center, the stream penetrating the west edge, the abundant wetland, and the large forested patches are unique assets of the SciTech Campus. They provide opportunities for learning, and recreation. Key ideas include:

- Value the wetland and forest at the center of the campus as key assets,
- Respect the 100' buffer for the wetland,
- Protect the forest area,
- Potentially restore the stream at the west edge.



• Respectfully explore learning and research opportunities in the forest and around the wetland, such as trails, learning stations, small outdoor classrooms, etc.,

INNOVATION TOWN CENTER(S) AND THE MAIN STREET



THE MAIN STREET

The developer-led Innovation Town Center and University Village to the west of the campus is planned to be a mixed-use district of residential units, restaurants, offices, and retail space, which will become a destination for students, faculty, staff and community members.

To leverage the partnership with these development projects, and connect the academic activity of the campus to the residential-commercial area in the town centers, we propose two main axes to help create a single unified and vibrant district.

The main north-south axis within the campus boundary starts from the campus entrance, runs in front of the Hylton Performing Arts Center and Beacon Hall, and connects to a new street in the Innovation Town Center. The existing facilities along the street, including the academic buildings, the performance venue, the small restaurants, and the student residential building, show exactly the right pattern of uses, and the framework suggests further reinforcements of the same nature. The framework envisions an improved pedestrian experience, ground floor activities that spill onto the street, a restored stream corridor that weaves into the town center, and a 'main street' with a bustling vibrant atmosphere for students, faculty, and staff. The main street will also improve the arrival experience for the SciTech campus.

The second axis runs east-west and extends into University Village. It will be a pedestrianfriendly street with cafes, restaurants, and retail.

PARKING



THE TRANSPORTATION SYSTEM

Proposed changes to the street system include:

- 1. Connecting to the new streets proposed by the town centers
- half-loop
- planting more street trees)

Potential new buildings on the west part of campus would replace existing parking spaces. These spaces would be relocated to the east and north part of the campus. The framework therefore shows no loss of parking. The diagram opposite shows the potential changes to the parking system. The relocation of parking includes the following considerations:

- Cautiously utilize the space near the natural resources of the campus. For example, the parking and the wetland.
- adequate parking is maintained.
- Explore shared parking solutions with Innovation Town Center.

2. Realigning George Mason Circle to create T-intersections instead of the existing

3. Introducing bike lanes and an improved sidewalk experience (by, for example,

• Strategically save key locations for future academic and student life activities

the parking lot in front of the Freedom Center is reshaped to leave space between

• Respect parking needs for ADA, community member, and others. For example, near the Hylton Performing Arts Center and the Freedom Fitness Center, proximate and

WEST PART OF GEORGE MASON CIR (THE MAIN STREET)

Typical section

EAST PART OF GEORGE MASON CIR Typical section



SCITECH CAMPUS

THE ENTRANCE EXPERIENCE

The framework proposes to bring clarity and energy to the campus entrance. The key move here is the potential creation of a new School of Medicine building right on the corner. This will be further reinforced with the restored stream and the creation of a new main street with retail and ground floor student activities, and partnership activity.



THE ENTRANCE EXPERIENCE (NIGHT)

The new town centers will greatly increase nearby residents, and make a 24/7 sense of vibrancy possible. Another key issue here is to establish clear connections across the stream to highlight the idea of one integrated district.





SCITECH CAMPUS

THE MAIN STREET

Within the campus, the new main street, which has academic and performance uses on one side, and P3 and retail uses on the other, will be critically important. The goal is to make a destination location, both for Mason students and for the broader community.



THE MAIN STREET (NIGHT)

Transparent ground floors with active uses will encourage academic, research, studying, dining, innovation, and social activities to spill out onto the street, and create a lively atmosphere. The main street will be complemented by the restored stream corridor as a major open space.





SCITECH CAMPUS

UTILITIES

Please see the full infrastructure report in the appendix. In addition to the remarks on specific infrastructure components described below, we also note the existing facilities maintenance compound and office trailers are slowly decaying and in a highly visible area of the campus. The university should consider their appropriate relocation.

HEATING AND COOLING

The SciTech campus does not currently have a central utility plant (CUP) and we estimate the new planned buildings will not generate sufficient demand to make a new CUP economically viable. If Mason were to pursue a CUP at the SciTech campus, our energy and cost trends for the Fairfax campus options would be similar. Since there are fewer buildings at SciTech, air-source heat pumps (option 4) would be a favorable solution. They are carbon-free and efficient options for single-building distribution. Each new building would be designed with air-source heat pump plants at the building, likely with some electric boiler backup. They require more space than gas boilers, so the plant space would need to be considered in early design. See adjacent diagram for a proposed layout.



Air Source Heat Pumps at SciTech Campus

POTABLE WATER

Recommendations for Improvements

To facilitate new building construction, some modifications to the existing water network are required.

The proposed potable water configuration considers relocations and service additions required to accommodate the footprint of new building development and whether the existing network has sufficient capacity to accommodate the proposed growth.

The adjacent diagram illustrates the proposed network, with pipe additions annotated.

The purpose of these improvements is defined as follows:

- development, a new pipeline is shown to maintain the service
- to the network, in the event of a partial failure of the branch line
- provision is currently provided.



Proposed Potable Water Improvements at SciTech Campus

• Diversion: Where the existing pipe is in conflict, or likely in conflict, with the proposed

• Close Loop/Resilience: Where an existing branch is observed, a new pipeline is shown to connect this branch to an existing or diverted line. This is to add resilience

• New Service: To supply a new building, a new water main is shown where no water

SANITARY SEWER

Recommendations for Improvements

To facilitate new building construction, some modifications to the existing sewer network are required.

The proposed sewer configuration considers relocations and service additions required to accommodate new buildings and whether the existing network has sufficient capacity to accommodate planned growth.

The adjacent diagram illustrates the proposed network, with pipe additions annotated.

The purpose of these improvements is defined as follows:

- development, a new pipeline is shown to maintain the service.
- provision is nearby



Proposed Sanitary Sewer Improvements at SciTech Campus

• Diversion: Where the existing pipe is in conflict, or likely in conflict, with the proposed

• New Service: To supply a new building, a new sewer is shown where no sewer



TELECOMMUNICATIONS

Recommendations for Improvements

Upsize existing duct banks in orange and leverage planned duct banks in pink to provide new and redundant connections to new buildings.

Proposed Telecommunication Duct Banks at SciTech Campus

THE NEW BUILDINGS



SYNTHESIS

Infill along the proposed main street will help to create a sense of place, and make the main street more vibrant. The Life Science and Engineering Building (LSEB) will be the first building along the new street. A potential new building could house a future School of Medicine, and could define the entrance to the campus at the intersection of University Boulevard and Cannon Creek Lane. The main street is envisaged to have ground floor retail on the town center side, with opportunities for P3 partnerships above, and academic/performance facilities on the campus side. Note a footprint is also shown for one additional academic facility next to the LSEB (although no specific project is planned at this time).

The east part of George Mason Circle should be realigned and improved for a better pedestrian experience. In addition, the paths on campus, including sidewalks, walking paths, trails, boardwalks, and pedestrian bridges, can better connect to form a walking and biking network that blends with the campus' open space and natural resources.



DUMONTJANKS

ARUP E

BIOHABITATS

CANNON DESIGN

GOROVE SLADE

LANDWISE

VISE LEE PA

LEE PARTNERS