Integrated Space Planning For The Academic Health Center

Final Report
March 22, 2017

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Focus Groups

Clinical Regional Network

Clinical Inpatient and Support

Clinical Ambulatory

Research, Experimentalist

Research, Computationalist

Research, Clinical

Animal Research

Research Core Facilities

Educational Programming and Training Facilities

Student Life / Community

Administrative / Faculty Office Space

Data Services / IT and Support Services

Translational and Incubation Space

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Introduction

The University of Virginia Health System is preparing a comprehensive plan to direct space use in the coming decade. This plan is informed by critical strategic initiatives to improve the patient experience, deliver services under population-based care models and reimbursement environment and to raise the prominence of the institution through excellence in patient care, research, and education. The recommendations outlined in this Integrated Space Plan (ISP) are aligned with the Health System's aspirational and transformative vision and its strategies to achieve it. The ISP, when implemented, calls for the reorganization and replacement of specific assets through renovation and new construction to support a tightly integrated, highly efficient and high quality organization. The integrated nature of this planning process is unique among major academic medical centers and will yield multiple benefits to its mission of care, science, and education.

During the last nine months, the ISP has gathered data to analyze the amount and adequacy of Health System space required to meet current and projected needs. The planning team also evaluated the space utilization of clinics, research laboratories, classrooms, and offices throughout the Health System's almost six million square foot portfolio. Extensive conversations with key stakeholders including executive leaders, faculty, administration and staff have helped to align the Health System's aspirational vision and strategic initiatives with the recommended space and capital allocation strategy.

Process

The integrated space planning process represents a unique and first of its kind effort for the University of Virginia Health System. With significant organizational transformation to be supported and savings identified, the ISP will provide a healthy return on investment while setting the stage for a return to national prominence. Over a nine-month process, each of the missions explored the future demands of their own environments and needed change as well as synergies with other Health System elements in order to develop recommendations. The process was facilitated by a consulting team with specific domain expertise in each of the areas being studied:

- Latimer Health Strategies: process leadership and domain integration
- Blue Cottage Consulting: clinical
- CO Architects: education, community/office, and research
- Jacobs Consultancy: research

Figure 1: University of Virginia Medical Grounds

EXECUTIVE SUMMARY

Thirteen task forces comprising internal domain experts convened individually to review data, identify trends and needs, and develop recommendations. A complete list of task force participants may be found in the appendices of this report.

Project management and governance was shared by a hierarchy of executives and staff, which are also identified in the appendices.

Guiding Principles

To optimize the performance of Health System space and to achieve its strategic vision, several guiding principles for reorganizing and managing space were adopted by the project Steering Committee:

1. Support Organizational Transformation

- The ISP must be organized for success in caring for the health of a defined population, matching the right resources with need and location of care. Resources located in the Charlottesville hub will be focused on multidisciplinary delivery of high acuity care.
- Clinical Care will be organized in service lines with well-connected destinations offering comprehensive services and access to all needed diagnostics on demand.
- Themed centers of research will be housed in facilities with the access to world-class resources which support recruiting nationally.

2. Provide Extraordinary Experiences

- For patients: require travel to the minimum of destinations, connected and intuitively navigable across minimized distances, and the amenities to complete the experience.
- For employees: provide a supportive workplace with access to comprehensive resources (as well as amenities and respite) on demand, thereby enabling performance at top of each person's capabilities.
- For learners: construct sufficient unique opportunities and places to learn – individually and in teams – which continue to differentiate University of Virginia's Health Sciences programs.

3. Improve Health System Performance

- Any solution must foster tighter integration measured by joint and/or consolidated resource use (where appropriate), support of other missions in each domain's space, and consideration of impact on each mission when making decisions. This high degree of integration will distinguish UVaHS nationally.
- While space plans cannot completely control financial performance, they go a long way to setting the fixed operating cost of the organization. The ISP will be characterized by achievement of best practice benchmark (or better) throughput and density, and elimination of avoidable duplication and waste.

- Achievement of the vision will be measured to a large extent by the institution's success in better supporting those leaders already in place and in recruiting the finest faculty, staff, and students. Success in recruitment, in turn, hinges on provision of world-class resources and opportunities, uniquely configured in compelling arrangements. UVa needs to offer that which is not available anywhere else.

4. Optimize Investment Value

- The best solution will be the one offering the greatest speed to implementation.
- The best solution will support the intended transformation at the greatest value – not just lowest capital cost but lowest total cost considering both capital and operational components.

Findings

The Integrated Space Planning offers four summary findings:

1. The health system currently occupies an aging set of buildings. Fully one-third of the inventory (roughly 1 million square feet) is at the end of its useful life.

2. Several investments are key in the early years of the plan to address current gridlock and permit subsequent dominoes to fall:

    a. Orthopedics specialty center at Ivy Mountain

    b. Renovations to Pinn Hall and other research assets

3. With investment in the right set of new buildings – ones which support increased space utilization and contemporary operations – the Health System can migrate into a smaller footprint while accommodating planned strategic growth.

4. Renovation of those assets with remaining life completes the transition to an entirely high-performing space platform.

Integrated Space Planning has established a framework and priorities for investment. Individual business plans will follow which align the details of the funding request with projected return.

Medical Center Priorities

Transform care delivery, improve access and patient experiences

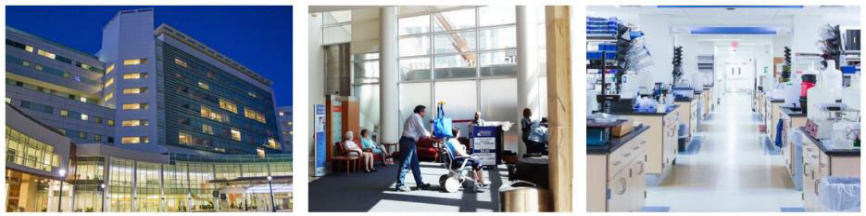


Figure 2: Medical Center objectives

The clinical arm will undergo profound change requiring tight alignment between the Medical Center and UPG. Management will be via the service line structure now being implemented. The hospital will migrate to a much higher acuity environment as its role shifts to that of system hub. Lower acuity patients, with the exception of its downtown Charlottesville 'neighborhood' clientele, will be seen in affiliated systems and closer to home.

Figure 3: Contemporary ambulatory facility examples (Yawkey Center, Massachusetts General Hospital, courtesy Perkins & Will)

Ambulatory care will consolidate into five sites to improve patient experience, access, and multi-specialty delivery. The Battle Building and Couric Cancer Center will continue in their current roles. Orthopedic Sports and Joints programs will occupy a destination Center at the Ivy Mountain site. An on-grounds 'high acuity' ambulatory facility will be developed to serve those patients whose care requires consultation with inpatient-oriented specialists. All other specialists practicing at the system hub will be shifted to near grounds locations:

- Those with close ties to research programs will be consolidated into a single, high performance multispecialty center located at Fontaine Research Park and offering easy access, parking, and ample amenities to support loner multidisciplinary visits.
- Other specialties will be housed in 'consumer-facing' sites located around greater Charlottesville.

The West Complex, JPA MOB, Primary Care Center, Northridge and other fragmented sites will be repurposed away from patient care. Growth at the Charlottesville hub will be limited to 3% (or less, in aggregate) as delivery shifts to a 'population health' paradigm.

Quantitatively, the Medical Center intends to shift roughly one-half of the patient visits now occurring on-grounds, or 200,000 of a total 400,000, to near- and off-grounds sites. This will dramatically improve access, parking, and experience for those remaining on-grounds as well as those moving to new sites.

School of Medicine Priorities

Context and objectives for Medical School investments

- Increase research portfolio to move UVa to a top 25 health system
- Increase contract and grant activity to $250M in five years and $300M within ten years
- Hire and retain highest caliber faculty
- Enable reorganization with emphasis on inter-disciplinary and multi-disciplinary activity
- Invest in medical education environment to continue to attract top candidates
- Address aging infrastructure

Research will grow and transition to a 'themed' environment, with a total incremental increase of $50M in funded research occurring during each of the next two five-year periods (total ten-year incremental increase = $100M within plan horizon). The best quality existing space will be increased in density to better align with the proposed new research environments, such that within five

Clinical Space: Sequence and Timing

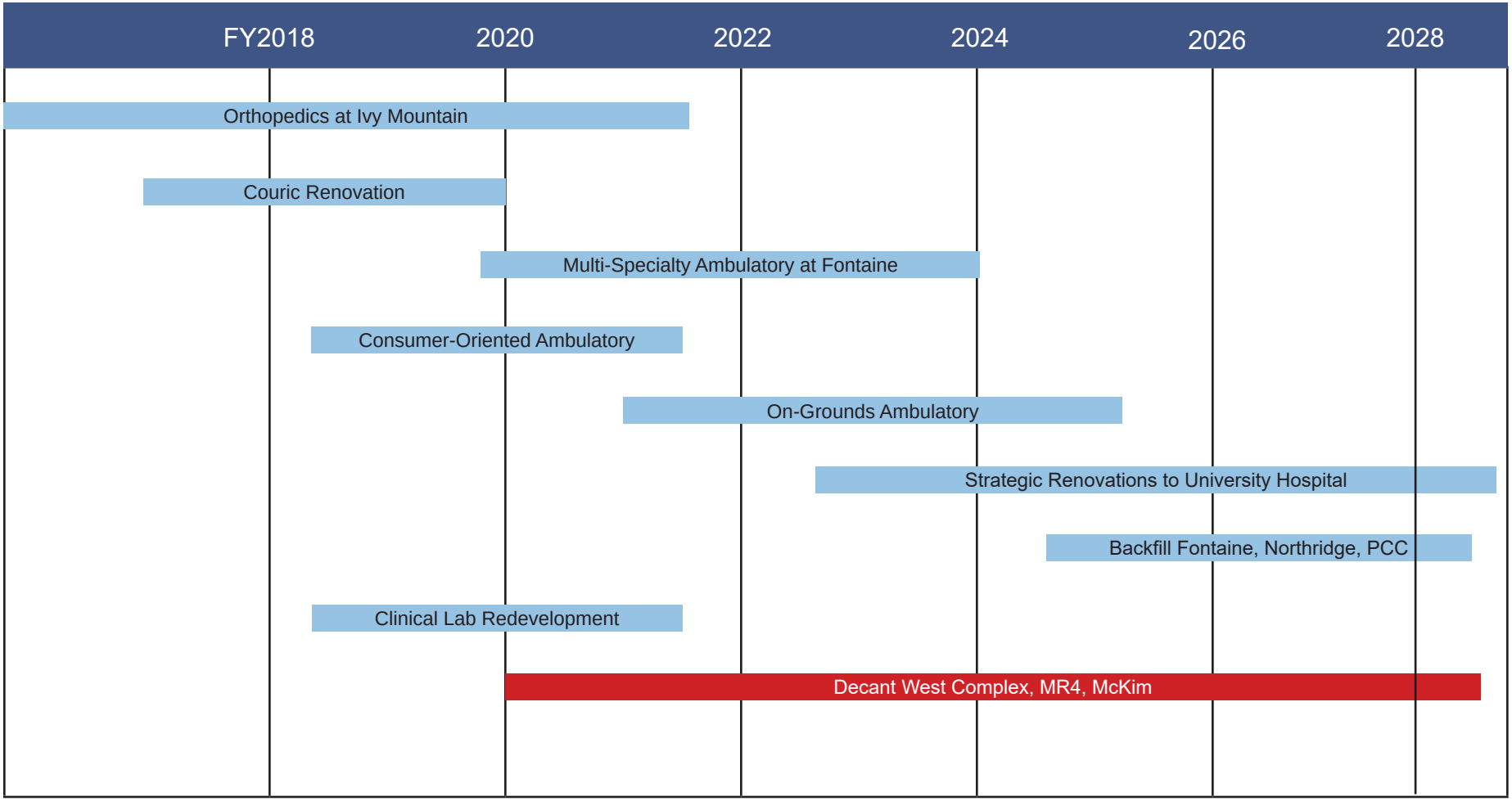


Figure 4: Proposed sequence of Medical Center investments

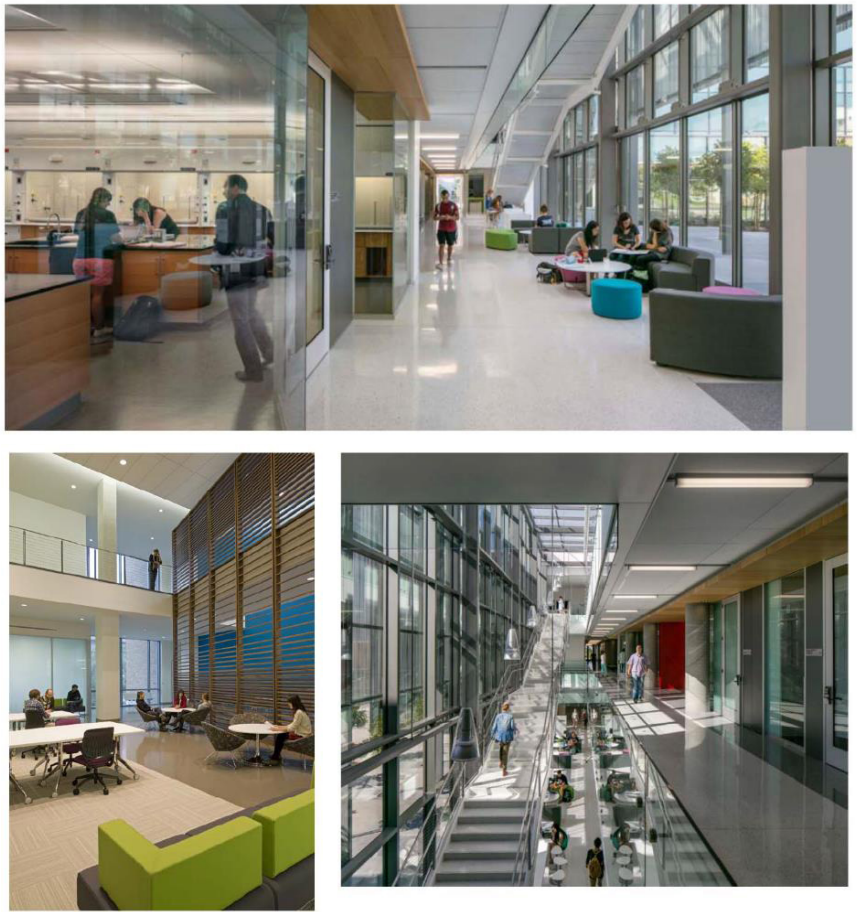


Figure 5: Contemporary research facility examples, courtesy CO Architects

that within five years the entire research arm is housed in high performing facilities. The West Complex, MR-4, and other low performing space will be repurposed, or demolished if no longer able to meet the future needs of the University. Vivaria and research cores will be consolidated in the course of the transition, and interdisciplinary programs, particularly with Engineering and Chemistry, will be enhanced.

Educational domains will continue the transition already underway to new curricula and learning modes. Selected growth in direct program support as well as significant increases in provision of community learning environments is planned. Additional space will be made available for CME and to support trainees in clinical environments. Obsolete auditorium space will be repurposed as community space, where possible.

Shared Resources Priorities

Office space will be transformed to better support the future of work when an area is 'touched' via replacement or renovation. This includes support for mobile staff as well as a greater emphasis on shared environments. The total space occupied by offices will be reduced as duplicate offices are eliminated and spaces are better tailored to the work at-hand. Location will be shifted to better match the site of work as well, with today's 80% on-grounds office environment shifting to a future 66% off-grounds inventory.

Figure 7: Contemporary office environment examples, courtesy CO Architects

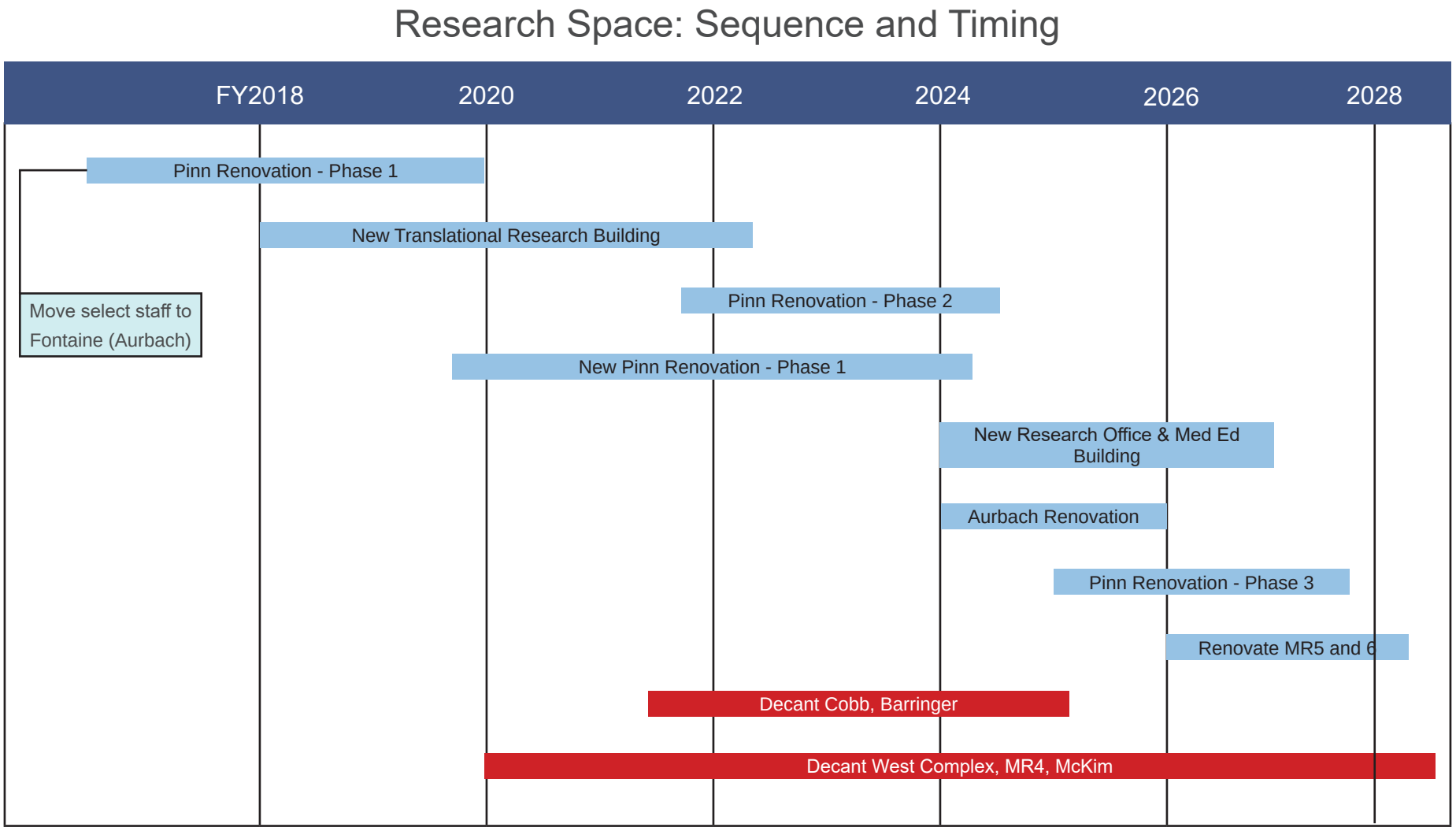


Figure 6: Proposed sequence of School of Medicine investments.

Community space – both indoor and outdoor, will be augmented and enhanced to meet needs for gathering, respite, exercise, and other functions across the Health System. These improvements will be embedded with specific investments with the upshot that each site of care or work will be supported by the appropriate environment and amenities.

Non-performing Assets

As noted, the current Health System portfolio includes roughly one-third space which is at the end of its useful life and in which further investment is not recommended. This represents some 1 million square feet, located primarily in the West Complex, Cobb Hall, McKim Hall, the Jefferson Park Medical Office Building, and MR-4. It is the intent of the Integrated Space Plan to progressively replace these poor performers with new assets, appropriately sized and configured, over the next ten years. When complete, all Health System assets north of Jefferson Park Avenue are available for reassignment with the University system. Buildings within the main Medical Grounds; e.g., MR-4, JPA MOB, Stacy Hall, the Primary Care Center, etc. will be land banked and demolished or temporarily used for office space until transitions are complete.

At conclusion of the plan, the Health System will have migrated to an environment which is high-performing, with 93% of the space suited to its purpose, long-term, 6% in space which can meet future needs with continued investment, and only 1% in space which is not suitable for the long-term.

Summary Recommendations

In order to implement the plan, adoption of five general recommendations for changes in space policy and governance are required:

- Develop and enforce space governance policies.
- Identify opportunities to share space, promote synergies and improve collaboration – continue to move towards a thematic approach in the research enterprise and implement a service line structure for clinical ambulatory care.
- Co-locate core facilities and building amenities (common coffee pot).
- Employ highest and best use strategies for each building.
- Optimize investment value of all capital improvements.

In addition, the ISP outlines a comprehensive ten-year capital plan for the Health System with priority investments for both the School of Medicine and the Medical Center. The initial and most critical investments from this plan are:

- A phased multi -level renovation of Old Pinn Hall. This is viewed as a critical first step to facilitate research team hires prior to realizing a new building.
- A new 250,000 sq. ft. interdisciplinary and translational research building.
- A new market-driven orthopedic center in a highly accessible and patient-friendly location (Ivy Mountain) as well as several additional consumer-focused specialty centers (i.e.,

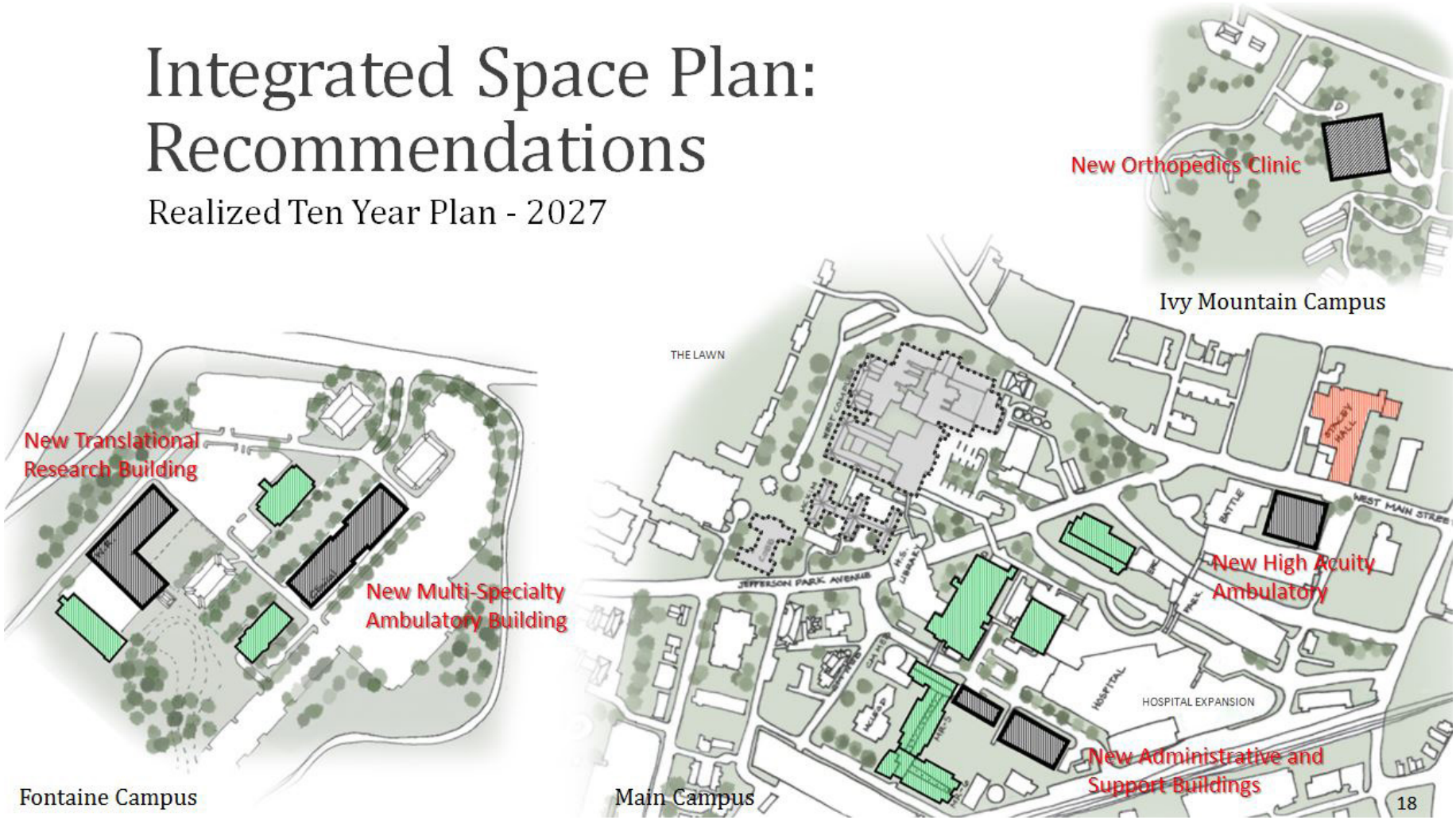


Figure 8: University of Virginia Health System's Integrated Space Planning framework.

Ophthalmology, Surgical Subspecialties) in near grounds locations to be determined.

- A new destination multi-specialty ambulatory care center near grounds (thereby decanting significant on-grounds congestion and parking/traffic demand) in proximity to the research environment

Conclusion

Through the ISP process, it has become evident that over 1/3 of all Health System space and over 1/2 of its research space is past its useful life and can no longer accommodate competitive clinical or research functions, even with renovation. Examples include the West Complex, Cobb Hall, 1222 JPA, MR4, etc. However, it is also true that with strategic investment in renovation, new construction, reorganization, and more efficient use of space the Health System can realize its vision for the future in a smaller overall footprint, while incorporating growth in clinical visits, significant increase in research grant dollars, and enhanced instructional environments and core facilities.

Next Steps

Development of Clinical and Research Program (Capital Projects Planning and Ambulatory Strategy Development):

The Health System needs to move towards a space management structure that enables shared and multidisciplinary use of resources. A new structure would require oversight by an advisory committee of peers, overseen by the Dean and CEO.

The ISP has provided facilitation and the essential analytics to begin this shift.

Governance and Space Management (Data Driven Space Management Process):

Moving to a different paradigm of shared and multi-disciplinary space use can transform the current management structure. A new governance structure is often required.

Financial Modeling:

A feasibility study and business plan will be needed and should include modeling of cost savings due to space and operational efficiencies, i.e. reduction of total square footage, reduction in renovation and deferred maintenance costs, and the potential elimination of duplication of staff.

Physical Planning Next Steps:

To accommodate the physical development identified through the ISP, a series of planning efforts will be required prior to project development.

1. Fontaine Research Park Master Plan
2. Decanting Strategies for the West Complex

MISSION REPORT: CLINICAL

Analysis and Recommendations: Clinical Mission

University of Virginia Medical Center is in the midst of several major transformations, both internal and external:

- Movement to a service line organization (internal)
- Merging ambulatory operations with UPG (internal)
- Engaging the Virginia market with others for delivery of population-based health care (external

Each of these has required the ISP process to develop assumptions related to future operations and resultant space needs in the integrated space plan. These assumptions are documented in the pages which follow.

It is worth noting that – with completion of the East Addition now underway – the Medical Center will no longer have a capacity or space shortfall. It will, however, have a significant operational and vision shortfall. And a large opportunity to deliver better service at lower cost. Transition to a future in which it is consumer-focused and efficiently organized will require investment in new ambulatory space, and the opportunity to right-size the organization's physical footprint and release the West Complex looms large. It must be based, however, on a clear vision of the desired organization and operational paradigm, so there is work on the part of the organization which must precede space planning for phased development of Fontaine. This organizational and operational work must be undertaken with some sense of urgency in order for the needed decisions to be made in time for space planning to start on schedule and the physical transformation to be completed (and objectives secured) within the plan horizon.

Medical Center Projects incorporated in the ISP:

- Completion of East Addition to University Hospital
- Enhanced transit connection between Medical Grounds and Fontaine Research Park (Technology TBD, Complete 2020)
- Emily Couric Cancer Center renovations (4/F fit-out plus 2/F Infusion/ Pharmacy expansion, Complete 2019)
- Orthopedic/Sports Medicine development at Ivy Mountain in connection with Health South redevelopment (Complete 2020)
- Demolition of two buildings at Fontaine to clear site for multispecialty ambulatory center (Complete 2021)
- Multispecialty Ambulatory Center development at Fontaine with required parking and site enhancements (complete 2022)
- Consumer-facing ambulatory development(s) off-grounds (complete 2022)
- First phase decant of West Complex, consolidate in Multistory (complete 2023)
- Demolish JPA MOB (complete 2023)
- On-grounds high acuity ambulatory development on site TBD (complete 2023-4)
- Backfill of PCC, Fontaine buildings formerly housing ambulatory care as on-grounds office space and (potentially) Northridge as off-grounds office space (complete 2025)
- Consideration of expanding the 'Bar' building to house clinical laboratories (complete 2025)
- Ongoing strategic upgrades to University Hospital (TBD)
- Release balance of West Complex and Multistory (complete 2026)

The UVa Health System Overall Vision

The health system will invest to achieve a move into the Top 25 systems nationally. This will manifest differently in each mission, but represents a sea change in each. UVa will be recognized as a tightly integrated, highly efficient and high quality organization in all domains. The ISP will be the physical manifestation of this aspiration, reorganizing or replacing assets as needed to achieve it.

Future of the Clinical Environment

The clinical arm will undergo profound change requiring tight alignment between the Medical Center and UPG. Management will be via the service line structure now being implemented. The hospital will migrate to a much higher acuity environment as its role migrates to that of system hub. Lower acuity patients, with the exception of its downtown Charlottesville 'neighborhood' clientele, will be seen in affiliated systems and closer to home.

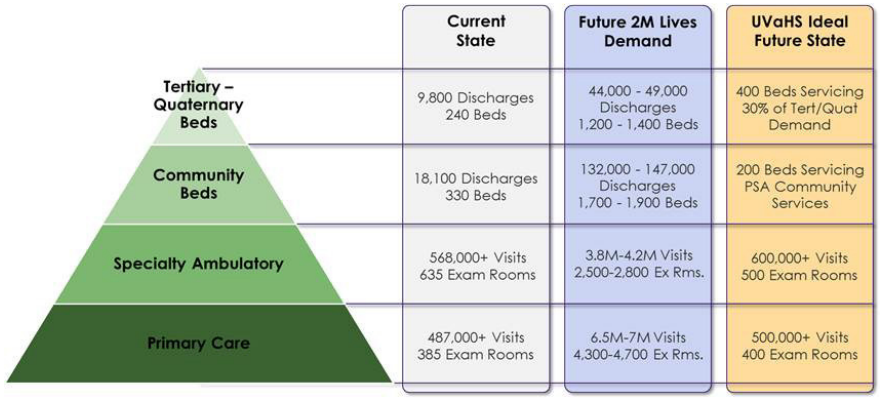
Ambulatory care will consolidate into fewer sites to improve patient experience, access, and multi-specialty delivery. The Battle Building and Couric Cancer Center will continue in their current roles. Orthopedic Sports and Joints programs will occupy a new destination center at 'Ivy Mountain' – the former KCRC site. An on-grounds hub for high acuity ambulatory care delivered by inpatient-oriented specialists will be developed. All other specialists will be consolidated into either a single, high performance multispecialty center located at Fontaine Research Park or in one of a few low-density, consumer oriented sites strategically oriented to key markets. The West Complex, JPA MOB, Northridge, Primary Care Center and other fragmented sites will be repurposed away from patient care. Growth at the Charlottesville hub will be limited and selective as delivery shifts to a 'population health' paradigm.

Clinical Planning Context

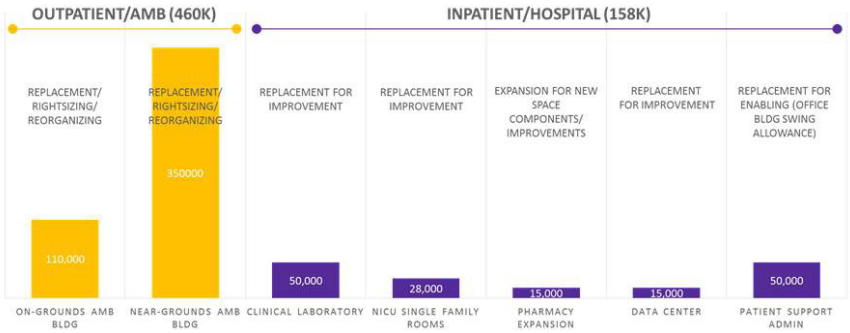
With a system goal of covering two million lives and being the leading provider of Tertiary/Quaternary care, UVaHS will need to redefine how clinical capacities are currently deployed to better serve an aggregately higher acuity patient cohort. In order to do so, UVaHS will need to continue developing partnerships and affiliations to assist in primary and secondary care of two million covered lives market.

Specific Clinical Programmatic Consideration for the Integrated Space Plan

Guided by the preceding vision and coupled with the measure and imagine phases results, the below programmatic components were identified for outpatient and inpatient environments. Program components are shown in GSF. These components are addressed in the overall ISP sequencing, timeline and budget requirements.



UVaHS is addressing immediate inpatient spatial requirements in the east expansion tower. While that project addresses many inpatient concerns, many other considerations were identified in the planning process – these components are identified in purple in the following summary bar chart below and represent about 158,000 GSF.



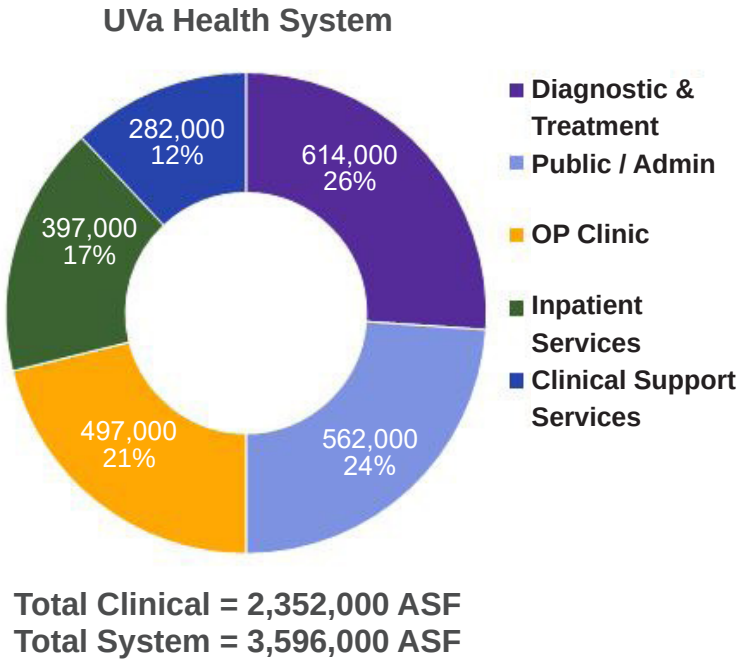
The recommended ambulatory scenario has two+ buildings rooted in a reorganization of ambulatory visits that decants 200,000 visits from on grounds – with near grounds and off grounds receiving 100,000 visits each. One building is recommended on grounds to replace West Complex, JPA MOB, and PCC and one building recommended at Fontaine to address “research-focused” visits with additional near grounds consolidation and strategic placement of square footage to address “consumer-oriented” ambulatory visits. The below chart shows the baseline visits and the growth visits effect on square footage and cost requirements. These components are identified in gold in the following summary bar chart and represent approximately 460,000 GSF. Inpatient and outpatient recommendations have been included into the integrated space plan with moderate priority.

Planning Focus and Process

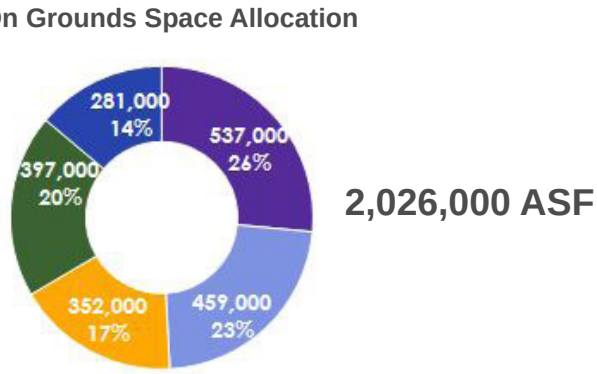
The planning process for the clinical focused portion of the ISP process included seven task force meetings with three task forces (inpatient, ambulatory, and regional network). Input from the task forces was shared with the steering committee and executive committees. The goal of the process was integration and transparency.

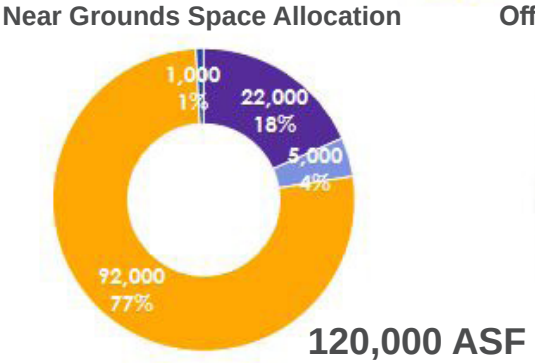
Current Clinical Space: Function Allocation

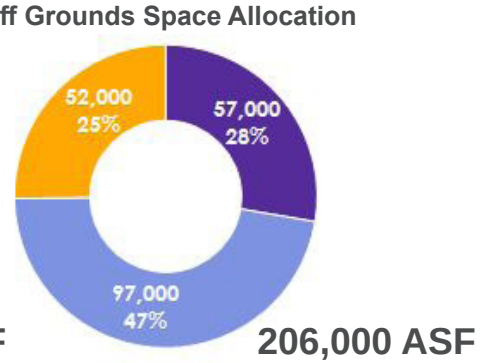
A foundational exercise in the integrated space planning effort was to understand the distribution of space in the health system and the distribution of space in the clinical category. Of the over 3.5M ASF in the system, the clinical category represents approximately 65% of that. The below graphs show the distribution of the total clinical ASF by key functional category and by on-grounds, near-grounds, and off-grounds, with on-grounds representing the lion's share of clinical space.



Total Clinical = 2,352,000 ASF
Total System = 3,596,000 ASF



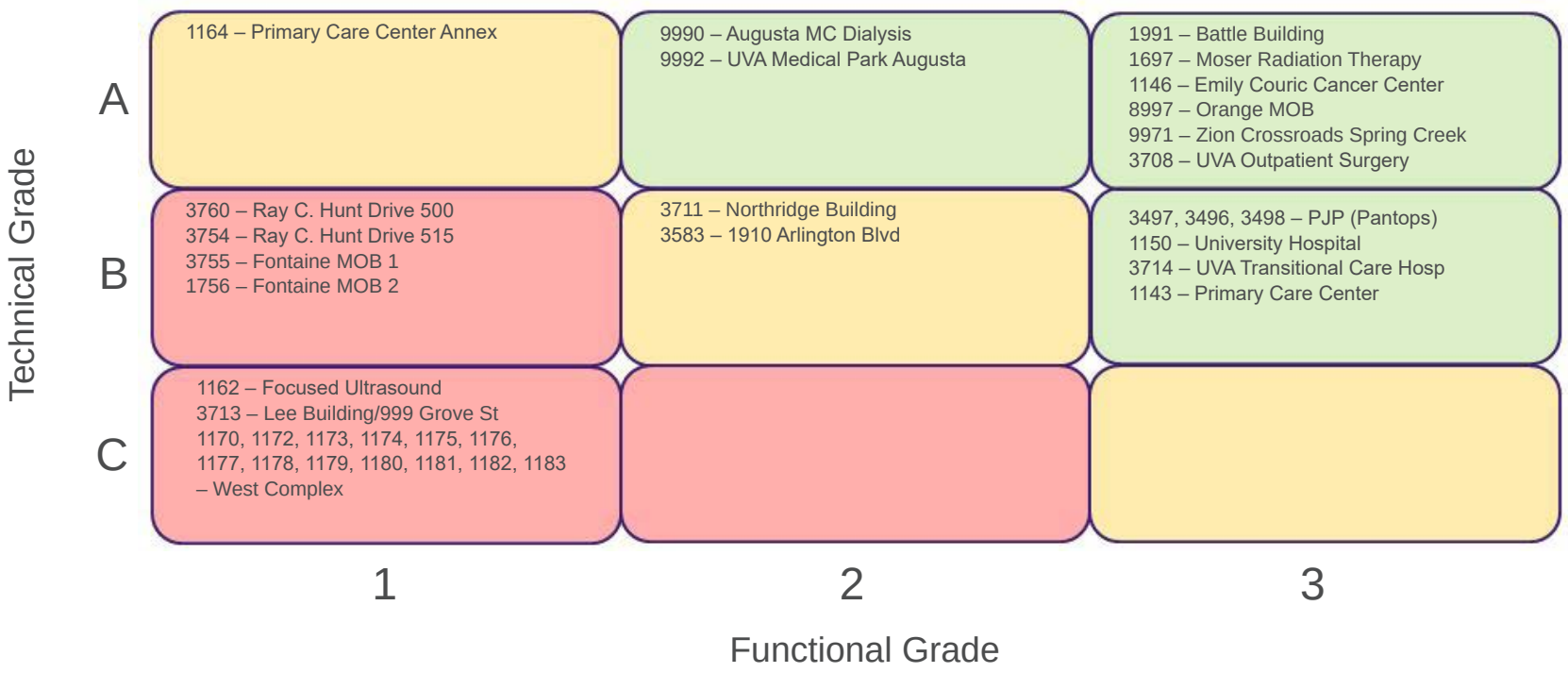




1. Some Off Grounds clinics missing ASF, calc. by 50% of DGSF when available, otherwise excluded

Current Clinical Space: Performance Summary

In addition to understanding spatial inventory and distribution, space performance is a key consideration. The below chart expresses the performance rating of all major clinical buildings. Ratings were based in both a technical grade (building performance) and functional grade (planning performance); red zones represents buildings with poor performance in both categories and vice-versa for the green zones. University Hospital and several on-grounds buildings were rated in the green zone, with the exception of West Complex in the red zone. The red zone also includes several buildings at Fontaine.



1. There are 135 addresses in the UVaHS building portfolio, 60 of which were graded in the above methodology because they were considered key to this engagement.

2. Of the 60, 37 were functionally graded in the clinical category.

Current Clinical Space: Performance Summary

The preceding chart on spatial performance is rooted in the following parameters for technical and functional. Technical parameters are focused on age, deferred maintenance, code, and condition. Functional parameters considered access/wayfinding, configuration, square footage appropriateness, and departmental adjacencies.

Technical Grade

Technical A Grade	Technical B Grade	Technical C Grade
Facility age less than 15 years	Facility age 15-25 years	Facility age 25-40+ years
Little or no apparent deferred maintenance	Some apparent deferred maintenance	Significant apparent deferred maintenance
No significant building code compliance concerns (i.e. IBC, NFPA, etc.)	Possible building code compliance concerns (i.e. IBC, NFPA, etc.)	Building code compliance concerns (i.e. IBC, NFPA, etc.)
Finishes, equipment, and furnishings in good condition	Finishes, equipment, and furnishings in fair conditions	Finishes, equipment, and furnishings in poor conditions

Functional Grade

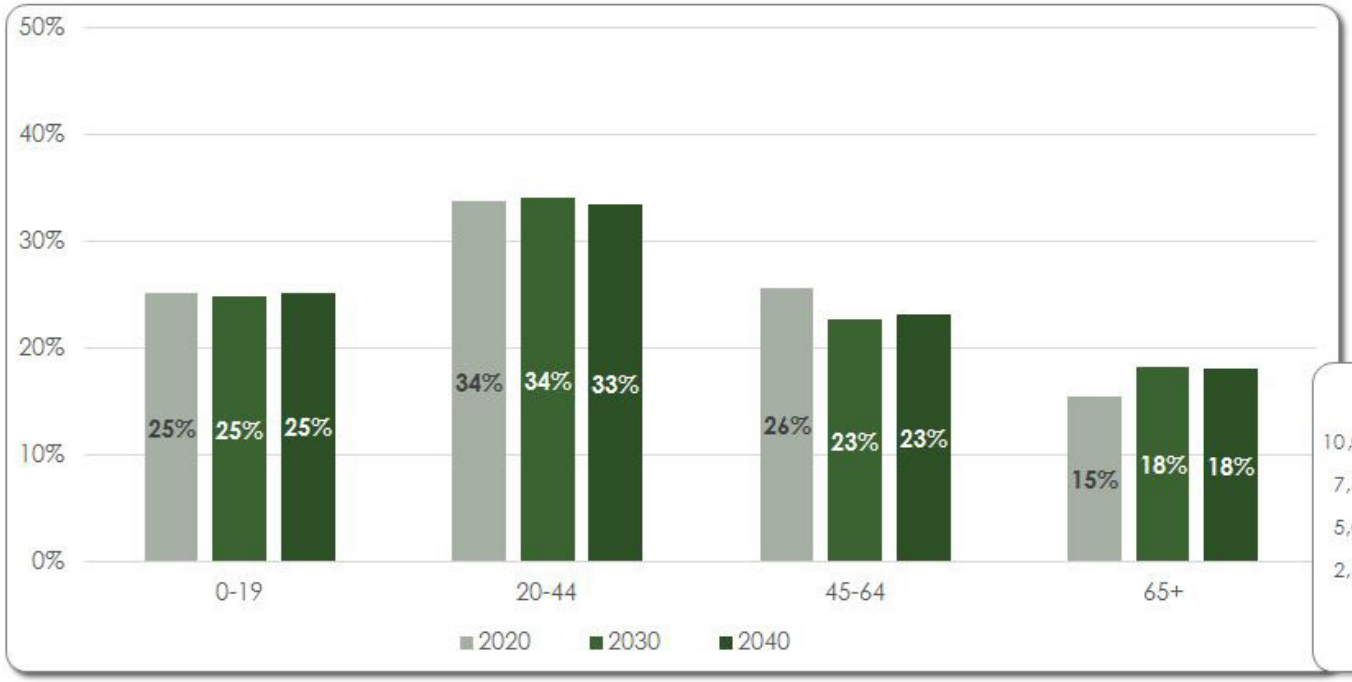
Functional 1 Grade	Functional 2 Grade	Functional 3 Grade
Access and wayfinding excellent	Access and wayfinding sufficient, but needs improvement	Access and wayfinding insufficient
Departmental configurations support efficient operations	Departmental configurations sufficient for operations, but need improvement	Departmental configurations insufficient for operations
Quality and quantity of SF ideal for current functions	Quality and quantity of SF less than ideal for current functions	Quality and quantity of SF poor for current functions
Key departmental adjacencies achieved	Some key departmental adjacencies achieved	Few key adjacencies achieved

Virginia Population: Growth & Aging Demographics

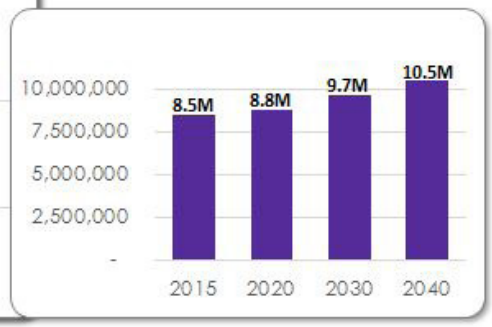
Moderate population growth is projected across Virginia in aggregate, 15-year 0.87% CAGR or +760,000 people. The 65+ age cohort will grow the fastest, gaining +300,000 population over the next ten years. Following this growth, Virginia's aging paradigm begins to plateau following 2030.

Source: Coopercenter.org 2015 Population

State Projected Population Amongst Age Cohorts



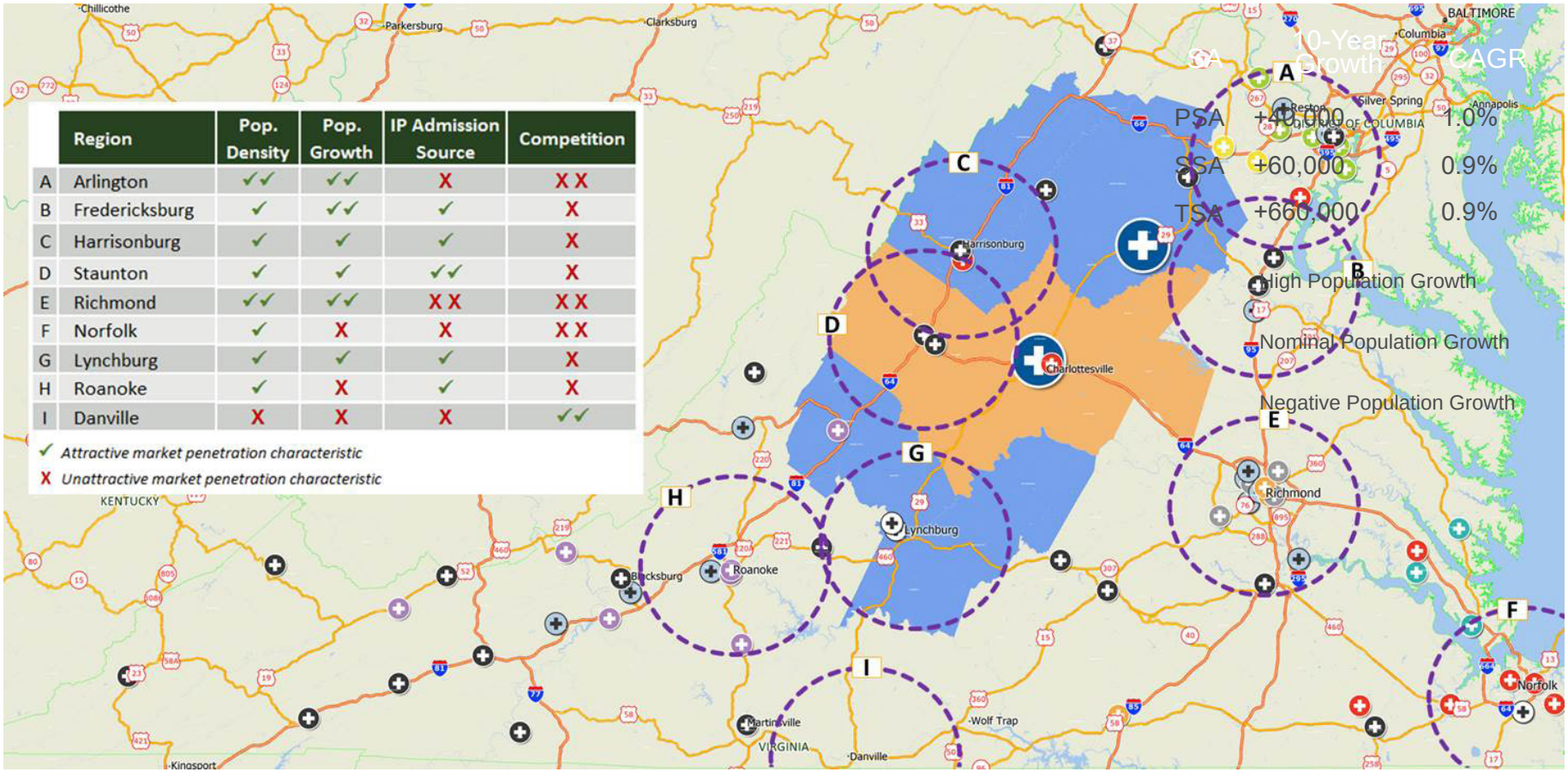
State Population Growth



Virginia Population: Where Will Population Growth Occur?

Suburbs of DC and Richmond account for 70% of statewide population growth over the 10-year forecast horizon while southern rural areas are projected to experience population decline/nominal growth. The immediate service area surrounding Charlottesville (also known as UVaHS Primary Service Area) is projected to experience a faster rate of growth when compared to other UVaHS service areas.

Source: Coopercenter.org 2015 Population



Network Development: Population Access

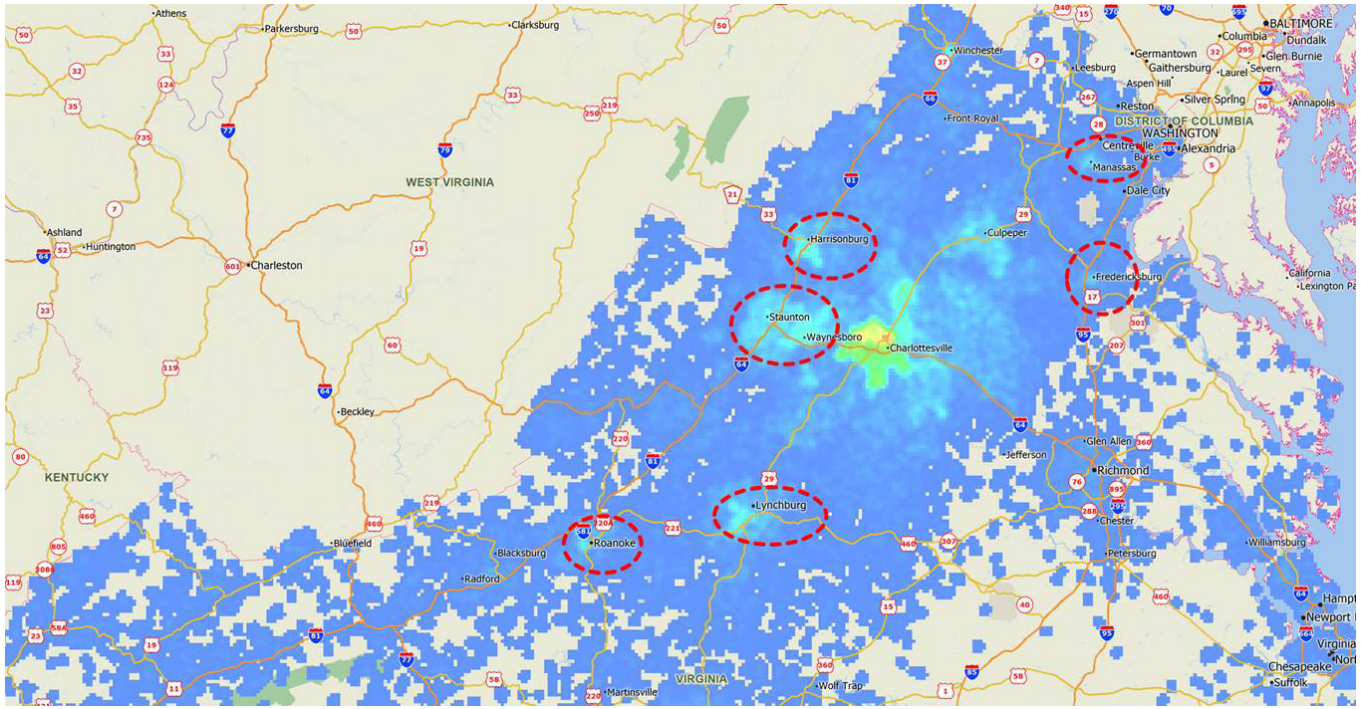
Charlottesville is surrounded by areas of less dense population, however it is closely located in proximity (45 miles East) to the centralized statewide center of gravity when accounting the total population's weighted drive time across the state of Virginia. Currently, 22% of UVaHS inpatient admissions originate from tertiary service areas within Virginia; this is a natural advantage that will assist in enhancing patient accessibility in future network expansions.

Source: 2015 Census and Community Report estimates, population per squared mile; FY2015 UVaHS Inpatient Encounter Report, Finance

Network Development| UVaHS Inpatient Origin

Outside of Charlottesville, multiple ‘pockets’ of higher density inpatient origin areas can be targeted in a future network design; either to continue capturing market share or enhance population health management initiatives. As seen below, UVaHS provides inpatient services to patients all across the state of Virginia as well as over 1,500 admissions (5% of total admissions) from patients originating outside of Virginia.

Source: UVaHS FY2015 IP encounters, excluding normal newborn admissions



Low Density of IP Admissions

High Density of IP Admissions

Higher Densityi Area of IP Admissions

**excludes immediate Charlottesville area*

Network Development: Overview of Region

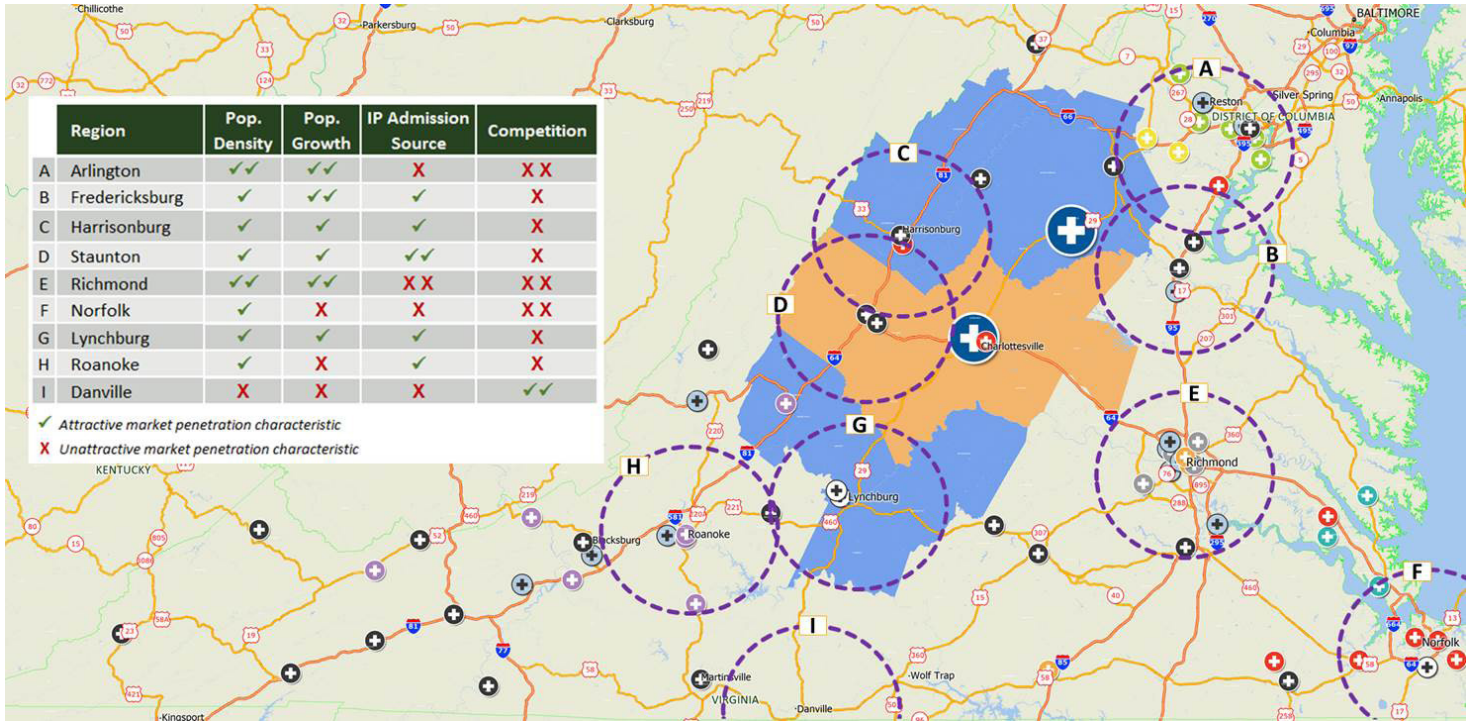
When compiling the prior demographic assessments (density, growth, aging, market share, etc.), similarities and trends can be identified and assist in guiding UVaHS to identify which markets are more favorable than others for future expansion and partnership/affiliation. Here for example, Arlington and Richmond markets offer heavy population density and projected growth, however they are both highly competitive markets. Fredericksburg on the other hand, appears to be more favorable with a moderately dense population and projected growth with less competition.

Source: AHA 2015 hospital locations and systems, FY2015 UVaHS Inpatient encounters, UVaHS Strategic Planning, 2015 Census and Community Report estimates, population per squared mile

	Region	Pop. Density	Pop. Growth	IP Admission Source	Competition
A	Arlington	✓✓	✓✓	X	X X
B	Fredericksburg	✓	✓✓	✓	X
C	Harrisonburg	✓	✓	✓	X
D	Staunton	✓	✓	✓✓	X
E	Richmond	✓✓	✓✓	X X	X X
F	Norfolk	✓	X	X	X X
G	Lynchburg	✓	✓	✓	X
H	Roanoke	✓	X	✓	X
I	Danville	X	X	X	✓✓

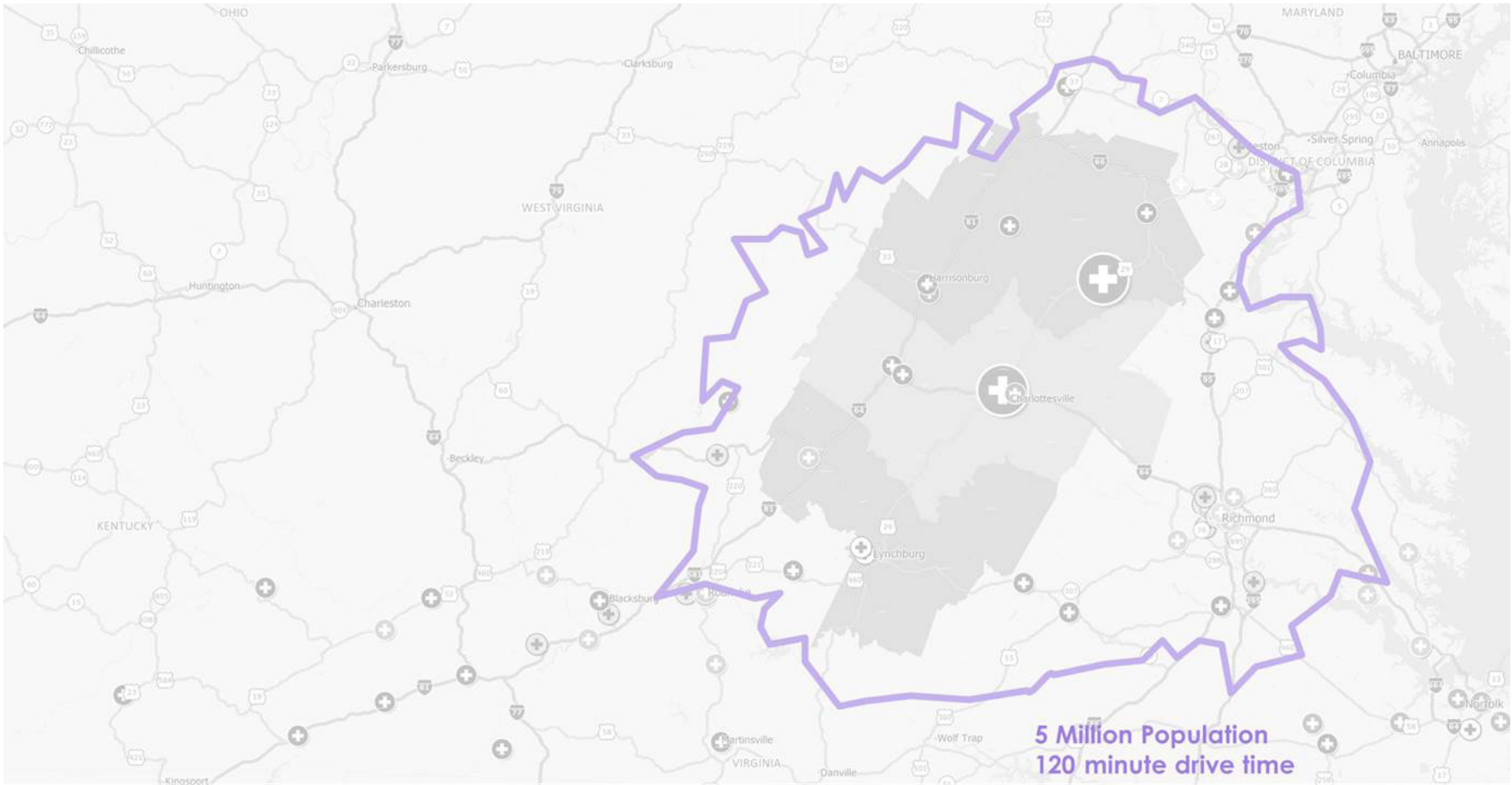
✓ *Attractive market penetration characteristic*

X *Unattractive market penetration characteristic*



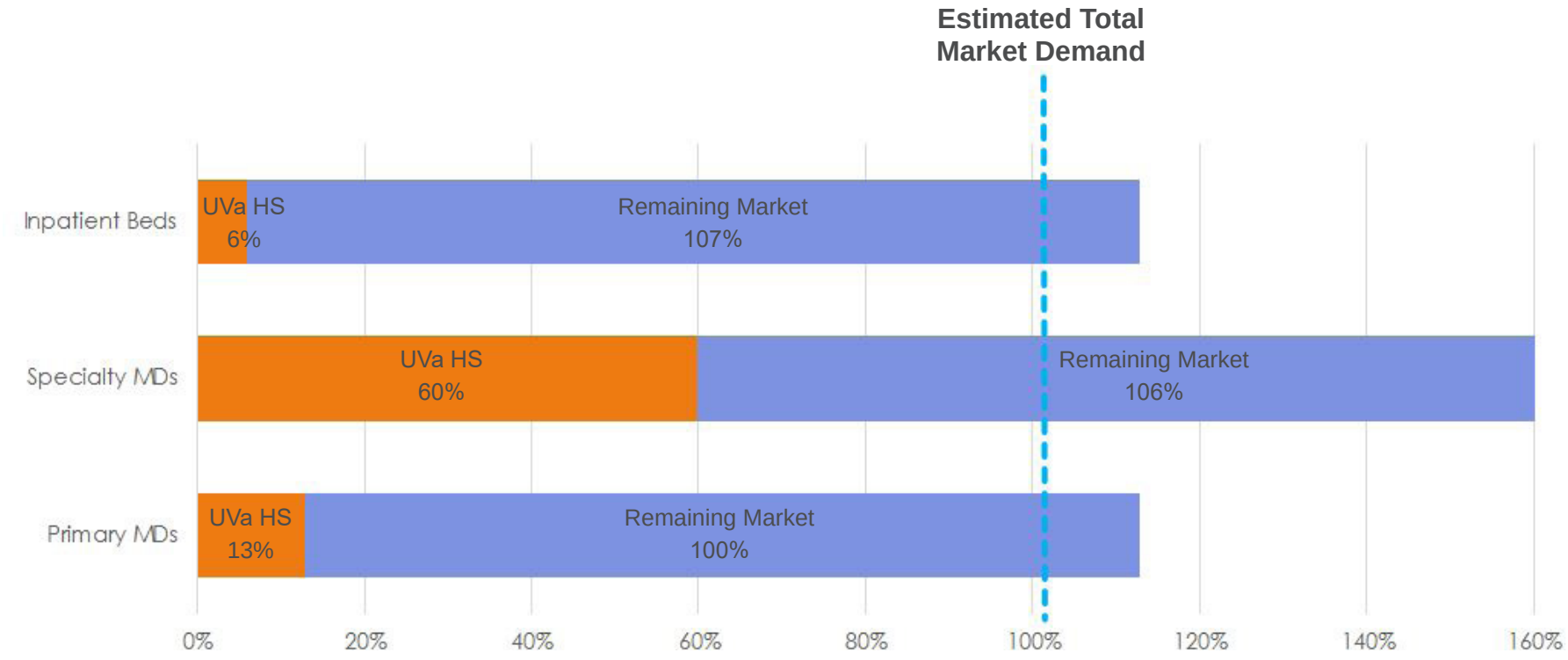
Population Coverage| 5 Million Reach

Historically, UVaHS has defined their market by surrounding Primary and Secondary Service Areas. To expand network considerations, proceeding assessments will broaden the service area to a reach of 5M population, assuming a cohort of 2M population will rely on UVaHS network for clinical coverage. Below is an initial drive time map identifying a 'reach' of 5M population; depending on network partnerships and affiliations, the actual area of 'lives covered' could favor target areas of the state (e.g. D.C. Suburbs, Richmond, Southwest, etc.).



UVa Health System Supply v. Demand: 2 Million Lives

As UVaHS explores a new paradigm of 'lives covered', macro market assessments were completed to determine the current supply and demand of hospital beds and physicians (by primary and specialty care). As modeled below, current supply of beds and physicians meet the assumed future demand of the 2M lives market; however, UVaHS role may evolve over time. For example, UVaHS may continue to be the leading provider in high acuity/specialty services while relying on partnerships and affiliations to provide primary care.

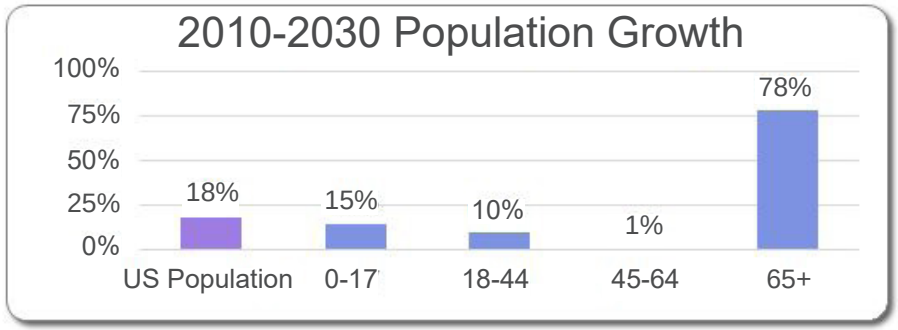


1. Future market considerations are defined as a reach of 5M population generating a UVaHS covered/at-risk cohort of 2M; here, demand is driven by the total 2M market population, or 120 min drive time around UVaHS Hospital, UPG figures not included for physician counts, data pending

Key Findings: National Demographic

National and state level trends were analyzed to determine the future bed needs for the state of Virginia and how this may impact UVaHS planning efforts. As UVaHS service areas are projected to experience moderate population growth, the 65+ age cohort is assumed to growth the fastest.

- 65+ age cohort growing **four times faster** than the US overall
- Next fastest growing age cohort is 0-17, growing at **15%**, indicating future shift of growth bubble to the younger demographic.

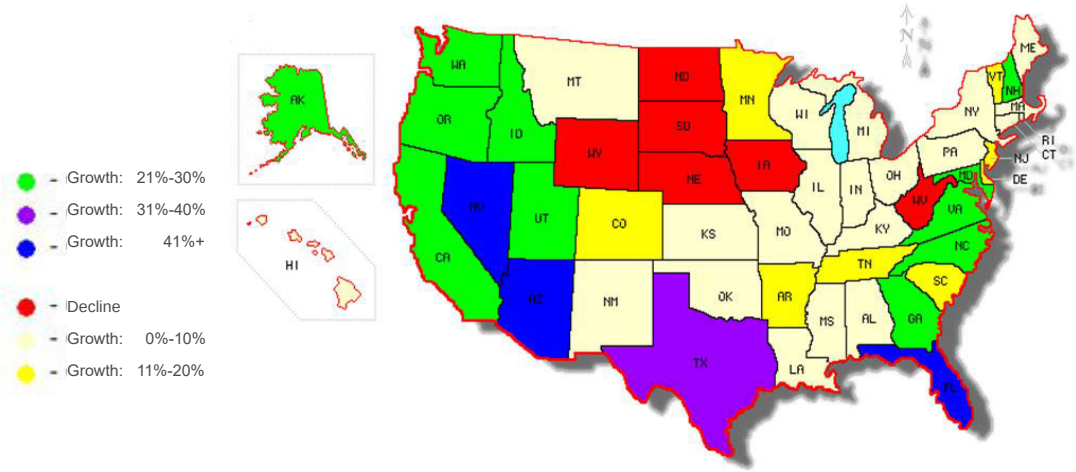


Percentage growth:

- Top 5 states: AZ, NV, FL, TX, WA
- Bottom 5 states: D.C., ND, WY, WV, IA

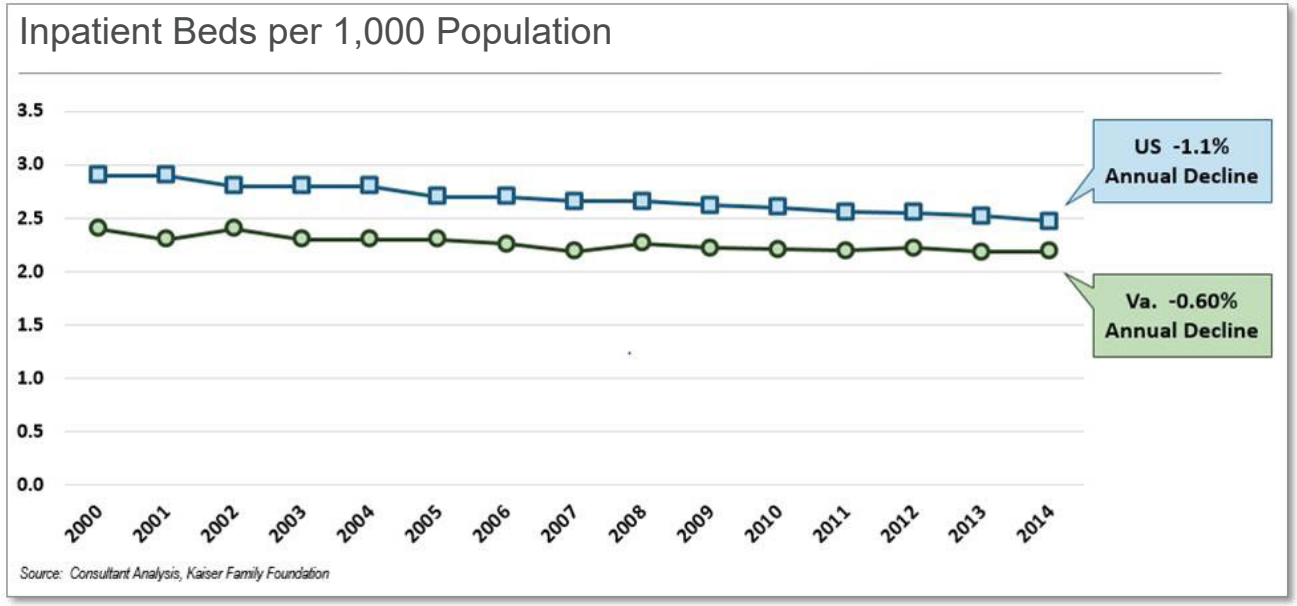
Absolute growth:

- Top 5 states: FL, CA, TX, AZ, NC
- Bottom 5 states: D.C., WV, IA, ND, WY



Key Findings: Virginia

Historical trends of inpatient utilization (admissions per 1,000 population) were compared at state and national levels. Model inputs to determine future bed demand look to sensitivity test the aging population paradigm as well as assuming continued enhancements to how care is delivered.



- Population is expected to grow +760,000 over the next 10 years, mostly focused to the suburbs of D.C. and Richmond
- The 65+ age cohort is growing the fastest at 3x the rate of other age cohorts
- Inpatient beds per 1,000 population have decreased (0.60%) annually since 2000, with currently ~17,000 staffed beds
- Over 720,000 inpatient admissions occurred in FY2015 statewide (VA origin only, _40,000 OOS)
- Inpatient admissions per 1,000 population has historically declined by (0.90%) annually

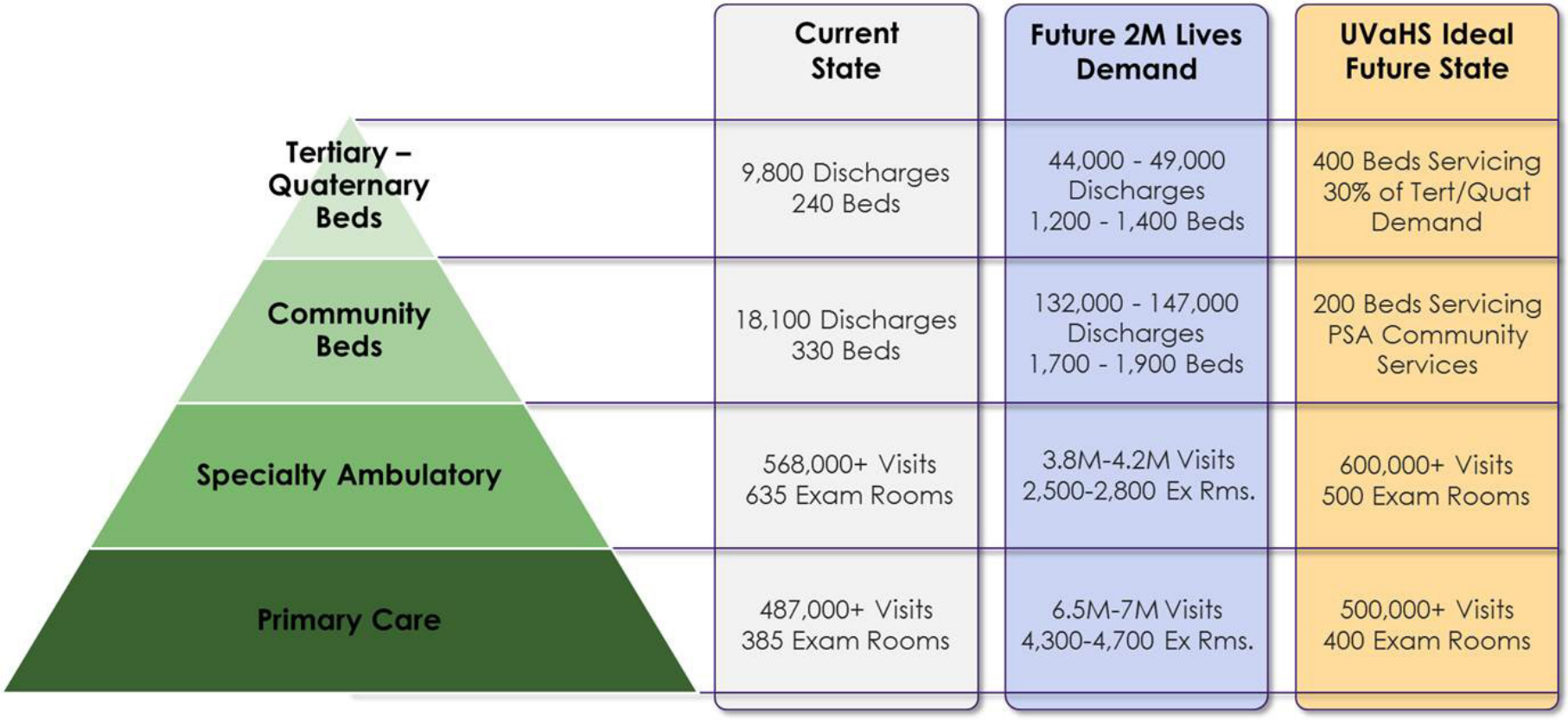
Key Factors Impacting Future System Space

The various categories of clinical space will be impacted in the future by key considerations in difference ways. Below summarizes those key considerations and there potential impact to "net SF per covered life." Overall the effect of SF per covered life should be maintained or reduced in the future.

	Care Model Sites of care, distribution	**Demo Shifts** Aging, migration	**New Business** Strategies, geographies	**Comp Landscape** Competitor moves, risk	**Legislation Impact** ACA future	**Tech Impact** E-health, etc.	**Net Impact** SF Per covered life
Hospital	- Decrease admits/life - Improve throughput	- Increase in aging, but shifting of population	- Increase of non-hospital markets - Partnering	- Increase throughput	- Increase capacity available - Increase centralization	- Increase remote monitoring - E-visits	↓
Medical Office Buildings	- Increase in providers - Improve throughput	- Increase in covered lives - Increase in visits	- New markets require ramp up	- Increase throughput	- Increase centralization	- Increase remote monitoring - E-visits	↔
Administrative	- Redistribution of work - Leverage technology	- Increase in covered lives - Leverage technology	- Leverage industry standards - Leverage scale	- Leverage scale	- New regulations cause administrative burden	- Improved use of technology	↓

Future Care Paradigm

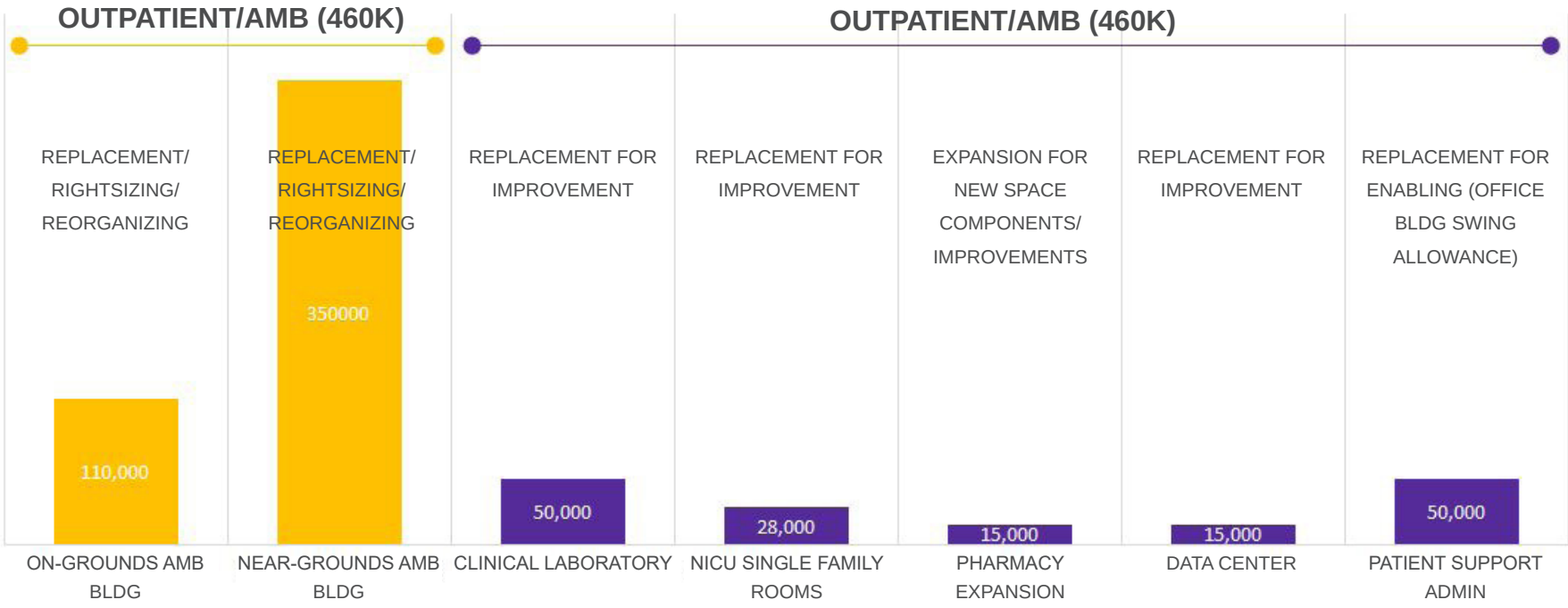
With a system goal of covering 2M lives and being the leading provider of Tertiary/Quaternary care, UVaHS will need to redefine how clinical capacities are currently deployed to better serve an aggregately higher acuity patient cohort. In order to do so, UVaHS will need to continue developing partnerships and affiliations to assist in primary and secondary care of 2M covered lives market.



1. Assessment completed through classification of state-wide admission market data and applying H, M, L acuity classification. Ambulatory visits are not based on UVaHS location geography but by physician specialty.

Scenario Development: Clinical Program Priorities (DGSF or BGSF)

The recommended clinical programmatic summary is below. These recommended program component needs are founded in the evaluation of the current organization and performance of existing clinical space as well as the future direction of the health system. The following chapters (inpatient and ambulatory/ regional) give greater detail on the basis of the recommendations.

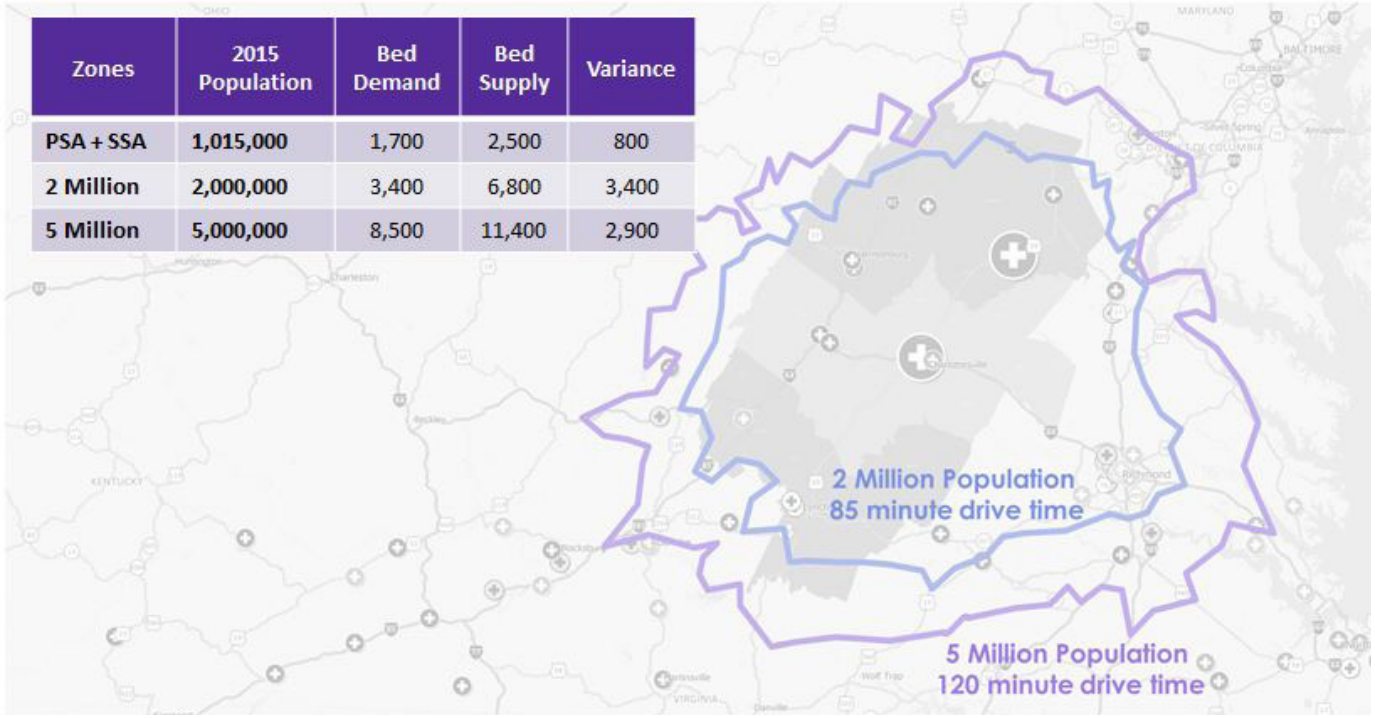


Population Coverage & Inpatient Bed Supply

As an official 2M covered lives market is still under development, initial estimates looked to model 'drive time' estimates around UVaHS to determine the 'stretch' in order to reach 2M and 5M population cohorts. Here, bed demand and supply estimates are determined to show aggregate bed supply exceeds current patient demand.

Source: Bed supply based on staffed bed counts 2015 www.ahd.com

Zones	2015 Population	Bed Demand	Bed Supply	Variance
PSA + SSA	1,015,000	1,700	2,500	800
2 Million	2,000,000	3,400	6,800	3,400
5 Million	5,000,000	8,500	11,400	2,900



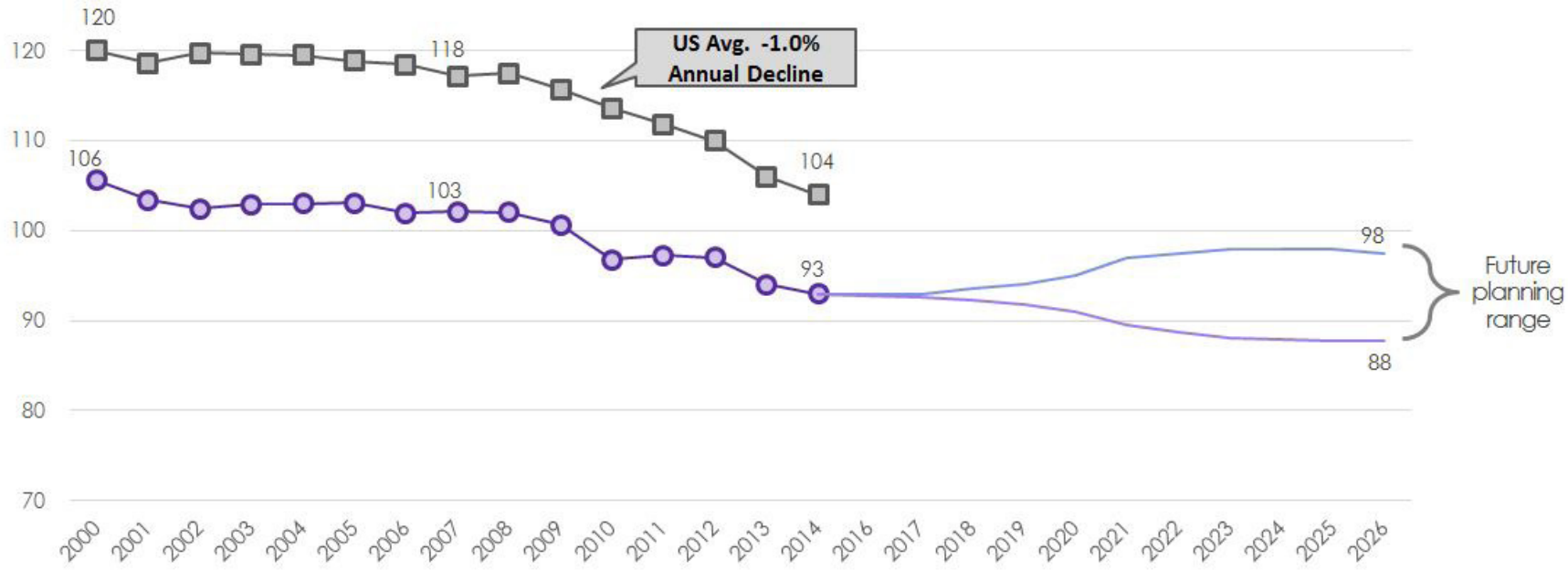
Values inclusive of each layer, not incremental.

Demand based on state inpatient utilization (93 per 1,000 population), ALOS (5.01 days), and 75% bed occupancy rate, excludes LTACH, VA, and Behavioral Health sites

Projecting Statewide Inpatient Utilization: Admissions per 1,000 Population

Utilization rates are one of the levers that was tested to determine the patient demand across a 2M covered lives market. Here, sensitivity testing across the 10-year forecast horizon generates a variance of 10 admissions per 1,000 population. This would later feed into ALOS assumptions and critical care vs. acute bed demand.

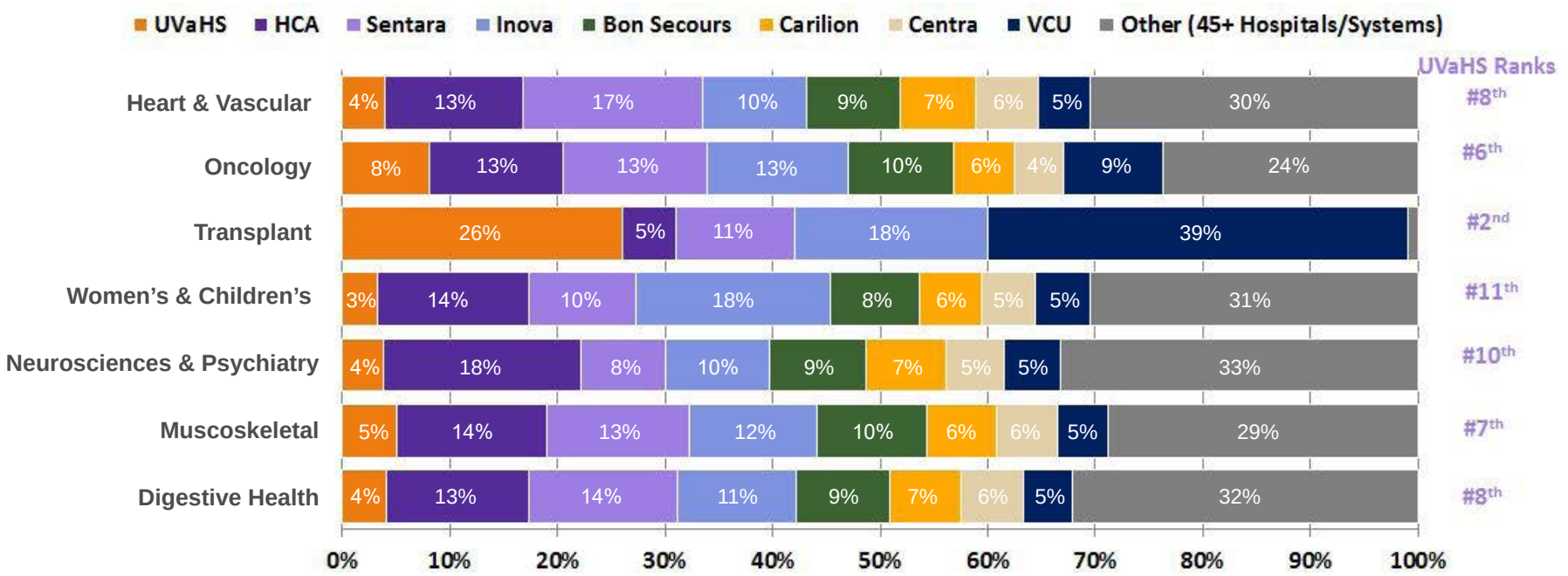
Source: Kaiser Family Foundation State Health Facts, Inpatient Utilization



Virginia Inpatient System Market Share

As UVaHS explores alternative partnerships and affiliations, key service lines were analyzed by market share by Health System to better understand current market dynamics and scope/scale of competing programs.

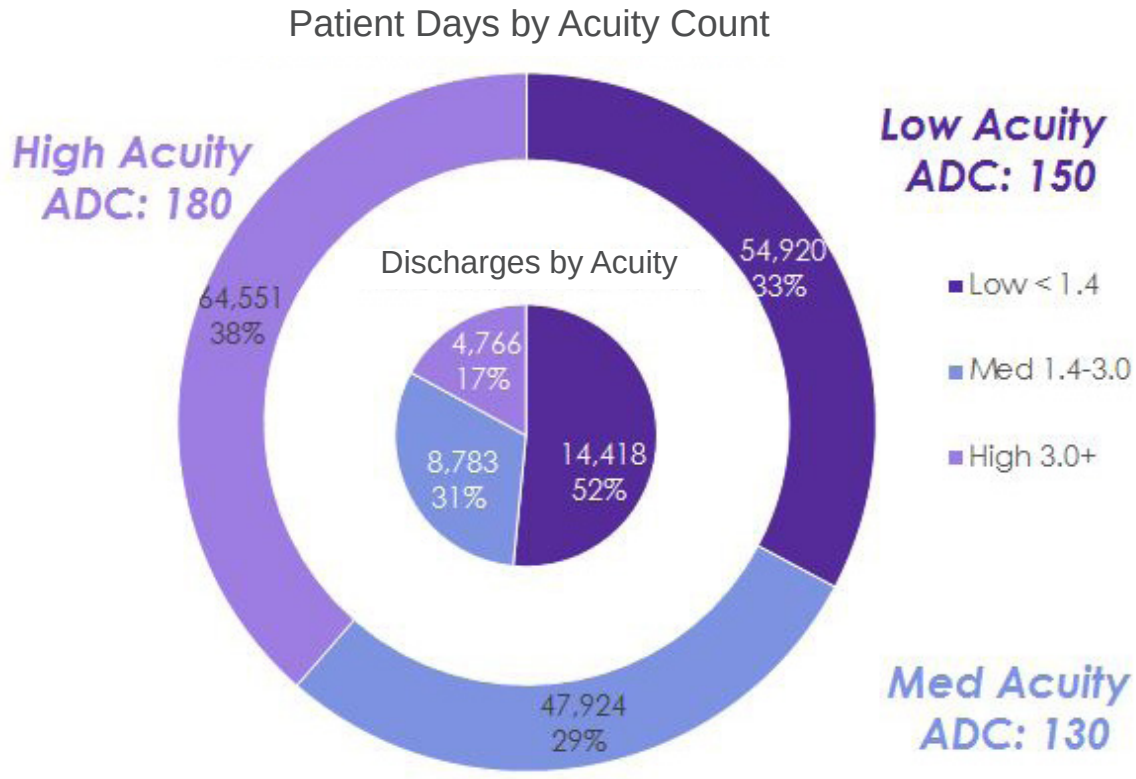
Source: UVaHS Virginia market admissions FY2015



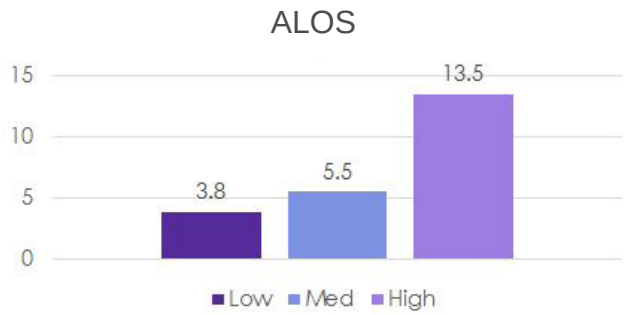
1. FY2015 state data, excludes normal newborns (DRG 792-795), includes admissions for patients within PSA, SSA, TSA. Transplant SL inclusive of DRG's associated with 'whole organ' transplants, excludes BMT

FY2015 UVaHS Hospital Acuity

As UVaHS further defines their role within the 2M covered lives market as a leader in providing tertiary/quaternary services, future bed demand will evolve to care for a higher acuity patient cohort. Here, ranges of Low, Med, and High acuity cohorts are displayed to show the level of admissions, patient days and average daily census.



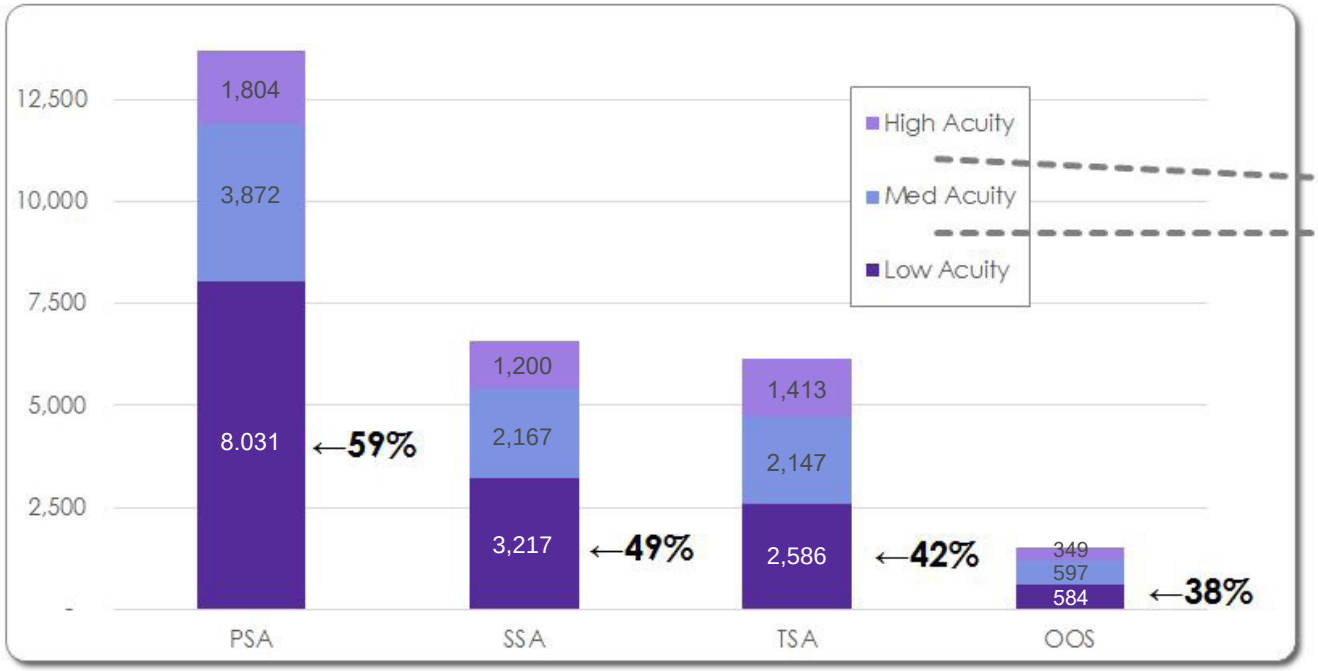
Low acuity admissions account for more than half of total UVaHS admissions, future strategic initiatives need to consider the impact of growing high acuity/quaternary services that would likely align with a 2x-3x ALOS when compared to the Low acuity cohort.



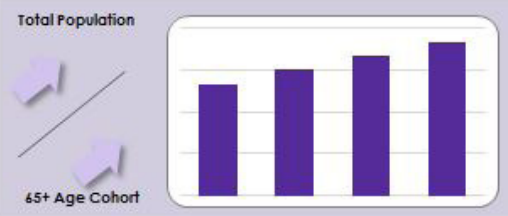
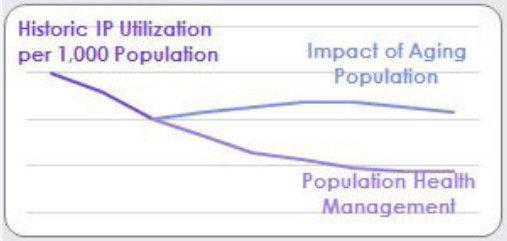
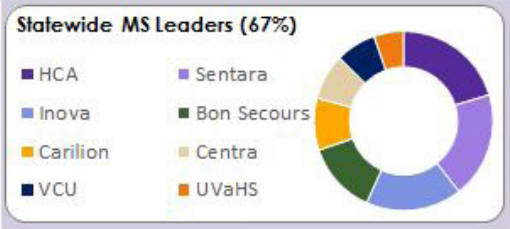
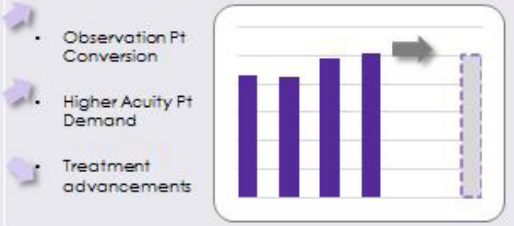
1. Excludes normal newborns, SSU, PPU encounters; Acuity based on CMI DRG weight

Inpatient Admissions by Service and Acuity

Further investigating levels of patient activity by origin, UVaHS will likely continue providing primary care services to its patient population within the primary service area. However, low acuity patient activity migrating from SSA, TSA and OOS service areas will likely shift as primary care services could be provided by UVaHS partnerships and affiliations.

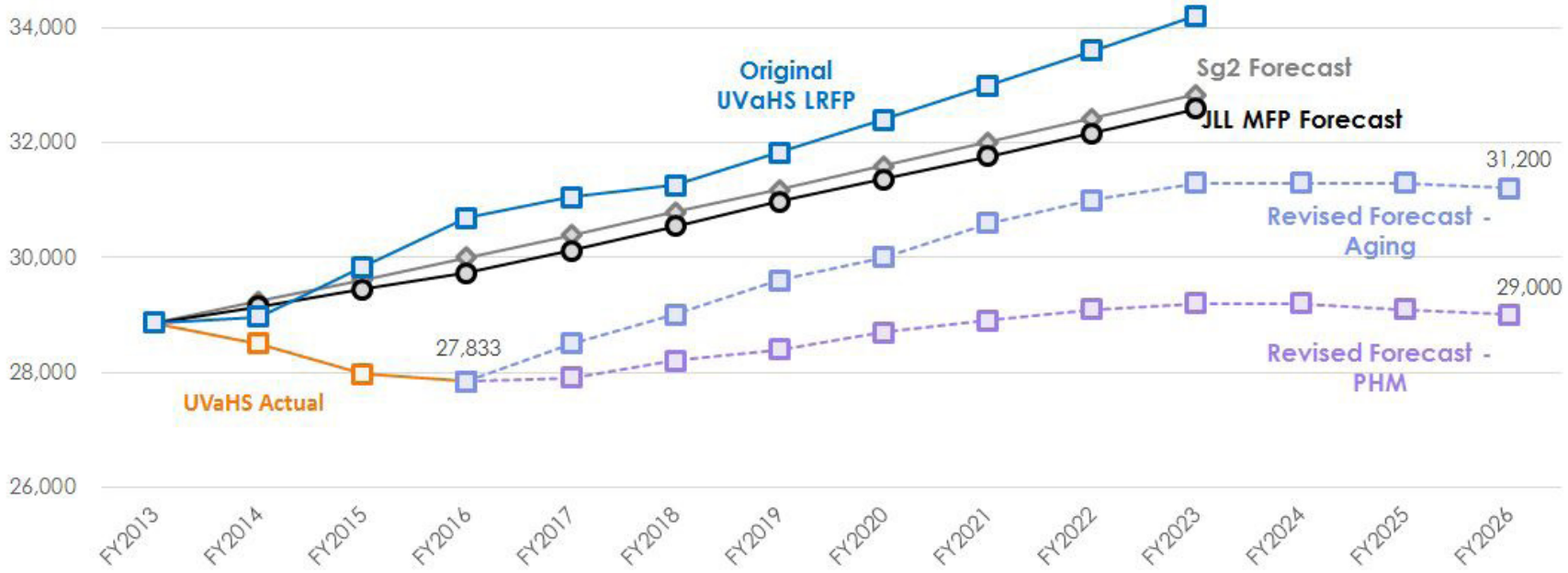


VA %	UVaHS %
12%	17%
31%	31%
57%	52%

Demographics	• Statewide growth of +760,000 population over the next 10 years • Regionalized growth, targeted areas projected outside of major metropolitan areas • 65+ age cohort growing at a rate 3x of other age cohorts, begins to plateau in 2030+	
Inpatient Utilization	• Current IP admission rate of 93 per 1,000 is projected and sensitivity tested to derive a 2026 future planning range of 88-98 admissions per 1,000 population. Scenarios modeled include: - Impact of increased utilization from aging demographics - Continued advancements in preventative medicine, minimally invasive surgery, observational service utilization, and other enhancements	
Market Share	• Baseline forecast assumes constant market share, strategic imperatives to be identified and applied in revised modeling • FY2015 market share figures (excludes normal newborns): - PSA: 35.9% | SSA: 10.5% - Total Service Area (PSA + SSA): 20.1% - State: 3.6%, 5.1% including Culpeper + Novant	
Average Length of Stay	• Historically, ALOS has increased 2.2% per year for the last 3 years. Baseline forecast will assume flat ALOS at 6.0, future strategic initiatives will further test variations - Enhancement of quaternary services - Service line shift in market share - Internal Process/Quality improvement initiatives	

UVa Health System Hospital Baseline Inpatient Forecast

Since initial master planning efforts in 2013, alternative forecast have been developed for UVaHS with varying strategic assumptions. As UVaHS evolves to providing care for a selective market (2M covered lives) and relying on partnerships and affiliations to assist in offsetting lower acuity patient activity, inpatient admissions are expected to grow at a less aggressive rate as seen below when comparing UVaHS original 'Long Range Financial Plan' to the acuity shift models 'Revised Forecast' figures.



1. FY2016 volumes annualized to extend 10-year forecast through 2026, excludes normal newborns. Assumes constant market share, demographic projections, and modeled utilization rates, no strategic variations regarding acuity or ALOS adjustments

Future State Inpatient Environment (Adult Medical/Surgical)

Assuming the future IP care model at UVaHS Hospital continues providing community care across the PSA while being the system leader in tertiary and quaternary services; a series of base assumptions were determined how the impact on admissions, percent critical care vs. acute bed demand and ALOS were modeled. The analysis below models the impact of increasing 'higher' acuity patient cohorts and will require future partners to assist in managing the care of lower acuity patients outside of UVaHS current PSA.

Current Allocation of Pt Days by Bed Type

	% Acute Pt Days	% Critical Care Pt Days
LOW Acuity (<1.4)	94%	6%
MED Acuity (1.4 - 3.0)	85%	15%
HIGH Acuity (>3.0)	61%	39%
ADC	**270**	**85**

Current Allocation of Admissions

	Current Allocation of IP Admissions	Future Allocation of IP Admissions
LOW Acuity (<1.4)	9,537	4,450
MED Acuity (1.4 - 3.0)	8,193	7,130
HIGH Acuity (>3.0)	4,066	6,230
TOTAL	**21,796**	**17,800**

ALOS - Adjusted for Higher Acuity

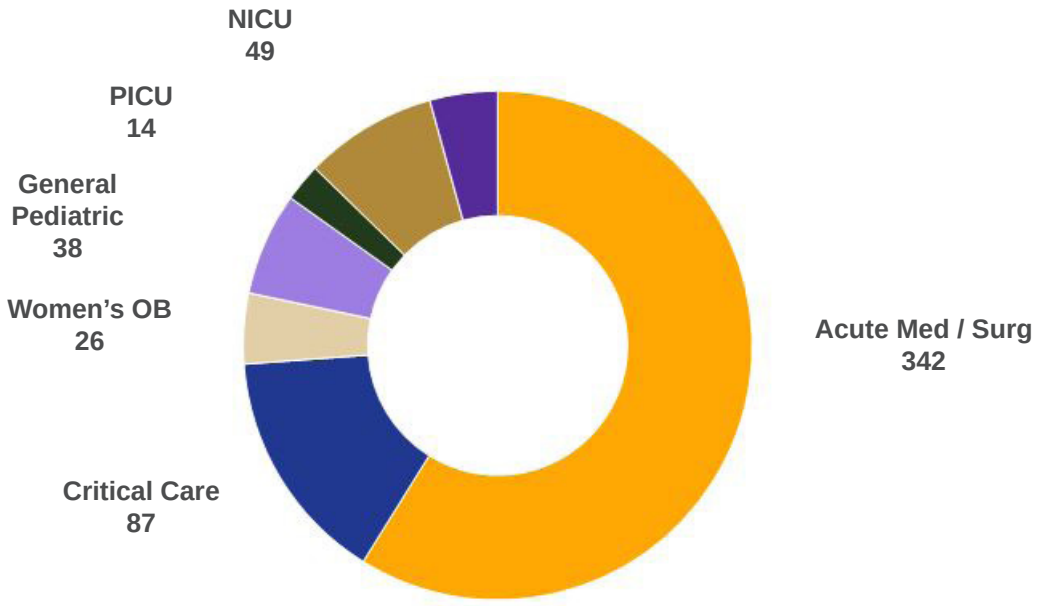
	Current Inpatient ALOS	Future Inpatient ALOS
LOW Acuity (<1.4)	3.9	3.9
MED Acuity (1.4 - 3.0)	5.3	5.3
HIGH Acuity (>3.0)	11.4	11.4
AVERAGE	**5.8**	**7.1**

1. Analysis assumes increase in 'High' and 'Med' classified acuity admissions for Adult Medical/Surgical only, excludes W's-OB, Peds, BH. Va. State market database utilized. Capacity capitated in analysis by IP Tower Expansion providing 430 - 100% private adult med/surgical beds, at 85% occupancy provides availability for 133,000 IP days. Observational demand has been accounted for (24 OBS beds rolled into 'acute' classification)

Current Inpatient Bed Allocation

In order to adjust the bed allocation to respond to future needs focused on higher acuity patients, it is important to first understand the current distribution of inpatient beds. At University Hospital there are currently 581 operational beds, organized by type and acuity as described in the chart below.

Source: data on operational beds from previous reports validated by Kevin Fox, Chris Branin, Todd Campbell



Future IP demand may require:

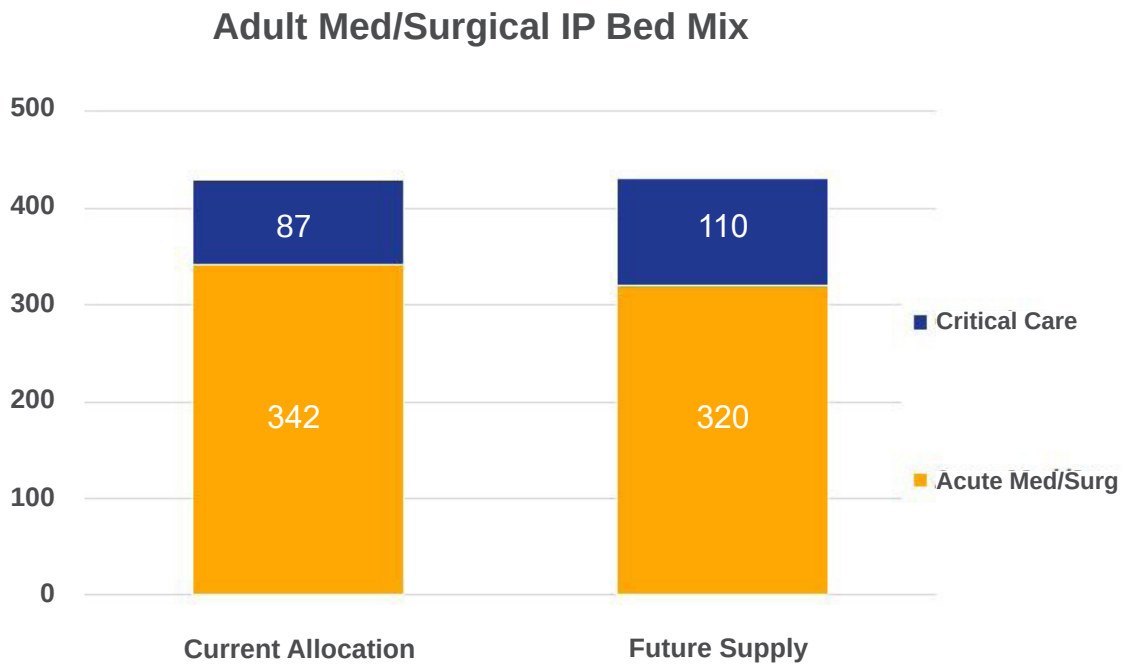
- Higher mix of critical care bed need
- Unit dedication, further support program development
- Designated observational unit
- Improved patient experience
- Operational flexibility, ability to enhance level of operational effectiveness

1. Operational Beds: Beds that are licensed, physically set up, and available for use. – AHRQ

Current Inpatient Adult Med/Surg Allocation and Suggested Future Mix

Of the 581 operational beds, 429 and are currently allocated for adult medical/surgical. In the future, University Hospital will be the hub of the system seeing higher acuity patients in the future (with less acute patients - other than “neighborhood clientele” - being seen by affiliated partners in the region); therefore, the adult medical/surgical beds will need to shift to a greater supply of critical care beds. The below describes the suggested shift in bed acuity mix.

Source: data on operational beds from previous reports validated by Kevin Fox, Chris Branin, Todd Campbell



Assumptions

- 15% increase in ‘High’ acuity admissions in future
- 85% occupancy in future
- 100% Private in future
- ALOS net increase of 1.2 days in future given higher CMI
- Current allocation of ICU vs. Acute patient days by acuity rating
- 24 observation bed demand accounted for within current ‘Acute Med/Surg’

1. Operational Beds: Beds that are licensed, physically set up, and available for use. – AHRQ

Scenario Development | Inpatient/Hospital-Related Priorities

The University Hospital East Expansion will accommodate the bed need and type required for the shift to higher acuity patients. However, other inpatient and hospital-related program components should be considered. The functional priority column lists when these components should be considered based on the pure need, independent of other enabling and competing priorities. The general scope size is also noted. More detail provided in following pages.

Project Description	Functional Priority	Project SF	SF Benchmark
Clinical Laboratory - Option 1, 2 or 3	Short, <5 yrs	**50k GSF**	From Report
NICU Single Family Rooms - 50 Beds	Mid, 5-10 yrs	**28k GSF**	550 DGSF/bed
Behavioral Health Bed Relocation - 25 Beds	Mid, 5-10 yrs	**16k GSF**	650 DGSF/bed
Pharmacy Renovation/Expansion	Long, > 10 yrs	**15k GSF**	25 DGSF/bed
Data Center	Mid, 5-10 yrs	**15k GSF**	Replacement
Patient Support Admin Relocation	Mid, 5-10 yrs	**50k GSF**	Combined
Deferred Equipment Replacements	On-going	**n/a**	n/a
Parking Addition (~200 spots)	Depends	**n/a**	n/a
Traffic Allowance	Depends	**n/a**	n/a

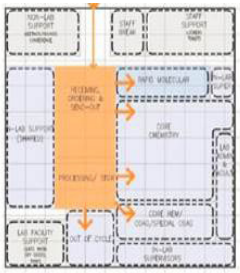
Potential Investment: Clinical Laboratory Options

An immediate need is for a key clinical support component. The existing clinical laboratories are fragmented within poor and landlocked spaces. Three options to address the future needed improvement were identified in a previous study with HERA Lab Planners, summarized below.

Three Clinical Laboratory Options developed by HERA Lab Planners:

Existing Clinical Lab is 50% in West Complex and 50% in Core Lab Building and expansion-in-place is not a future option

1. Split Lab



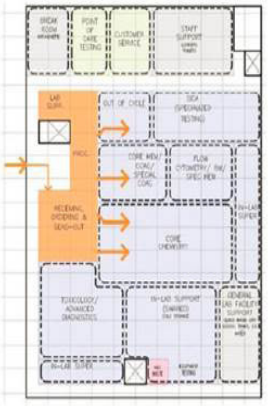
CRITICAL TAT LAB: 17,900 SF

CONTIGUOUS OR ADJACENT TO HOSPITAL; WITHIN P-TUBE DISTANCE

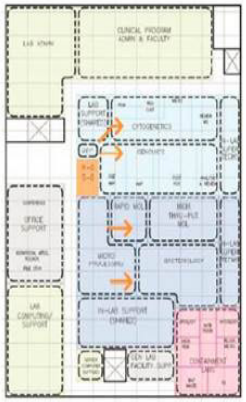
NON CRITICAL TAT LAB: 34,200

ELSEWHERE ON CAMPUS; WITHIN P-TUBE DISTANCE OF HOSPITAL

2. Consolidated Lab



LOWER LEVEL: 24,750 SF



UPPER LEVEL: 24,750 sf

CONTIGUOUS OR ADJACENT TO HOSPITAL; WITHIN P-TUBE DISTANCE

3. Off-site Lab with Stat Lab

STAT LAB: 6,700 sf

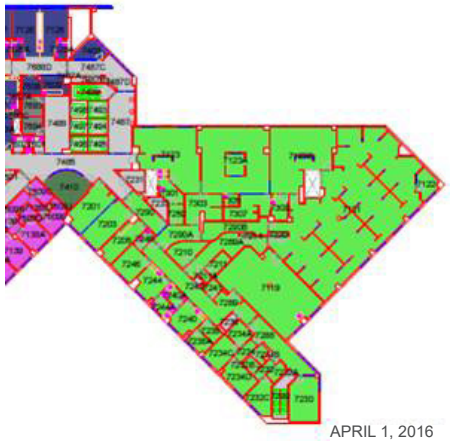
IN MAIN HOSPITAL

OFF-SITE LAB: 47,800 SF

LOCATED OFF-CAMPUS; REQUIRES 24/7 COURIER

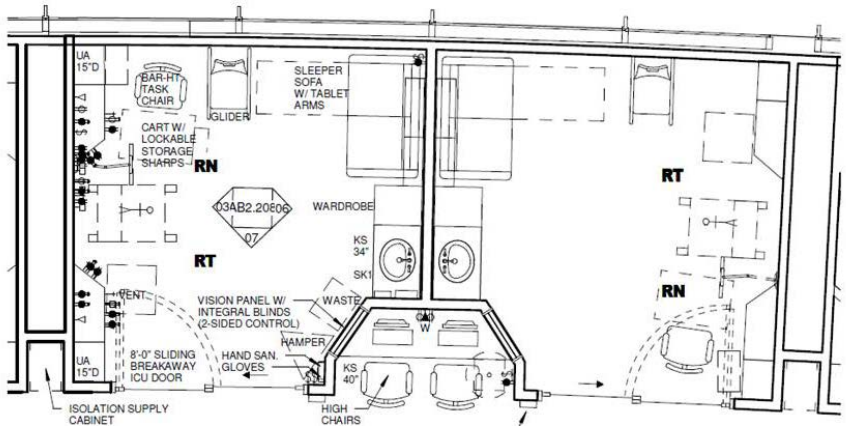
Potential Investment: NICU Single Family Rooms

During the task force planning process and measure phase it was discovered that the neonatal intensive care unit is undersized with a challenging configuration. The contemporary, preferred, and competitive model is single family rooms for privacy. This is operationally very different and requires a great deal more space than the NICU has currently. Relocation should be considered in order to implement this programmatic shift.



- Current NICU is 15,000 DGSF with 49 beds (300/ bed)
- Modern single-family room NICUs are designed at 550 DGSF/bed – example below of an SFR
- 50 beds at 550 DGSF would require 28,000 DGSF

APRIL 1, 2016



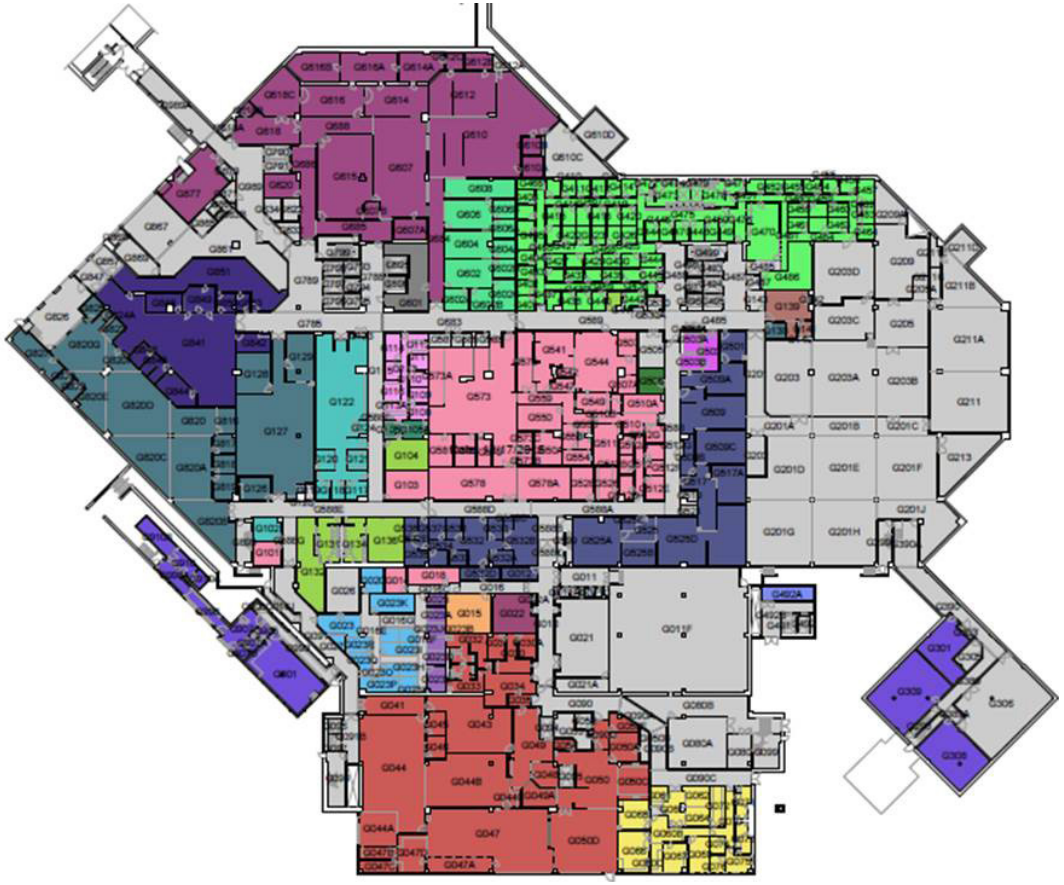
Potential Investment: Behavioral Health Beds

During the task force planning process and measure phase it was discovered that the behavioral health beds are slightly undersized, but more importantly are configured in a geometry that promotes unsafe zones and also create a horizontal barrier between the future east expansion and the other units on Level 05. Relocation should be considered.

- Current unit is 13,600 DGSF with 25 beds (544/bed)
- Modern units are designed at 650 DGSF/bed
- Will be adjacent to hospital expansion tower units
- Size is adequate, location not ideal
  - Currently on 5th Floor
  - Prevents connectivity on 5th floor with expansion

Potential Investment: Pharmacy Renovation/Expansion

During the task force planning process and measure phase it was discovered that the main pharmacy is located in a landlocked position on the basement level of University Hospital, is undersized with configuration challenges, and needs additional technology requiring more square footage (carousels). The pharmacy has submitted space requests stating additional pharmacy related needs such as a specialty pharmacy and centralized sterile compounding.



Main Pharmacy

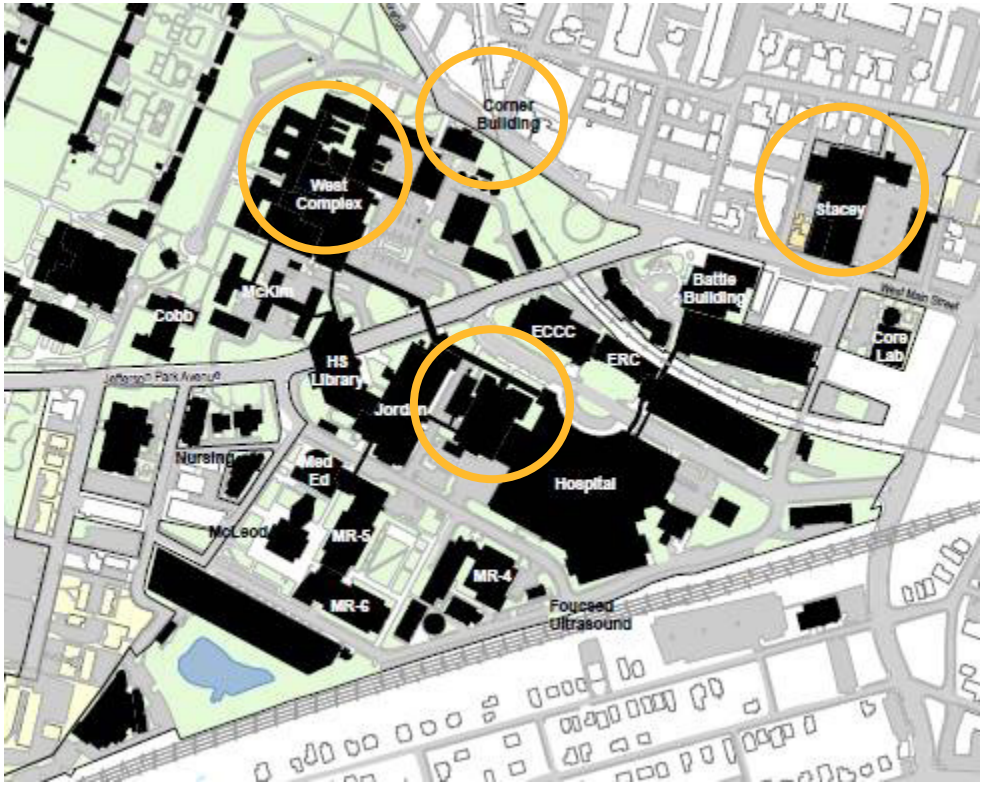
- Current main pharmacy is 11,500 DGSF with need to expand (to 15,000 DGSF)
  - Including investigational drug services expansion
  - Re-model of configuration and workflow
  - Additional carousel

Other Pharmacy Requests

- Specialty Pharmacy (6,000 GSF)
- Centralized Sterile Compounding Center (5,000 GSF)

Potential Investment: Patient Support Administration Relocation

During the task force planning process and measure phase it was discovered that patient support administration is highly fragmented. Below is a summary of the square footage on-grounds alone that could be consolidated and organized.

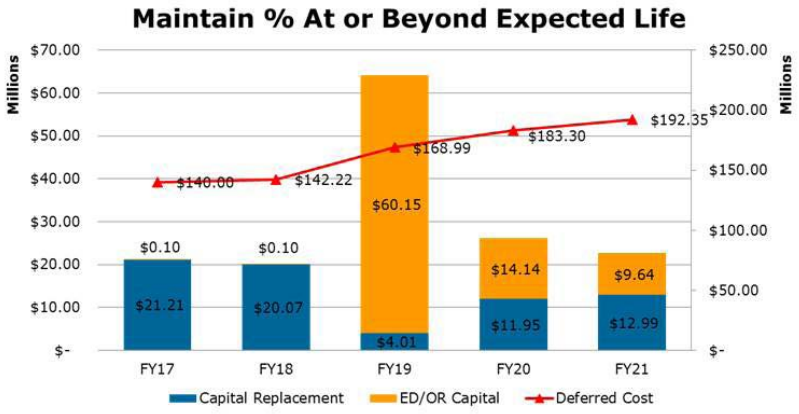


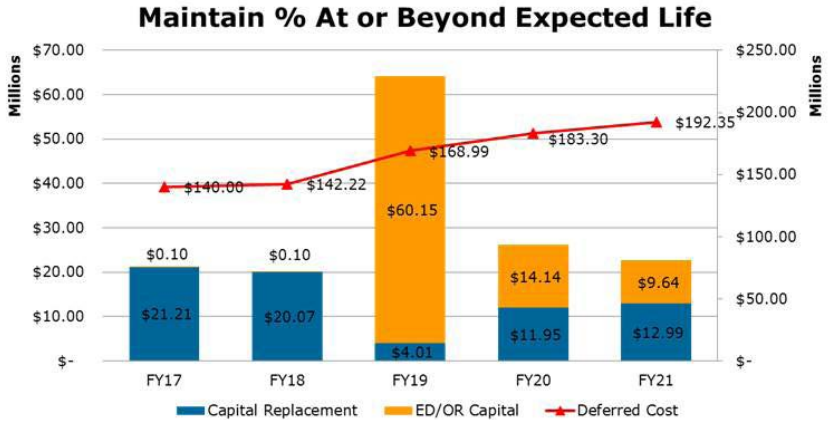
- Opportunities for Hospital Admin Consolidation:
  - Stacey Hall (previous slide) – 47,000 ASF
  - Corner Bldg – 12,000 ASF
  - PCC/PCC Annex – 4,000 ASF
  - JPA MOB – 20,000 ASF
  - West Complex – 30,000 ASF

Potential Investment: Deferred Equipment Replacements

During the task force planning process and measure phase it was discovered that there is a significant amount of equipment replacement costs on the horizon. These should be considered as the integrated space plan is implemented.

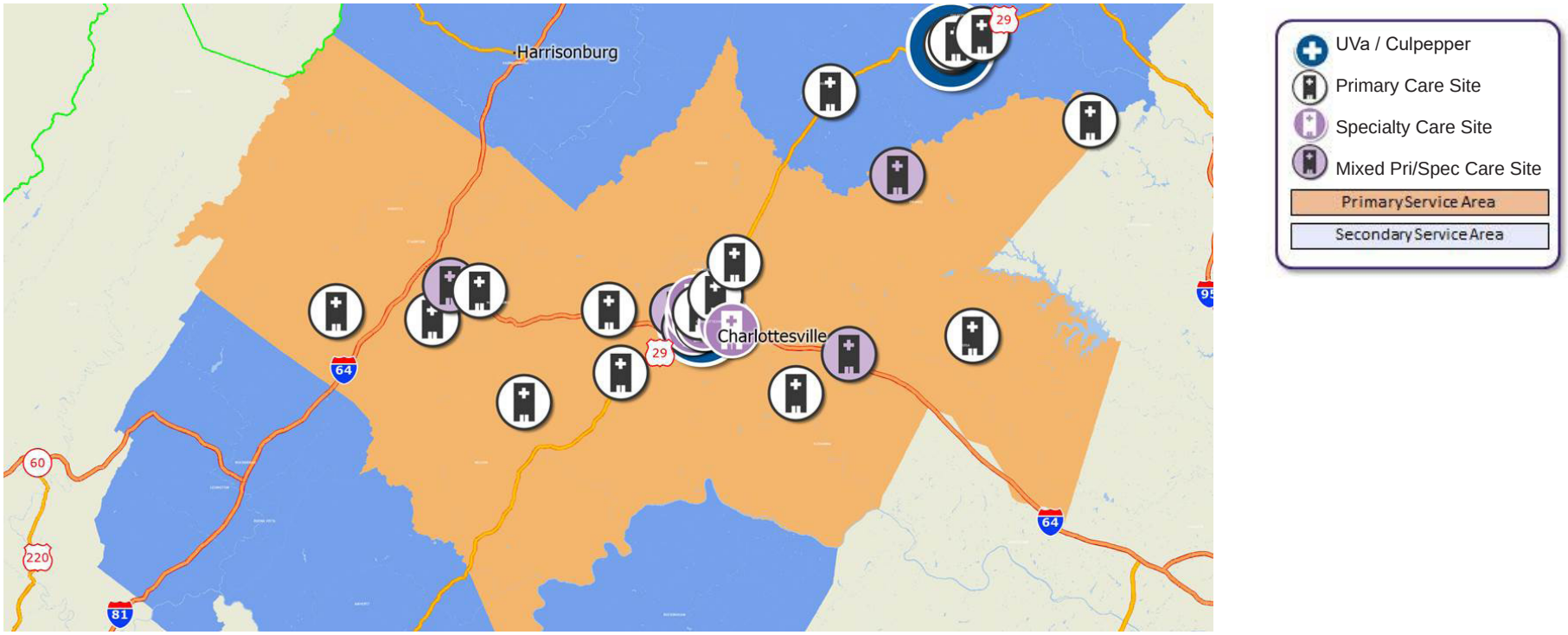
- 36,500+ medical devices
- 50.0% of capital assets at or beyond life expectancy (up from 48.5% in FY16)
- $300M total asset base
- **$133M current deferred cost; two strategies for handling:**





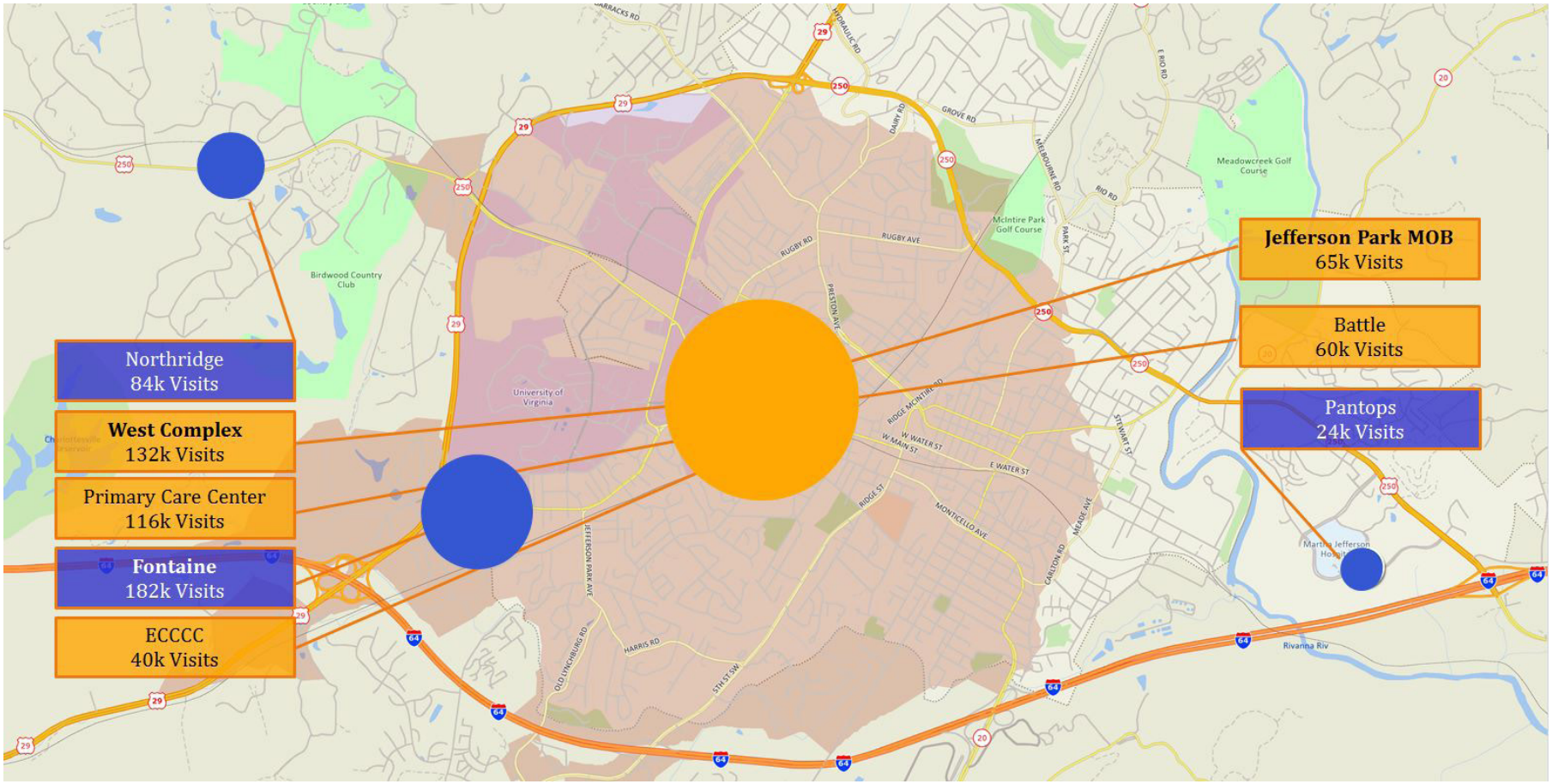
UVa Health System Ambulatory Network

A fundamental challenge for UVaHS is the fragmentation of the ambulatory network. While ambulatory networks are inherently a bit fragmented due to the nature of needing to reach the patients, the UVaHS network is much more fragmented than necessary, particularly in the Charlottesville area. The ISP focused on the ambulatory spatial requirements of the on-grounds and near-grounds zones.



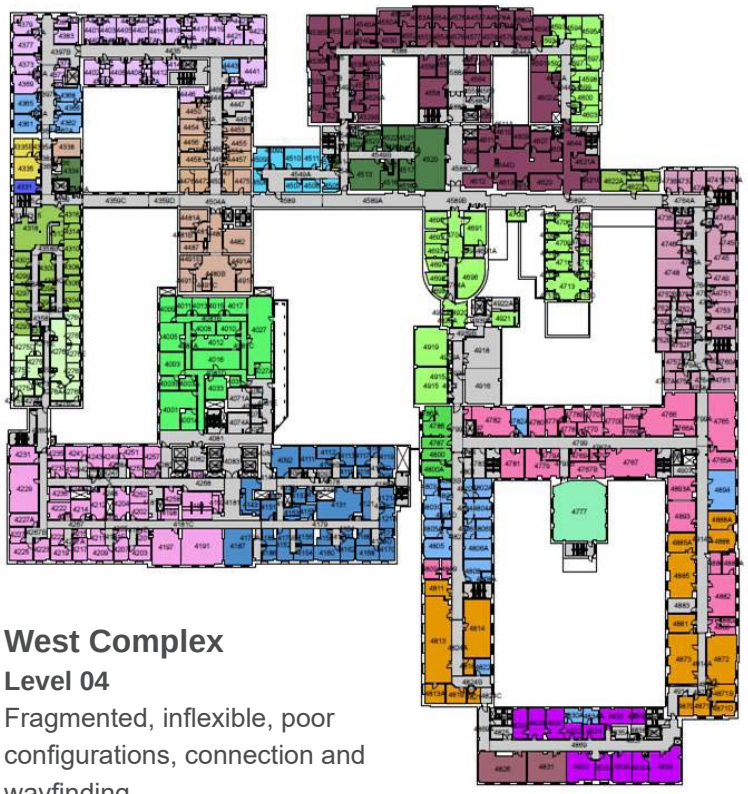
On & Near Grounds Ambulatory Presence

Within about a five minute drive time of the hospital there are eight major ambulatory centers. Some of these are service line specific and near the hospital by design, such as ECCCC and Battle. However, there are several others that accommodate visits but fragment service lines with limited overall organization of the ambulatory system, in addition to being overly sited in Charlottesville.



UVaHS Ambulatory Care Existing Clinic Conditions – Examples

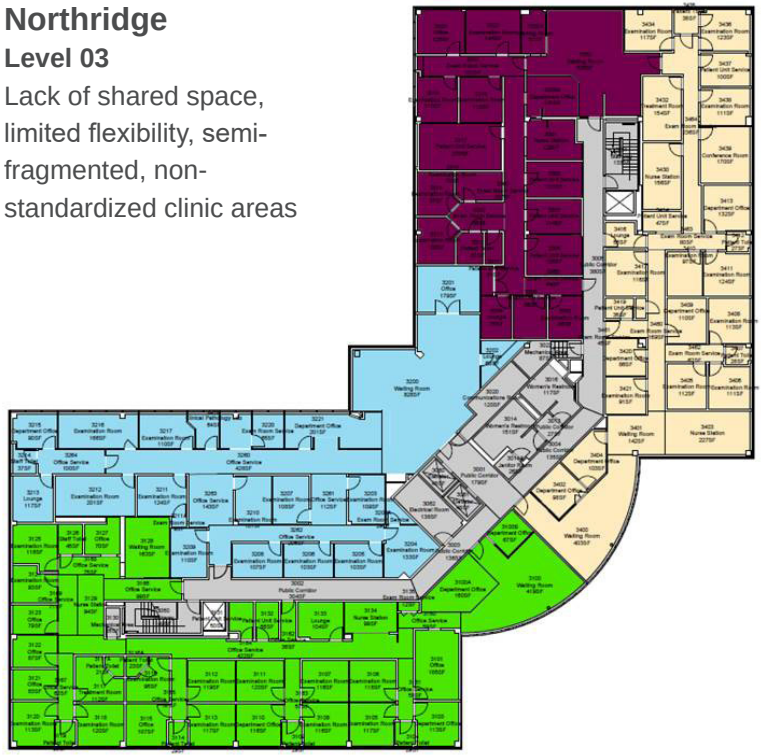
Many of UVaHS' major outpatient buildings present functional planning challenges in configuration, access, adjacencies, and amount and quality of square footage (reference the spatial performance matrix in the clinical overall section). Two examples of challenging ambulatory environments are Northridge (rated 2B-yellow zone) and West Complex (rated 3C- red zone). These environments contribute to lower ambulatory throughput performance.



West Complex

Level 04

Fragmented, inflexible, poor configurations, connection and wayfinding



Northridge

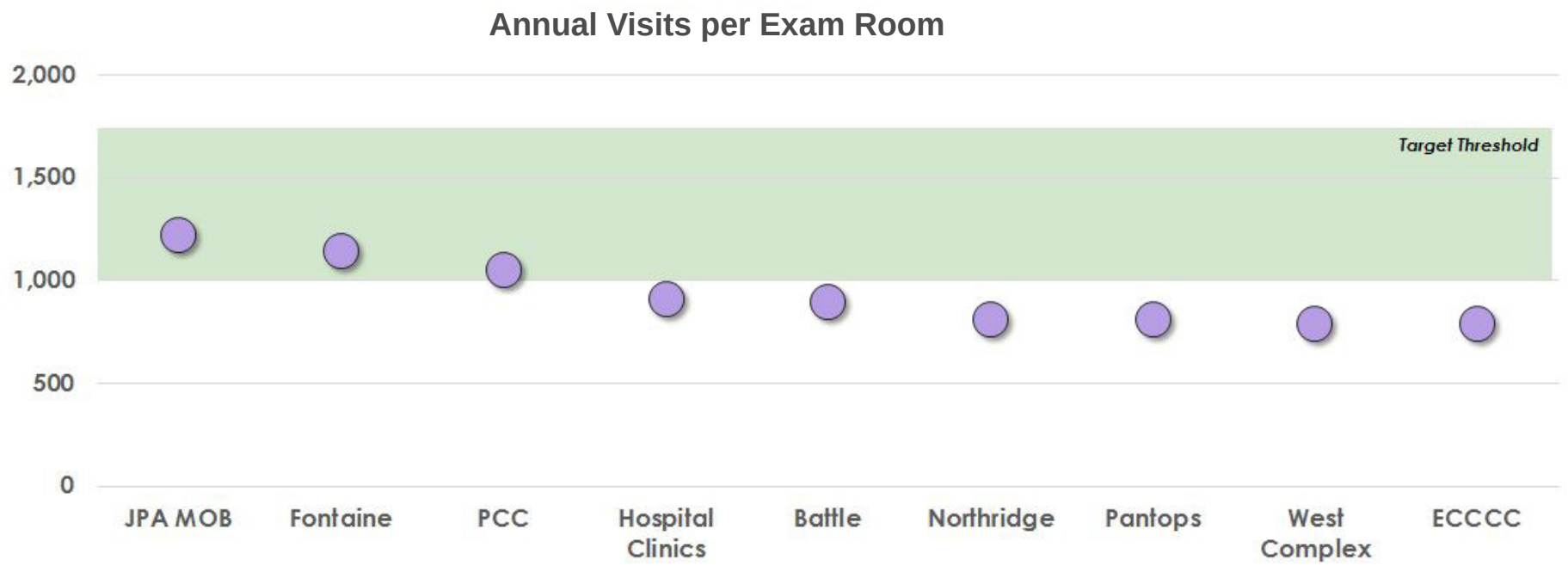
Level 03

Lack of shared space, limited flexibility, semi-fragmented, non-standardized clinic areas

UVa Health System Ambulatory Throughput On & Near Grounds

An important metric in ambulatory planning is annual throughput per exam room. In academic settings clinics can be expected to operate at 1,000 to 1,750 visits per exam room each year (noted by green bar). Below are the results of key UVaHS clinic buildings. Some buildings are below that range due to volume not being maximized for the available capacity yet and/or schedule constraints (ECCCC/Battle) and some are environmentally constrained (WC).

The following page shows the overall ambulatory dashboard of performance by site.



1. Employee Health clinic in JPA MOB was removed, skews site throughput average

UVaHS Ambulatory Dashboard of Performance by Site

Rating System
- Optimal
- Opportunity to Improve
- Sub Optimal

Space / Ex Rm
- 550+ DGSF per Ex Rm
- 450 - 550 DSGF per Ex Rm
- Below 450 DGSF per Ex Rm

Visits / Ex Rm
- 1,500+ Visits / Ex Rm
- 1,000-1,500 Visits / Ex Rm
- Below 1,000 Visits / Ex Rm

	On Grounds							Near Grounds					Off Grounds				
Current	PCC	Hospital Clinics	West Complex	Battle	ECCCC	JPA MOB	On Grounds Total	Fontaine	Northridge	Pantops	Other	Near Grounds Total	Augusta	Zion Crossings	Orange	Other	Off Grounds Total
PATIENT ACTIVITY																	
Annual Patient Visits	116,381	25,947	132,469	59,397	40,726	65,137	**440,000**	182,062	83,947	24,186	36,732	**327,000**	54,602	14,209	32,643	203,075	**305,000**
Specialty	70,290	25,947	132,469	28,203	40,726	13,073	**311,000**	152,839	45,628	19,536	2,806	**221,000**	17,448	-	-	12,856	**31,000**
Primary Care	46,091	-	-	31,194	-	52,064	**129,000**	29,223	38,319	4,650	33,926	**106,000**	37,154	14,209	32,643	190,219	**274,000**
Additional Annual Visit Capacity	75,619	25,053	121,031	41,103	37,274	-	**300,000**	57,938	72,053	20,814	20,268	**171,000**	6,898	17,291	357	42,925	**67,000**
PHYSICAL SPACE																	
Clinical Designated DGSF	57,754	17,074	84,904	41,790	34,956	24,013	**260,000**	69,855	41,489	20,123	26,779	**158,000**	33,172	16,948	10,760	66,814	**128,000**
Current Exam Rms	128	34	169	67	52	41	**491**	160	104	30	38	**332**	41	21	22	164	**248**
Technical/Functional Assessment	**B1**	**B1**	**C3**	**A1**	**A1**	**C2**		**B3**	**B2**	**B1**			**A2**	**A1**	**A1**		
PERFORMANCE																	
DGSF / Exam Room	451	502	502	624	672	586	**530**	437	399	671	705	**476**	809	807	489	407	**516**
Annual Visits / Exam Room	909	763	784	887	783	1,589	**896**	1,138	807	806	967	**985**	1,332	677	1,484	1,238	**1,230**
Visits / Exam Room / Day	3.6	3.1	3.1	3.5	3.1	6.4	**3.6**	4.6	3.2	3.2	3.9	**3.9**	5.3	2.7	5.9	5.0	**4.9**

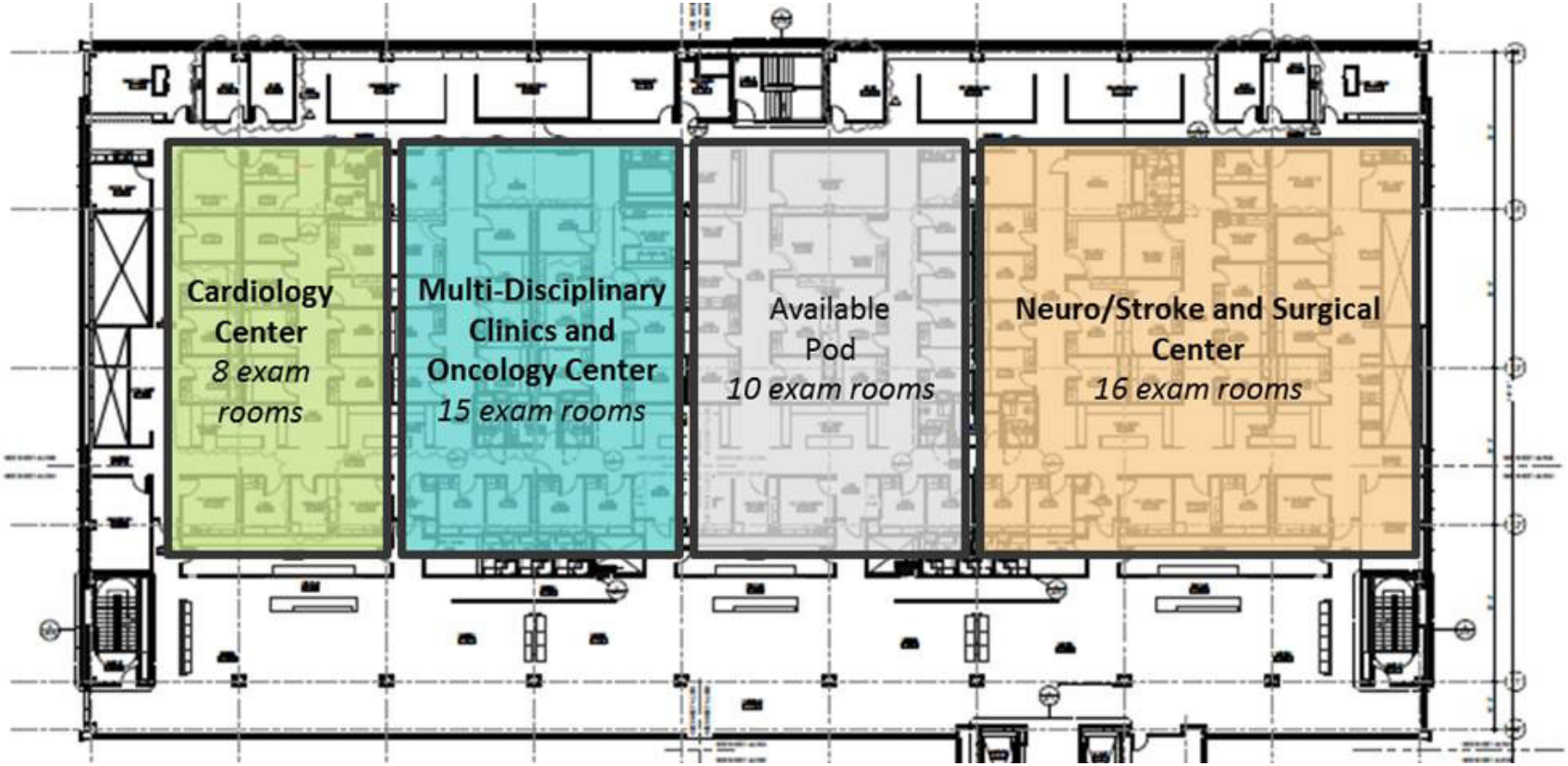
Future Ambulatory Assumptions

In determining the future ambulatory needs in the on-grounds and near-grounds zones, certain targets were used in defining future space. Below are the qualitative and quantitative targets used related to space, operations and experience.

Space	• Modernized, adequate space, supports varying service line needs • Planning standards of **600 DGSF per exam room** provides sufficient space to incorporate support functions, academic and research functions
Operations	• Resources (exam rooms, support space, etc.) to be flexible and shareable, continuously monitored and adjusted appropriately • Higher patient throughput assumed, planning standard of **1,250 annual visits per exam room** will be utilized through alternative concepts
Experience	• Enhancing the patient experience will consider a variety of functions from how a patient arrives to an ambulatory destination through minimizing patient travel and consolidating required ancillary services • Programming will look to enhance **multi- and cross-disciplinary services**

Ambulatory Specialty Center Example: UMC New Orleans

The future model of ambulatory care is founded in standardization and flexibility to encourage highest and best use of premier ambulatory space and enhance operational effectiveness. The below example of the new ambulatory care building at University Medical Center New Orleans expresses the cohorting of specialty clinics into standardized pods. The scheduling dashboards off to the rights show how the pods can be maximized and shared between clinics to optimize the use of the space.



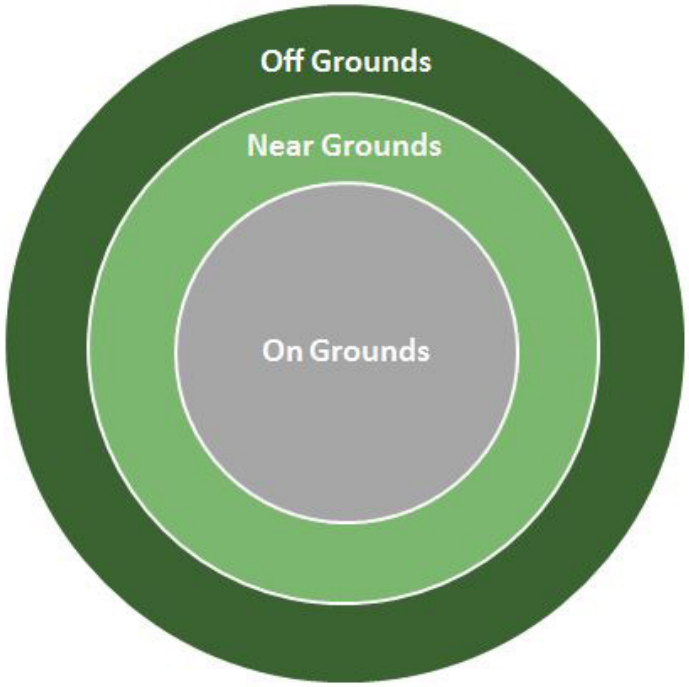
Clinic Name	Current Location	Proposed Location	FY 2014 Volume (Anlz)	M AM	M PM	T AM	T PM	W AM	W PM	R AM	R PM	F AM	F PM
Cardiology - Tulane	UMOB 06	ACB05A	4,148		10		10						
Cardiology - LSU	UMOB 06	ACB05A	3,234								10		
CT Surgery	UMOB 06	ACB05A	298										2
Device - LSU	UMOB 06	ACB05A	250					2		2			
Device - Tulane	UMOB 06	ACB05A	330					2		2			
EP - LSU	UMOB 06	ACB05A	792					4					
EP - Tulane	UMOB 06	ACB05A	222							4			
Heart Failure - LSU	UMOB 06	ACB05A	in cardio	in CD	in CD							in CD	
Heart Failure - Tulane	UMOB 06	ACB05A	in cardio						in CD				
Pod 05A Total		**ACB05A**		**0**	**10**	**0**	**10**	**8**	**0**	**8**	**10**	**0**	**2**

Clinic Name	Current Location	Proposed Location	FY 2014 Volume (Anlz)	M AM	M PM	T AM	T PM	W AM	W PM	R AM	R PM	F AM	F PM
Breast Surgical Oncology	UMOB 05	ACB05B	in HemOn									in HO	in HO
GI - LSU	UMOB 03	ACB05B	1,640									8	
GI - Tulane	UMOB 03	ACB05B	1,844			9							
Hem Onc - LSU	UMOB 03	ACB05B	3,102				5	5			5		
Hem Onc - Tulane	UMOB 03	ACB05B	2,094	5				5					
Renal - LSU	UMOB 03	ACB05B	1,266								6		
Renal (Tulane (hypertension)	UMOB 03	ACB05B	1,000					7					
Urology - LSU	UMOB 03	ACB05B	2,394			5	5					5	
Urology - Tulane	UMOB 03	ACB05B	2,256		5					5	5		
Colon Rectal	UMOB 05	ACB05B	Just open								3		
Multi Disciplinary Clinic (MDC)	UMOB 05	ACB05B	Just open				4						
Psych Oncology - LSU	UMOB 03	ACB05B	in HemOn								in HO		
Thoracic Oncology	UMOB 03	ACB05B	66									1	
Hem Oncology (5th floor)	UMOB 03	ACB05B	in HemOn			in HO	in HO						
POD 05B Total		**ACB05B**		**5**	**5**	**14**	**14**	**17**	**0**	**5**	**19**	**14**	**0**

Clinic Name	Current Location	Proposed Location	FY 2014 Volume (Anlz)	M AM	M PM	T AM	T PM	W AM	W PM	R AM	R PM	F AM	F PM
Neurology - LSU	L & T 01	ACB05C	2,347	8	8								
Neurology - Tulane	L & T 01	ACB05C	1,210			2	2			2	2		
Stroke	L & T 01	ACB05C	478			3							
General Surgery (Trauma/Gen)	UMOB 03	ACB05C	2,640	5	5							5	5
Neurosurgery - LSU	UMOB 03	ACB05C	3,154	5	5			5	5	5			
Neurosurgery NP Clinic	UMOB 03	ACB05C	1,072										
Vascular Surgery	UMOB 03	ACB05C	1,386				7						
Pod OSC Total		**ACB05C**		**20**	**20**	**5**	**9**	**7**	**7**	**9**	**2**	**5**	**5**

Outpatient Geographic Distribution | Service Lines & Physicians

In defining the spatial needs of the UVaHS ambulatory network it was key to define the ideal organization of specialties and service lines. Below is the high-level parameters for clinic placement considering the geographic needs of acuity and research.



Focus on Chronic Specialties, Primary Care to service broader region, high-volume Medical Subspecialties, and moderate rotating surgical specialty coverage

Focus on Acute Medical Specialties, Surgical Specialties with higher outpatient mix and Primary Care to service immediate primary service area

Focus on clinical services with high utilization of Inpatient demand; Interventional and Medical

Scenario Development: Ambulatory Reorganization Principles

The current state of the ambulatory network has a great deal of volume (for both primary and specialty care) occurring on-grounds in the highly-congested medical center site and in multiple buildings of varying quality. In the future more volume should be shifted to the near-grounds and off-grounds zones to decompress the on-grounds zone and properly organize the system – as noted on the right side of the chart below.

CURRENT STATE

440k Visits

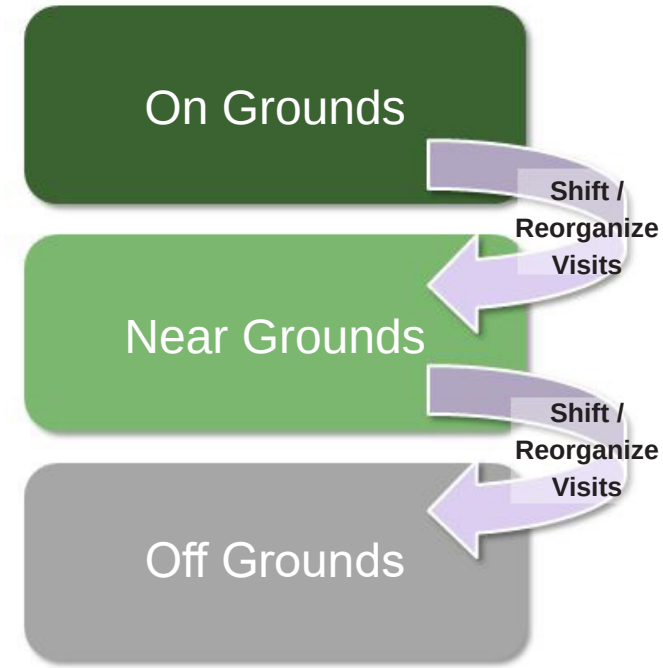
- Specialty Care Visits: 311k
- Primary Care Visits: 129k

327k Visits

- Specialty Care Visits: 221k
- Primary Care Visits 106k

305k Visits

- Specialty Care Visits: 31k
- Primary Care Visits 274k



FUTURE STATE

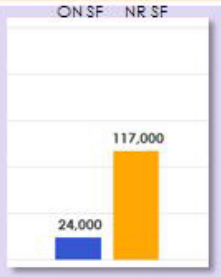
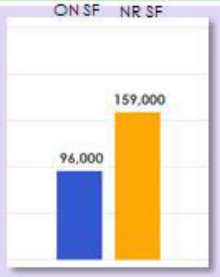
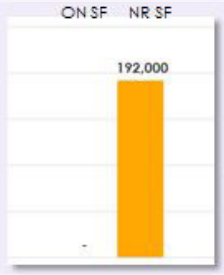
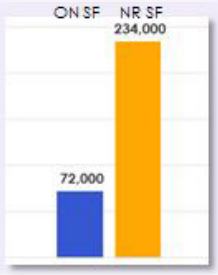
- ECCC and Battle Building maintain current clinical programs
- Proceduralist maintain On-Grounds presence

- Primary care to support local service area demand
- Primary Care Visits 106k
- Outpatient proceduralist

- Primary Care presence
- Medical subspecialties to manage chronic and acute patient cohort needs

Scenario Development |Ambulatory Sensitivity Testing

Sensitivity testing was completed to gain a high-level understanding of what the new ambulatory space requirements would be if certain magnitudes of volume shifting occurred between on, near and off-grounds (demand) and specific existing and challenged outpatient buildings were decommissioned for clinical care. The matrix below shows the square footage requirements on and near-grounds considering two shifting scenarios and two building decommissioning scenarios of varying intensity.

	Maximize Life of Current Assets (Low Cost Alternative)	Aggressive Ambulatory Consolidation (Ideal Ambulatory Alternative)
150k/100k Visit Shift	A Baseline Site Consolidation 150,000 On to Near Shift 100,000 Near to Off Shift 	B Increased Site Consolidation 150,000 On to Near Shift 100,000 Near to Off Shift 
200k/0 Visit Shift	C Baseline Site Consolidation 200,000 On to Near Shift 0 Near to Off Shift 	D Increased Site Consolidation 200,000 On to Near Shift 0 Near to Off Shift 

Scenario Development: Ambulatory Specialty Center Program Definition

Programmatic development for an ASC in the on or near ground zones to replace visits for the decommissioning of aging and reorganization of the ambulatory system in the on and near grounds zones. In this scenario it was assumed that 150,000 visits from on and near would shift to the off grounds zone and that West Complex, JPA MOB, Fontaine and Northridge would decommission for clinics, requiring an ASC supporting over 300,000 visits and needing 250 exam rooms and other ancillary diagnostic and treatment spaces.

The following are the assumed parameters that create the basis for a new ASC:

Demand / Shift of volume:

ON NEAR **150k** OFF

Supply / Decommission space:

West Complex (~135k visits)
JPA MOB (~65k visits)
Fontaine (~180k visits)
Northridge (~85k visits)

On/Near Grounds Spacial Need
Shifting 150k visits away from on/near grounds and replacing the decommissioned supply for 465k visits **requires an ASC supporting 315k visits.** 315k visits/1,250 visits/room = **250 exam rooms**

Program Area/ Department	DGSF/ Room	DGSF Allowance
Clinic **(250 exam rooms)**	600	150,000
Imaging (2 MRs, 2 CTs, etc.)	1,500	12,000
Surgery (8 ORs)	3,000	24,000
Public Space (Food, etc.)	n/a	24,000

Scenario Development: Ambulatory Specialty Center Program Definition

The preceding programmatic assumptions then translate into a building that would be 250,000 – 300,000 building gross square feet.

The following are the assumed parameters that create the basis for a new ASC:

210,000 DGSF
x
1.35
(Building Gross Factor)

283,500 BGSF

250,000 – 300,000*
estimated ASC
(on or near grounds)

On/Near-Grounds Spatial Need
Shifting 150k visits away from on/near grounds and replacing the decommissioned supply for 465k visits **requires an ASC supporting 315k visits.** 315k visits/1,250 visits/room = **250 exam rooms**

Program Area/ Department	DGSF/ Room	DGSF allowance
Clinic **(250 exam rooms)**	600	150,000
Imaging (2 MRs, 2 CTs, etc.)	1,500	12,000
Surgery (8 ORs)	3,000	24,000
Public Space (Food, etc.)	n/a	24,000

Scenario Development: Ambulatory Growth & Incremental Need Testing

If 3% annual growth were to be added to all remaining on and near grounds clinics, then the preceding programmatic definition then the ASC would require an addition 170 exam rooms or over 100,000 departmental gross square feet.

The previous scenario did not include growth; below is the impact with growth:

Ambulatory Grounds Zone	Current Volume	Annual % Growth	10-Year Volume Add	Additional Rooms Required
On-Grounds	440,000			
Near-Grounds	327,000			
Shift to Off-Grounds	(150,000)			
Total	**617,000**	**3%**	**+212,000**	**+170**

170 additional exam rooms requires an additional 100,000+ DGSF of clinic space to the ASC scenario discussed or provided elsewhere.

Ambulatory Recommended Scenario: Summary

The recommended ambulatory scenario has two+ buildings rooted in a reorganization of ambulatory visits that decants 200,000 visits from on grounds – with near grounds and off grounds receiving 100,000 visits each. One building is recommended on grounds to replace West Complex, JPA MOB, and PCC and one building recommended at Fontaine to address "research-focused" visits with additional near grounds consolidation and strategic placement of square footage to address "consumer-oriented" ambulatory visits. The below chart shows the baseline visits and the growth visits effect on square footage and cost requirements. These recommendations have been included into the integrated space plan with moderate priority.

(200)/100/100		Zone Current Visits	On 440k	Near 327k	Off 305k
	Scenario 1	**Shifted Visits**	**(207k)**	**+103k**	**+105k**
	Baseline	Future Visits	233k	430k	410k
		GSF Required[1]	100,000[4]	320,000 - 190,000 Research-Focused[4] - 130,000 Consumer-Oriented[5]	TBD
		Cost[2,3]	$70M	$170-180M (~$110M RF/~$60-70M CO)	TBD
	Growth	Added Visits	13k	44k	30k
		Additional GSF Required[1]	10,000	30,000	TBD
		Additional Cost[2,3]	$5M	$10-15M	TBD
	Total	Total GSF Required[1] and Cost[2,3]	110,000 GSF / $75M	350,000 GSF / $180-195M	

1. Assumption is that West Complex, JPA MOB, PCC, Fontaine, Northridge & Stand-Alone Near Clinics are decomissioned for clinics, PCC not demolished; GSF rooted in 1,250 annual visits/exam room, and 1.55BGSF factor
2. Project Cost per SF used is $450 for Fontaine, $350 for other Near-Grounds sites, $550 for On-Grounds; cost range based on location sensitivity. Equipment costs included as $15M for On-Grounds, $25M for R/F Near, and $15M for C/O Near
3. Parking Costs are not included. Would cost an additional $30M to build two 500-car garages
4. On-Grounds includes allowance for ancillary diagnostic/treatment space; Near-Grounds includes allowance for 8 outpatient ORs and major imaging modalities
5. Sports and Joints Project at Ivy Mountain not included in this calculated new incremental need (estimated 24k baseline clinic visits); Ivy Mountain project currently scoped at 80,000-100,000 GSF ($36M-45M) plus parking

Ambulatory Recommended Scenario: Baseline Detail

Below is service line detail on the reorganization/shifting scenario. Red represents a decrease from current and green represents an increase from current. Decants 200,000 visits away from On-Grounds with Near-Grounds receiving 100,000 visits and Off-Grounds receiving 100,000 visits. Near grounds has been split into expected research-focused and consumer-oriented visits.

UVaHS Service Line	On Grounds	Future On Grounds	Near Grounds	Research Focused	Consumer Focused	Future Near Grounds	Off Grounds	Future Off Grounds	TOTAL
Digestive Health	13,950	7,000		90%	10%	7,000			13,950
Heart and Vascular	39,824	20,000	6,083	75%	25%	26,000	9,818	10,000	55,725
Medical Subspecialties	23,131	8,000	54,507	50%	50%	57,000	36,184	49,000	113,822
Muscoskeletal			87,261	40%	60%	87,000			87,261
Neurosciences & Behaviorial Health	16,938	10,000	35,818	75%	25%	42,000			52,756
Oncology	44,801	45,000	5,000	10%	90%	5,000	9,903	9,900	59,704
Opthamology	42,930	10,000	26,402	50%	50%	49,000		11,000	69,332
Primary Care	93,512	30,000	49,800	0%	100%	66,000	173,024	220,000	316,336
Surgical Subspecialties	70,284	37,000	32,087	40%	60%	51,000	473	15,000	102,844
Transplant	15,442	16,000							15,442
Women's and Children's	79,245	50,000	30,149	10%	90%	40,000	75,127	95,000	184,521
TOTAL	440,057	233,000	327,107	170,000	260,000	430,000	304,529	409,900	1,071,693
VARIANCE		(207,057)				102,893		105,371	

Ambulatory Recommended Scenario: Growth Added Detail

Below is expected growth by service and the distribution of that volume by zone. Decants 200,000 visits away from On-Grounds with Near-Grounds receiving 100,000 visits and Off-Grounds receiving 100,000 visits.

UVaHS Service Line		On Grounds	Future On Grounds		Near Grounds	Research Focused	Consumer Oriented	Future Near Grounds		Off Grounds	Future Off Grounds	TOTAL
Digestive Health	+ 2%/yr	13,950	7,000			90%	10%	7,000	+3k			+ 3k
Heart and Vascular	+ 1.5%/yr	39,824	20,000		6,083	75%	25%	26,000	+9k	9,818	10,000	+ 9k
Medical Subspecialties		23,131	8,000		54,507	50%	50%	57,000		36,184	49,000	
Musculoskeletal	+3%/yr				87,261	40%	60%	87,000			+30k	+ 30k
Neurosciences & Behavioral Health	+2%/yr	16,938	10,000		35,818	75%	25%	42,000	+12k			+ 12k
Oncology	+2%/yr	44,801	45,000	+8k	5,000	10%	90%	5,000	+5k	9,903	9,900	+ 13k
Ophthalmology	+2%/yr	42,930	10,000		26,402	50%	50%	49,000	+15k		11,000	+ 15k
Primary Care		93,512	30,000		49,800	0%	100%	66,000		173,024	220,000	
Surgical Subspecialties		70,284	37,000		32,087	40%	60%	51,000		473	15,000	
Transplant	+3%/yr	15,442	16,000	+5k								+ 5k
Women's and Children's		79,245	50,000		30,149	10%	90%	40,000		75,127	95,000	
TOTAL		440,057	233,000		327,107	170,000	260,000	430,000		304,529	409,900	1,071,693
VARIANCE			(207,057)					102,893			105,371	

MISSION REPORT: RESEARCH

Analysis and Recommendations: Research Mission

Like the Clinical Mission, the Research Mission has an opportunity to shrink into a more efficient frame in the course of ISP implementation. Unlike the Medical Center, which has time in the early years to plan for orderly implementation of a new organization and preparation for a different market, the Medical School faces a crisis in demand for better space to support imminent recruitments which leave it no options but to retool 'on the fly'.

The Integrated Space Planning process developed assumptions about future overall research mission size (in grant dollars), the likely demand for wet and dry lab space, team size, core organization, potential retirements and many other variables. Taken in total, these assumptions create a picture of a successful and growing research operation over the next decade. Unfortunately, the condition of the space with which the School of Medicine begins is poor. Moreover, due to its poor condition too much has had to be assigned to meet the investigative needs. As a result, the School must immediately undertake a process which will lead to changes in space governance while transitioning its physical model through some short-term renovations, all prior to beginning with phased development of new research facilities. The likely result will be some early years of changes and moves prior to eventual consolidation in uniformly newer space and consistently flexible layouts.

Release of the West Complex hinges as much on the School executing multiple complex moves as it does the Medical Center implementing a new ambulatory organization.

School of Medicine (Research) Projects incorporated in the ISP:

- Renovations to two floors of Pinn Hall along new space assignment guidelines (complete 2019)
- Enhanced transit connection between Medical Grounds and Fontaine Research Park (Technology TBD, Complete 2020)
- Ongoing recruitment of new faculty into available Aurbach, Snyder, and Pinn space with limited renovation (ongoing through 2021)
- Clinical Translational Building 1 at Fontaine Research Park with required parking and site enhancements (Complete 2021)
- Backfill/upfit of selected Fontaine Buildings as computational research and office space to support shift of locus of research activity to Fontaine Campus and create educational/conference 'hub' (ongoing beginning 2021, complete 2026)
- First phase decant of West Complex, consolidate in Multistory (complete 2023)
- Construction of 'Bar' Building adjoining MR-5 & 6 to decant offices and support new space assignment paradigm (complete 2025)
- Ongoing renovations/upgrades to Pinn, MR-5 & 6 to University Hospital (TBD 2022-2026)
- Demolition of MR-4 when space is available to decant programs (Complete 2026)
- Relocation of administrative functions to PCC and/or Fontaine office space resources (Complete 2025)
- Release balance of West Complex (including Cobb and McKim Halls) and Multistory (complete 2026)

Research Space Composition

Successful Research Space is composed of Laboratories, Core Facilities and Community space to enhance the social fabric of a health enterprise.

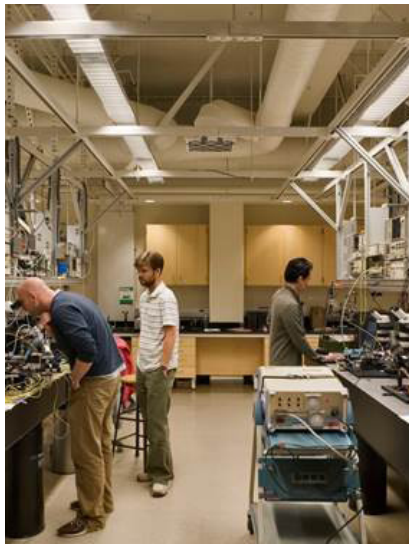
Laboratories

Core Facilities

Social Fabric

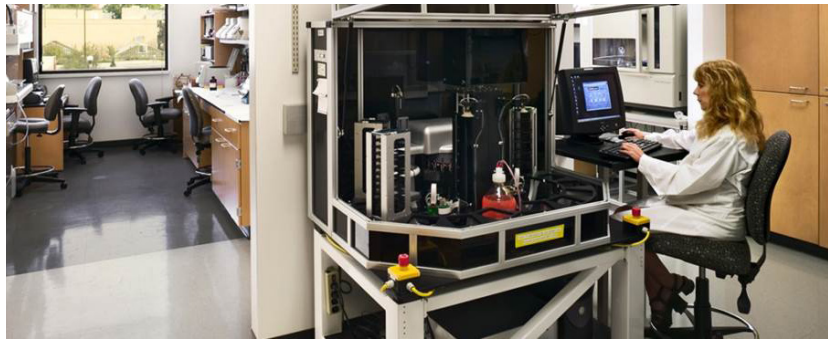
Research Space Composition: Laboratories

Laboratory Space should be flexible and adaptable to different types of research.



Research Space Composition: Core Facilities / Distributed

Shared facilities with specialized equipment used by different teams can be distributed throughout a building when their location isn't driven by infrastructure.



Research Space Composition: Core Facilities / Centralized

Shared facilities with equipment or activities that require dedicated infrastructure and specific operating conditions are often centralized.

Computational

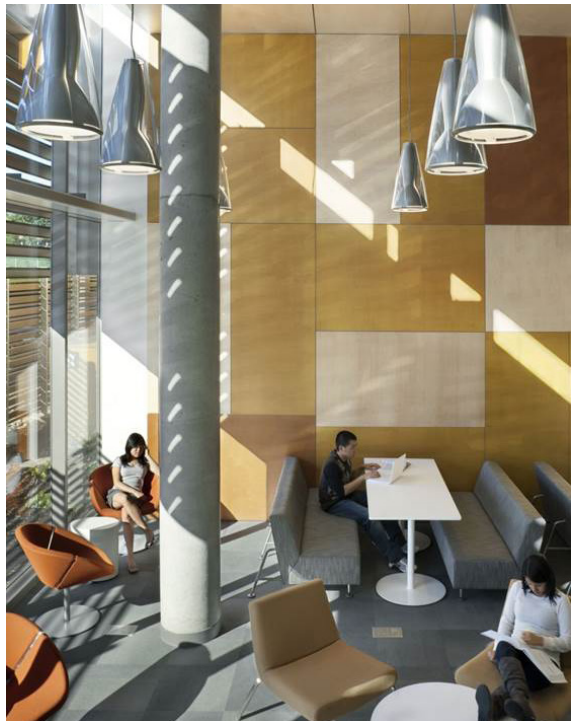
Clean Room

Imaging

Vivarium

Research Space Composition: Social Fabric

Community Space plays an important role in Research Spaces. Group rooms, lounges, and eating spaces allow peers and colleagues to interact outside the lab.



Research Distribution: Wet Lab Types

Wet Labs can be classified into 3 types with varying densities of infrastructure, according to the type of Research being performed.

WET 3
Hood Intensive 4 Hoods/Module
Synthetic Chemistry Chemical Engineering Drug Discovery

WET 2
2 Hoods/Module
Biochemistry Molecular Biology Pharmacology

WET 1
Wet Bench Focused 0.5 Hoods/Module
Biomedical Infectious Disease Micro-biology

Research Distribution: Wet Lab Types

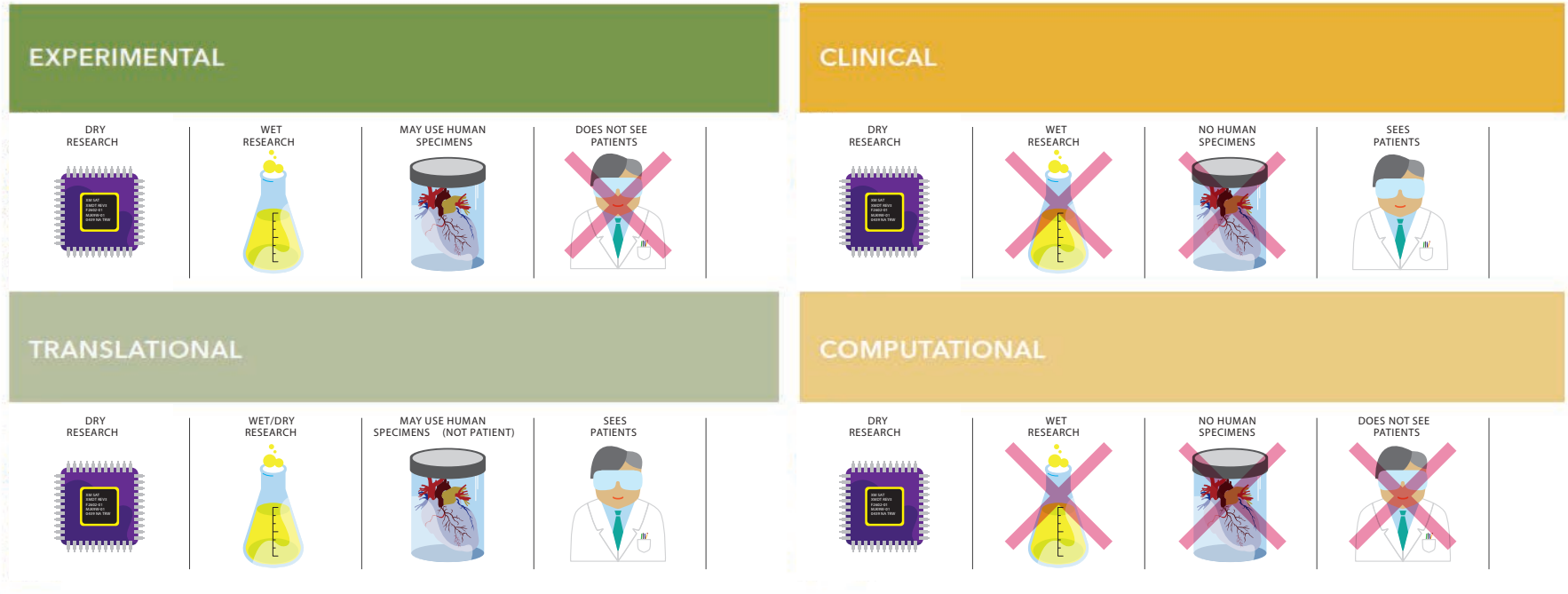
Wet Labs can be classified into 3 types with varying densities of infrastructure, according to the type of Research being performed.

DRY 3	DRY 2	DRY 1
Procedure Intensive 0.25 Hoods/Module	Instrumentation Intensive 0 Hoods/Module	Computation 0 Hoods/Module
Bio-engineering Electro-chemistry Neuro-sciences	Bio-physics Nano-technology Materials Science	Bio-informatics Genomics Theoretical Chemistry

Research Group Phenotypes - Definitions

Researchers were classified into categories based on the range of activities they perform.

These classifications govern the type and amount of space they should be allocated, and where they should be located to optimize their effectiveness.



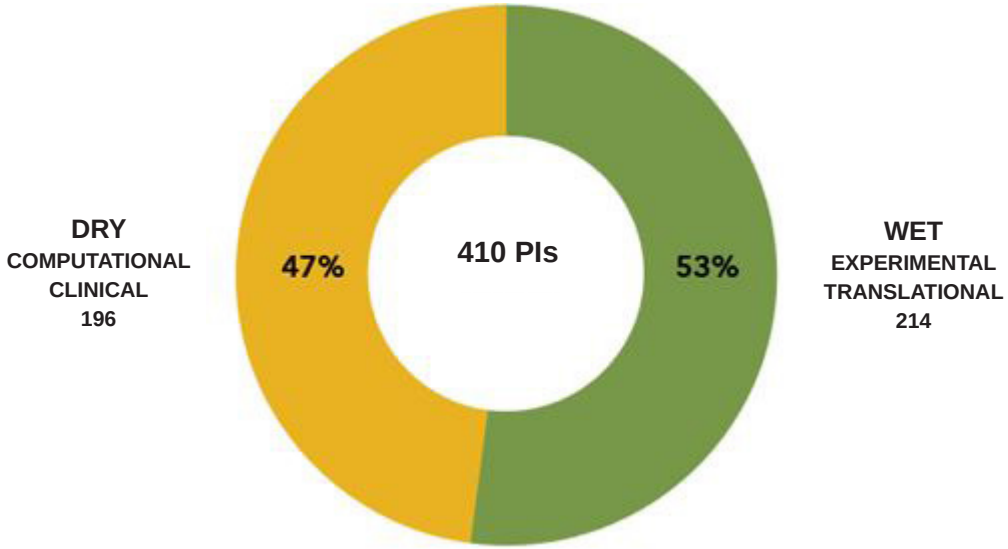
Planning Basis: PIs and Growth

The current number of Wet & Dry researchers is nearly equal, placing UVa ahead of a national trend.

Growth models assume that this ratio of Dry to Wet researchers should remain consistent.

Current PI Types and PI Numbers

FY 2016



PI Growth Model Assumption

FY 2016-25

WET	EXPERIMENTAL	+22
	TRANSLATIONAL	+10
DRY	CLINICAL	+22
	COMPUTATIONAL	+10
	TOTAL NET ADD	+64
	CURRENT PI	410
	TOTAL SoM	474

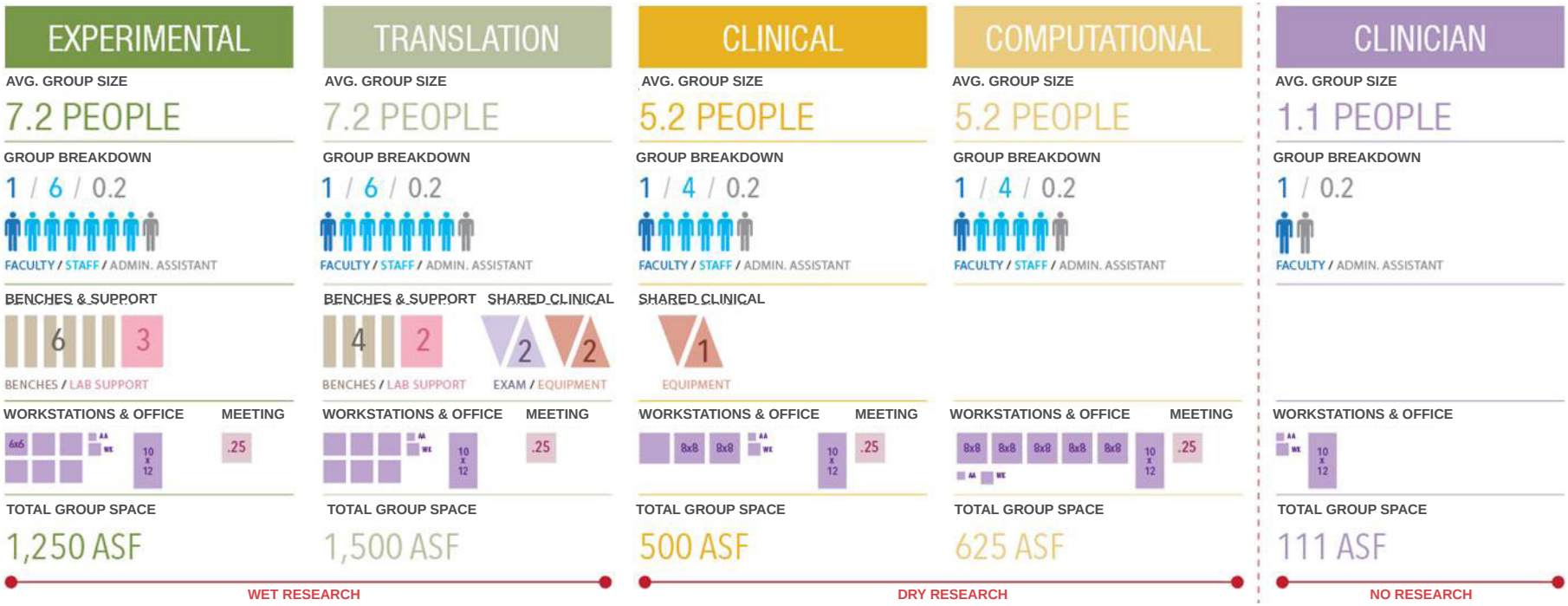
National Benchmarks

Research space allocation scenarios for UVa SoM were benchmarked against conditions at leading medical research universities across the country.

SCHOOL OF MEDICINE	AVG NSF / PI	METHODOLOGY	
Johns Hopkins University	1,500 NSF 40% lab, 40% lab support, 20% office	**GRANT & FTE FORMULA** Existing space controlled by departments.	1. R01: 600 NSF 2. Additional R01: 250 NSF each 3. Each FTE: 100 NSF (i.e.: 2 RO1s + 6 FTEs = 660 + 250 + (6 x 100) = 1,450 NSF
University of Pennsylvania	1,500 NSF 40% lab, 40% lab support, 20% office	**WRITTEN SPACE POLICY** Formal process for additional space requests: 1. Accurate space inventory 2. Maximize space utilization 3. Chairs in other related programs support request 4. Request forwarded to space committee who meet monthly 5. Institutional priorities 6. Quality and impact of research 7. Faculty development 8. Direct and indirect grant dollars 9. Space allocation may be reviewed if it falls below 50% of mean grant dollars directs per NSF for comparable units (i.e. basic, clinical, institutes, centers).	
UC San Francisco	3,000 NSF/PI current at 40/40/20 1,500 NSF/PI future	**BENCH ASSIGNMENT PER FTE** Dean assigns space to Chairs. Chairs evaluated every 5 years. 1 bench / scientist (post doc, grad student or tech)	Ratio lab / lab support: 50/50 Grant dollars / SF not factored into space allocation.
Washington University	1,500 NSF 40% lab, 40% lab support, 20% office	**INDIRECT GRANT $$ PER NSF** 19 Department Heads comprise oversight committee. Indirect grant $$ / NSF evaluated yearly: presented to committee as blind data.	Indirect grant $$ / NSF compared to comparable units> (i.e. preclinical or clinical)
Baylor College of Medicine	1,500 NSF 40% lab, 40% lab support, 20% Office	**TOTAL GRANT $$ PER NSF (DIRECT & INDIRECT)** Historically, space given to chairs to determine function and allocation.	New buildings: Research Dean controls space (“research condominium”) Grant $$ target: 2002: $350/MSF - 2003: $400/NSF
UC Los Angeles	1,200 NSF/PI current 1,500 NSF/PI future	**FTE: FULL TIME EQUIVALENTS** Space allocated by documented and funded FTEs. Adjustments made for type of Research. Grant $ not a factor.	Space allocated by chair. Chair reviewed every 5 years. Indirect grant $ distribution: 50% OOPUC, 25% UCLA Chancellor, 12.5% School of Medicine, 12.5% Department
University of Michigan	1,300 NSF/PI current	**GRANT $$ / NSF & FTE - FORMULA IN DEVELOPMENT** Historically space given to department with infrequent department-wide review. Existing space under chair control with annual review related to grant $ and FTEs.	FTE-PI, Pdoc, Tech, Doctoral Student Incremental Space under dean/research dean control. New budget model: Majority of indirect $ and space-related costs given back to department.

Research Group Phenotypes - Components

Research funding and growth scenarios were applied to the various researcher categories to determine specific targets for team size and space allocation.



Research Space Strategy

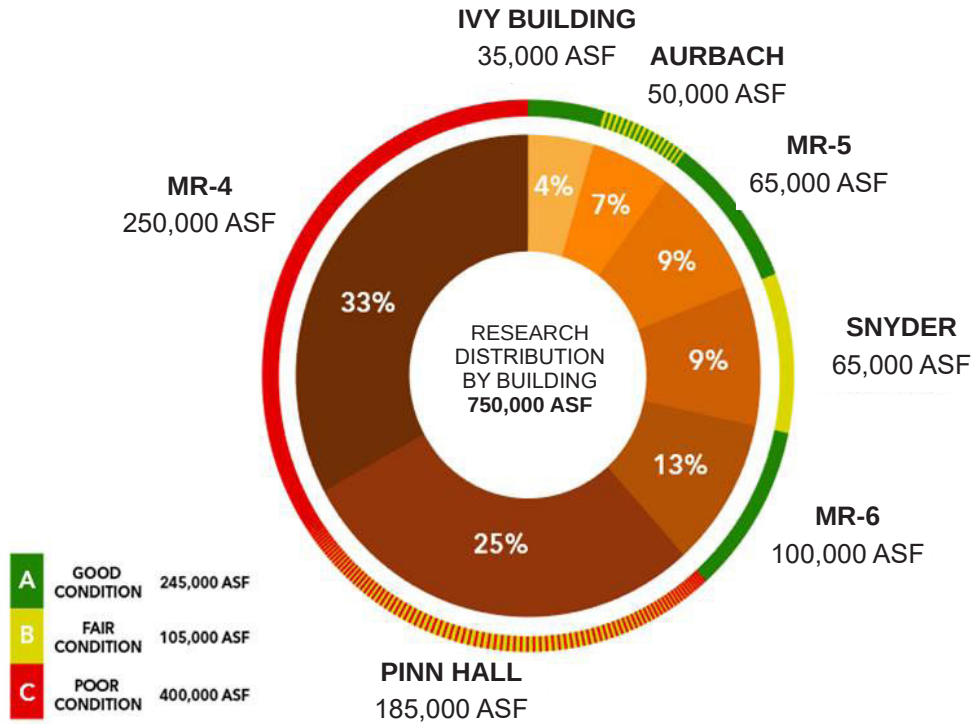
Scenarios showing the relationships between research funding, the number of researchers, and their space allocations - today and in the future. Current space allocations - adjusted to a benchmark of top 20 universities - show that current funding does not support current space allocations. Two scenarios show that the growth targets in research funding, PI count, and team size should be able to occur in less space than currently exists.

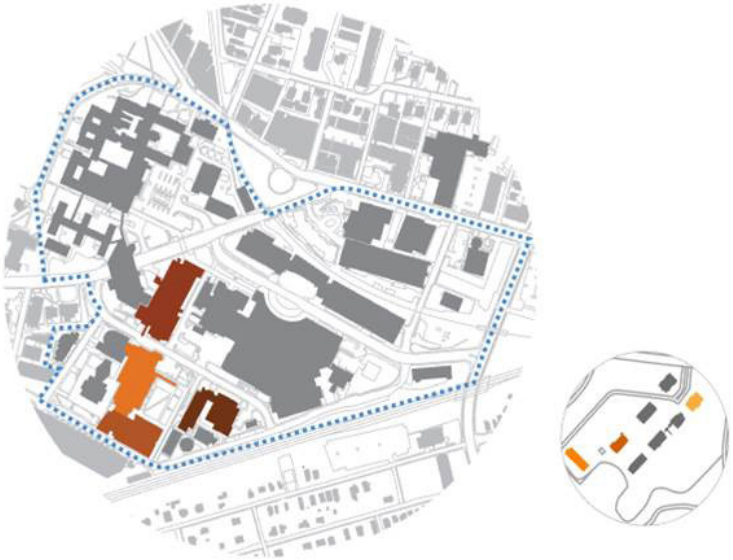
ADJUSTED VARIABLE
RESULTANT VALUE

	CURRENT (2016) Existing Inventory	CURRENT (2016) Adjusted to Top 20 Benchmark	PROPOSED (2026) Top-Down Method ($/ Year) / ($/ASF)	PROPOSED (2026) Bottom-up Method (Researchers) x (ASF/Researcher)	% CHANGE
SoM RESEARCH $					
$ / YEAR 2016 Dollars	$205,000,000	$205,000,000	$300,000,000	$300,000,000	+ 46%
$ / PI /YEAR Average	$500,000	$500,000	$630,000	$630,000	+ 26%
$ / ASF	$272	$455 ($500 TARGET)	$500	$520	+ 84%
RESEARCHERS					
PI, RO1, ETC.	410	410	474	474	+ 16%
AVG. TEAM SIZE FTE only, without Undergrads	3	6	6	6	+100%
AREA					
ASF/RESEARCHER Blended Wet + Dry Avg.	1,837	1,100	1,266	1,217	- 34%
ASF Laboratory + Office	753,000	451,000	600,000	576,750	- 23%
OCCUPANCY RATE	55%	80%-100%	80%	80%	+ 45%

Research Distribution and Quality

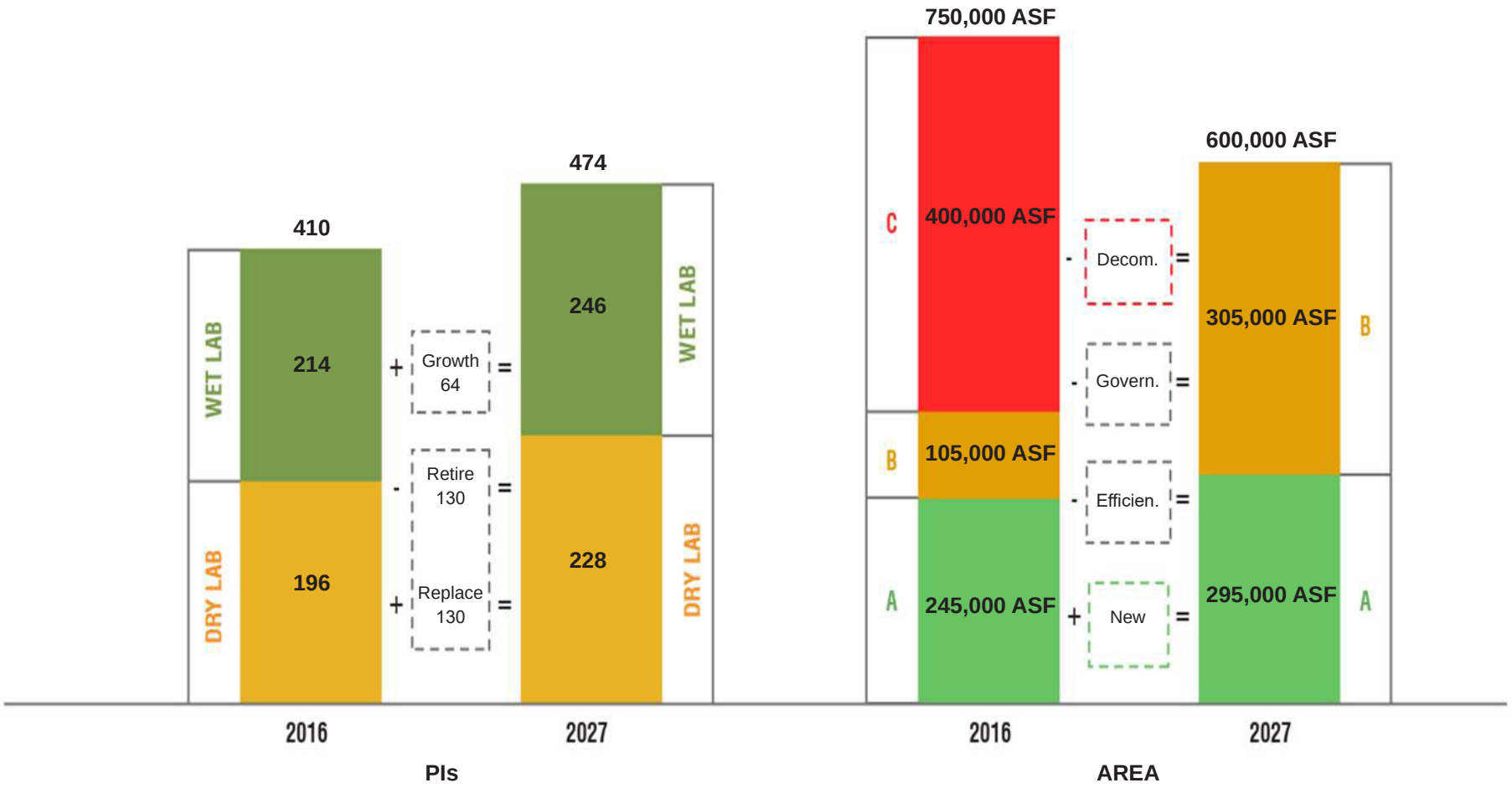
Research Space located On and Near Campus.
Approximately 1/4 of the total is found in “A” quality space. The remainder is in fair – poor condition.
This inventory of fair – poor quality space is an obstacle to recruitment and to meeting the space projections modeled in the Scenarios.





Research PI Count and Space Quality Distribution

Researcher growth targets for the next 10-years include the replacement of researchers who are anticipated to retire.
Area projections show that SoM's ability to meet these growth targets in less space will require a combination of actions:
Decommission existing Class C space, change governance standards for the assignment of space, improve efficiency of existing space through selective renovation, construct new Class A space.



Inhale Concept Study: Pinn Hall Proposed

The need to meet the anticipated 20-30% growth in the STEM fields will require a number of significant renovations to occur over the next several years. The added demand is not sustainable in the existing buildings. However, many of these buildings are prime candidates for investment and, in a renovated state, will meet the projected enrollment growth, supporting the pedagogical shifts in STEM and serving the College of Arts and Sciences and the School of Engineering and Applied Science well into the future.

Existing Floor:

18 PIs

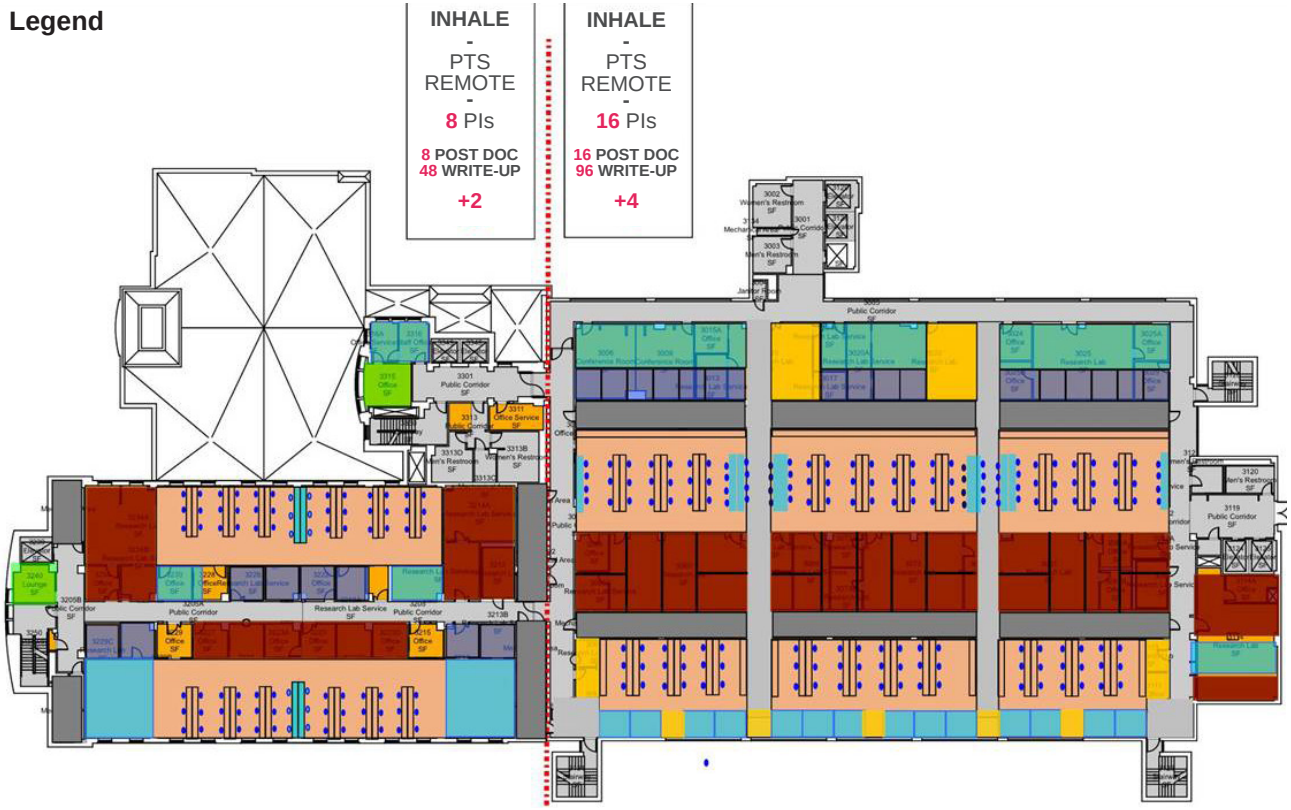
Inhale Concept Study: Pinn Hall | Proposed

Test studies demonstrated that the number of research groups per floor should be able to be increased by 25%

Renovated Floor:

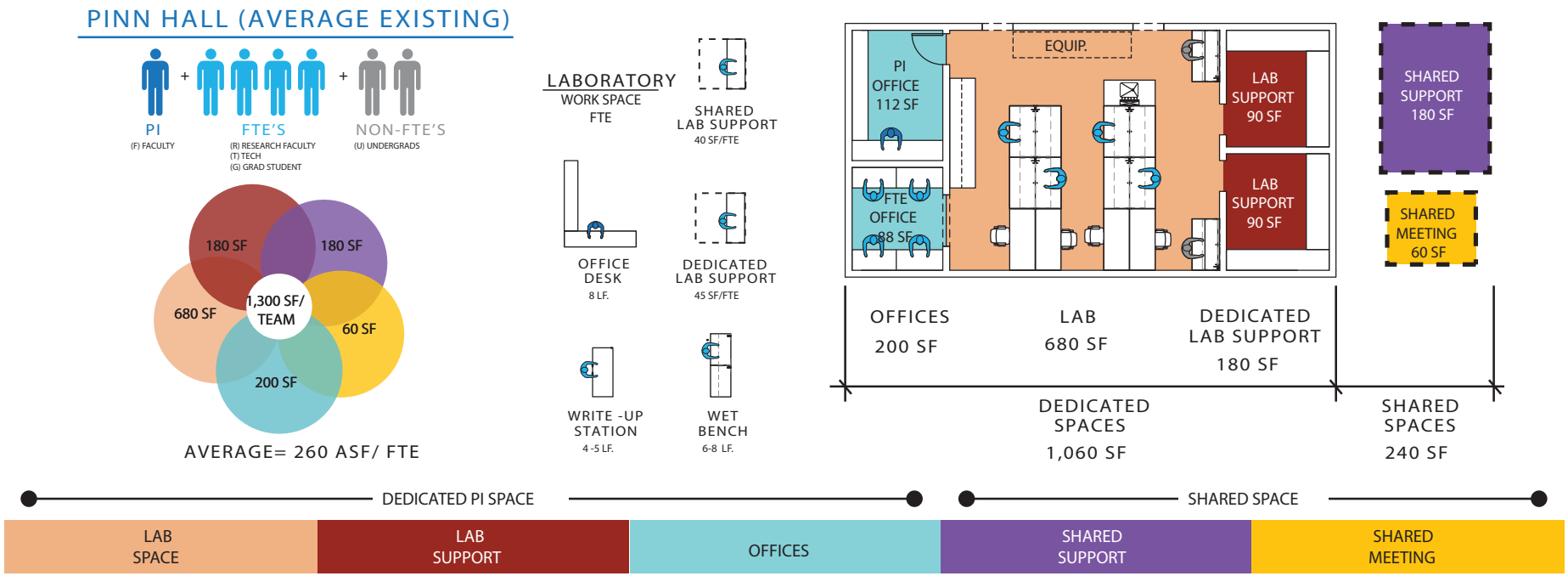
22 - 24 PIs

Legend



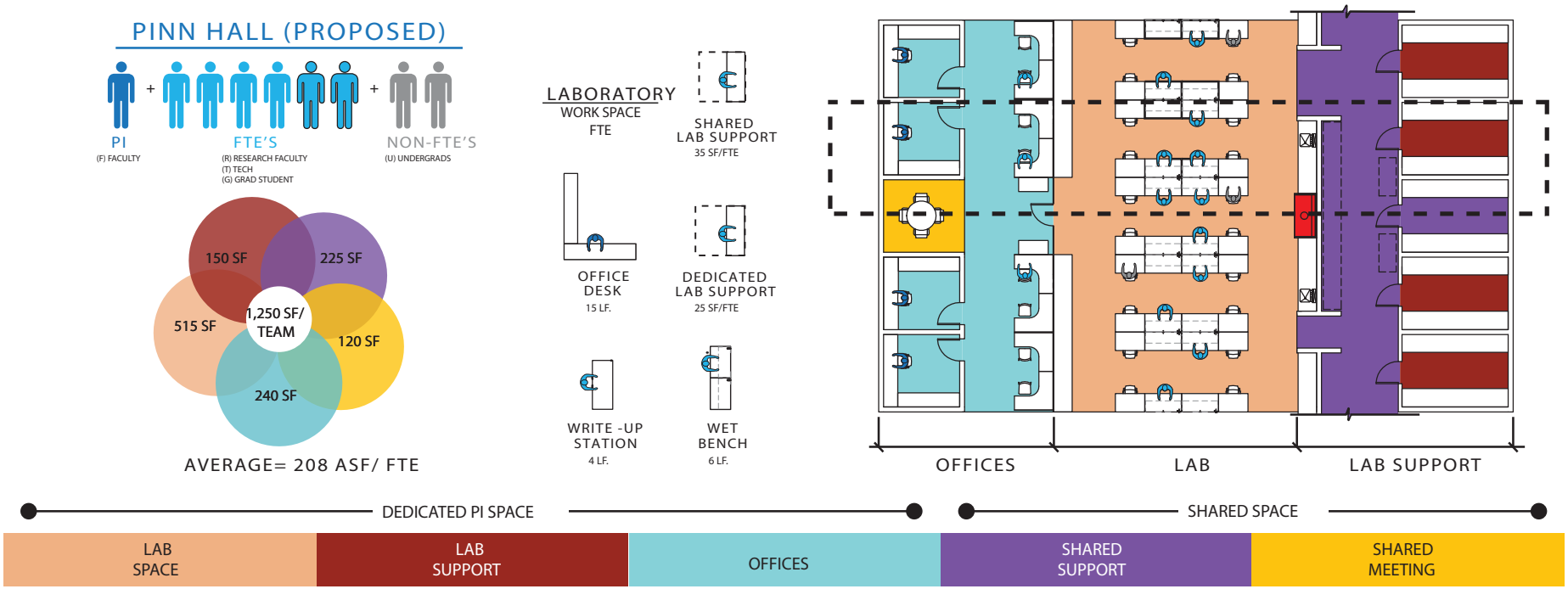
Inhale Concept Study: Pinn Hall Existing

Currently, a fixed suite of space is dedicated to each research group, making it difficult to accommodate changes in team size or share support space.



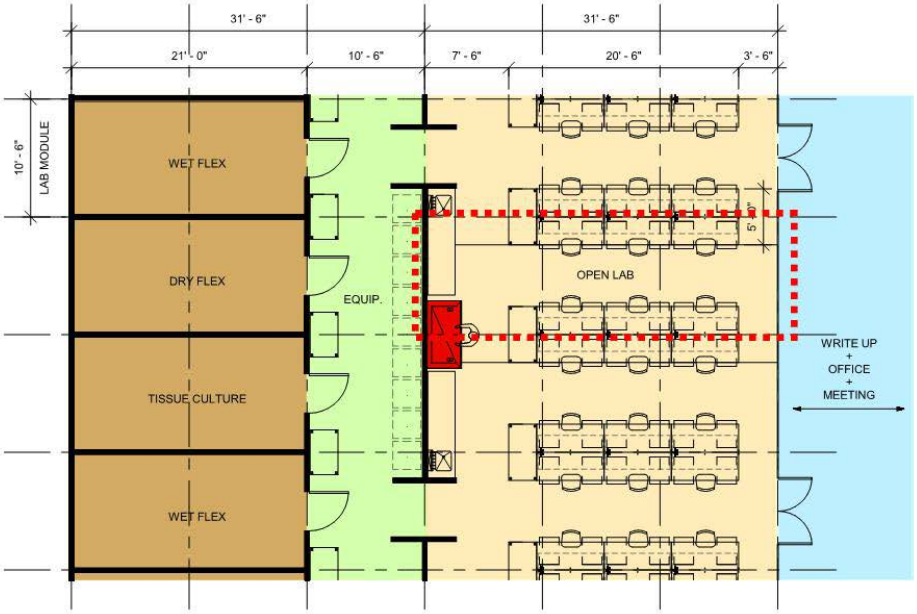
Inhale Concept Study: Pinn Hall Proposed

An open bench planning concept enables team sizes to change without requiring renovation, and support spaces to be easily shared.



Research Distribution: Wet Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



WET 1

Low Hood Density

Biomedical

High Density Bench
Medium Density Procedure
Low Hood Density

1 : 1

LAB SUPPORT

AREA: 330 SF

PEOPLE: 6

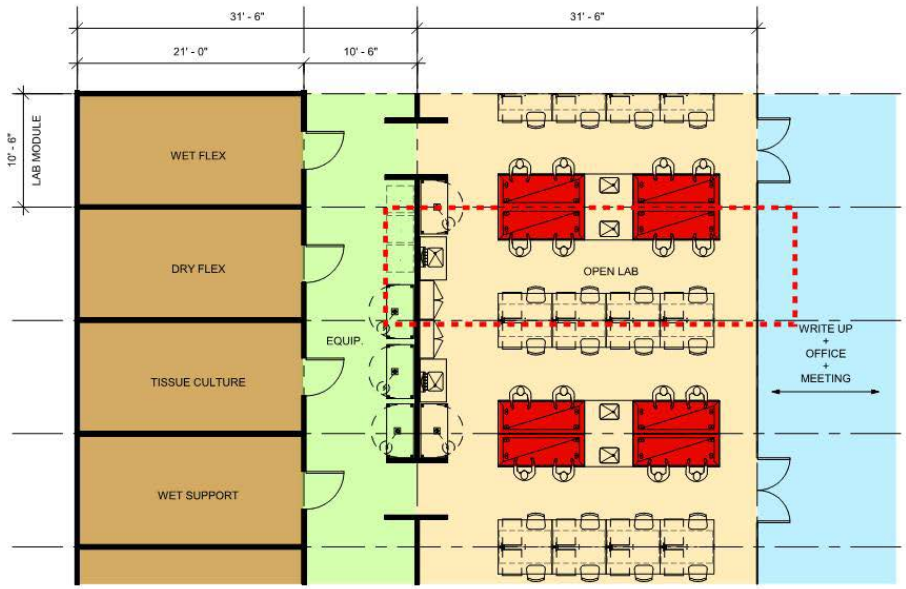
BENCH: 36'

WRITE-UP: 24'

HOODS: 1/3

Research Distribution: Wet Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



WET 2

Medium Hood Density

Biochemistry

Medium Density Bench
Medium Density Procedure
Medium Hood Density

1 : 1
LAB SUPPORT

AREA: 330 SF

WRITE-UP: 16′

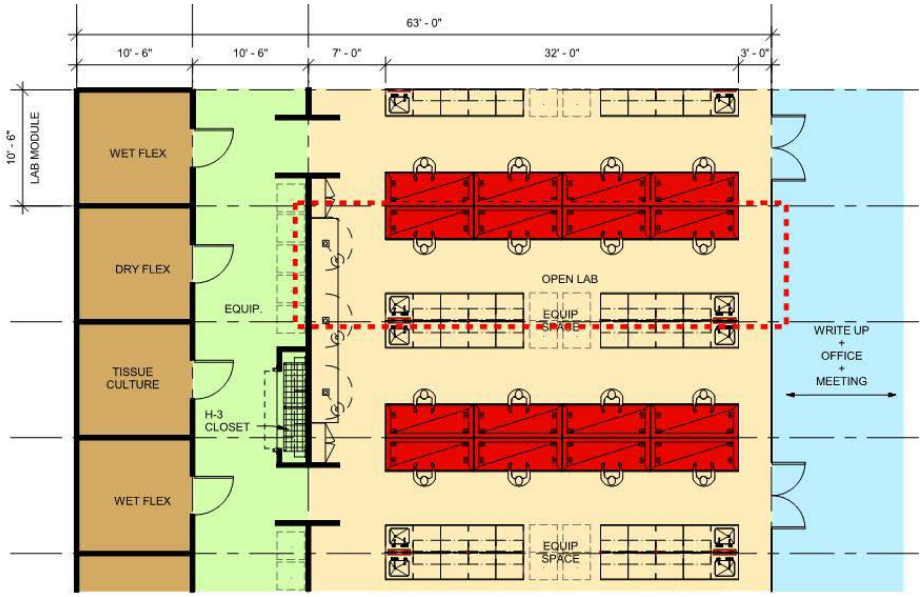
PEOPLE: 4

HOODS: 2

BENCH: 20′

Research Distribution: Wet Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



WET 3

High Hood Density

Chemistry

Low Density Bench
Low Density Procedure
High Hood Density

1 : 0.25
LAB SUPPORT

AREA: 438 SF

WRITE-UP: 16′

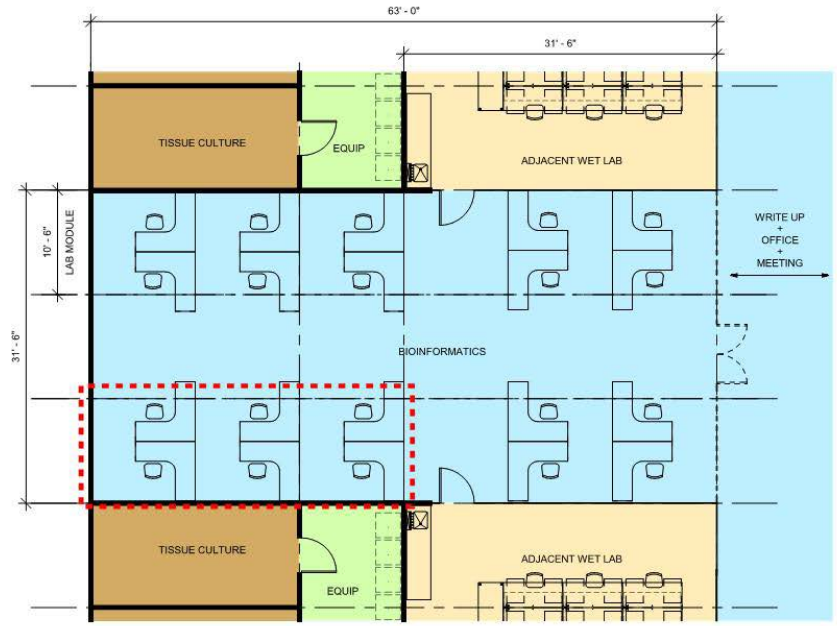
PEOPLE: 4

HOODS: 4

BENCH: 25′

Research Distribution: Dry Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



DRY 1

Data Intensive

Computation

Same Overhead Services as Wet 1 Lab
Convertible to Wet 1 Lab

1 : 0.75

LAB SUPPORT

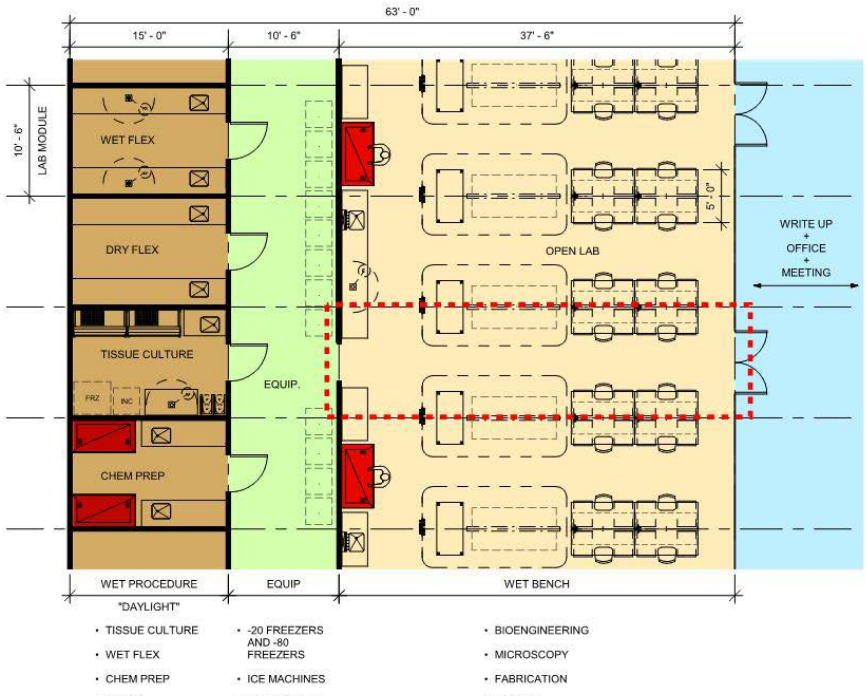
AREA: 329 SF

PEOPLE: 6

BENCH: 60'

Research Distribution: Dry Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



DRY 2

Equipment Intensive

Flexible

Low Density Bench
High Density Equipment Bays
Low Density Fume Hoods
Medium Density Wet and Dry Procedure

1 : 0.75

LAB SUPPORT

AREA: 391 SF

WRITE-UP: 16′

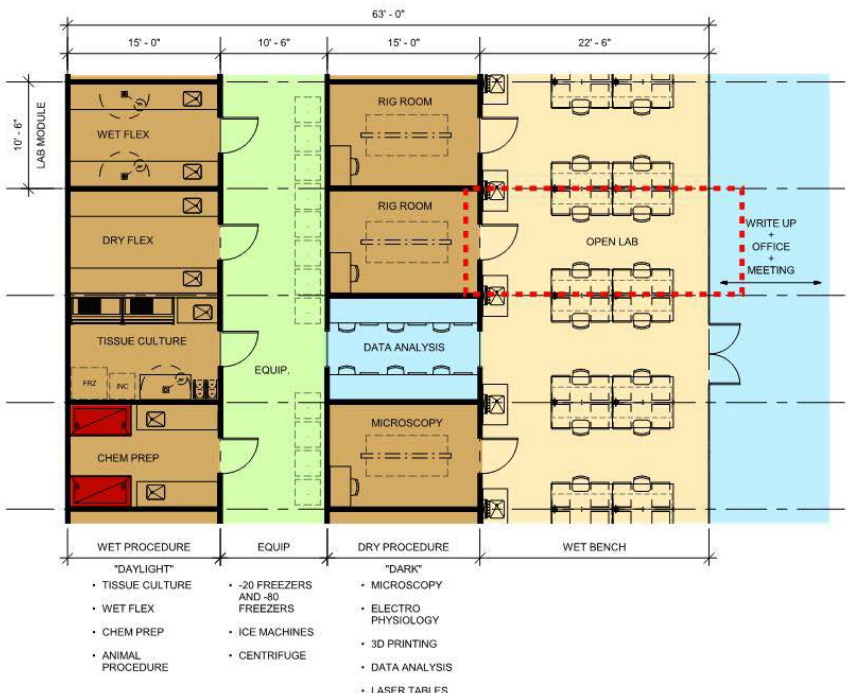
PEOPLE: 4

HOODS: 1/3

BENCH: 24′

Research Distribution: Dry Lab Types

Planning models for each Lab Type adapted to the specific planning metrics developed in the ISP.



DRY 3

Procedure Intensive

Flexible

Low Density Bench
High Density Wet + Dry Procedure
Low Hood Density

1 : 1.25

LAB SUPPORT

AREA: 233 SF

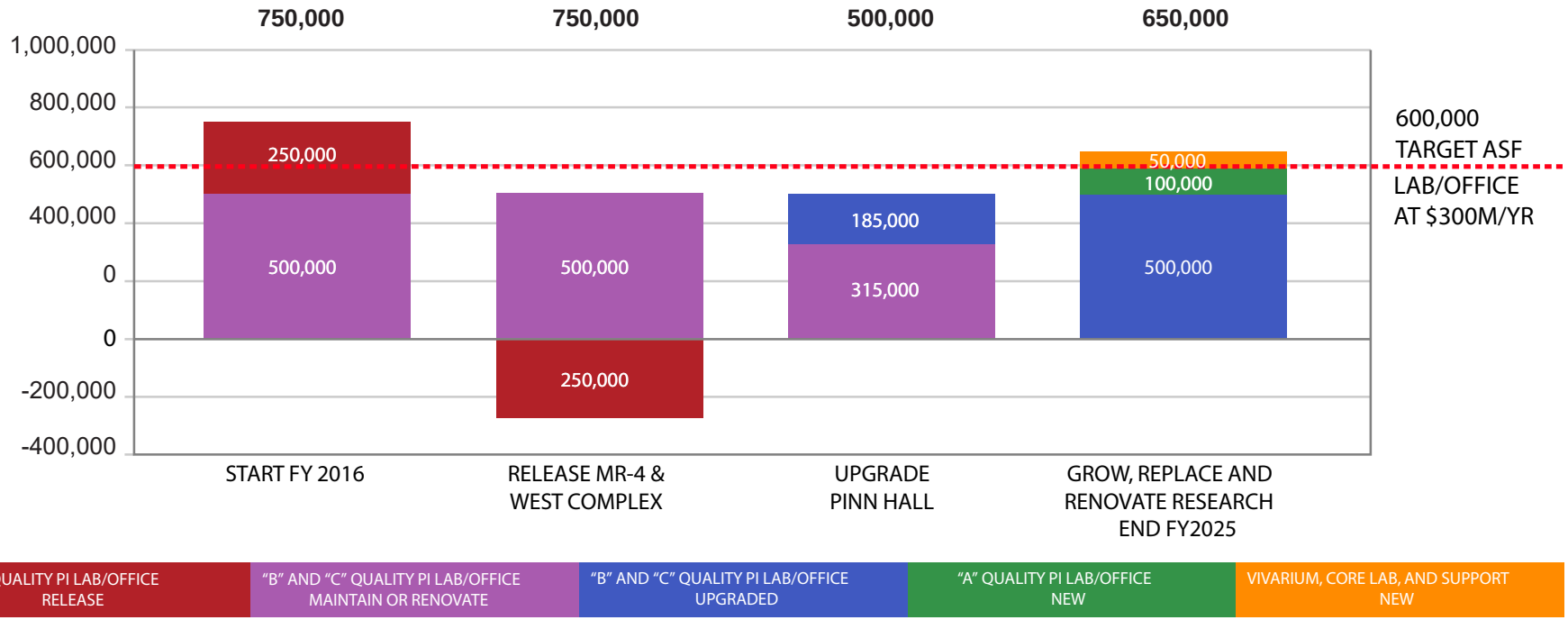
WRITE-UP: 16'

PEOPLE: 4

BENCH: 24'

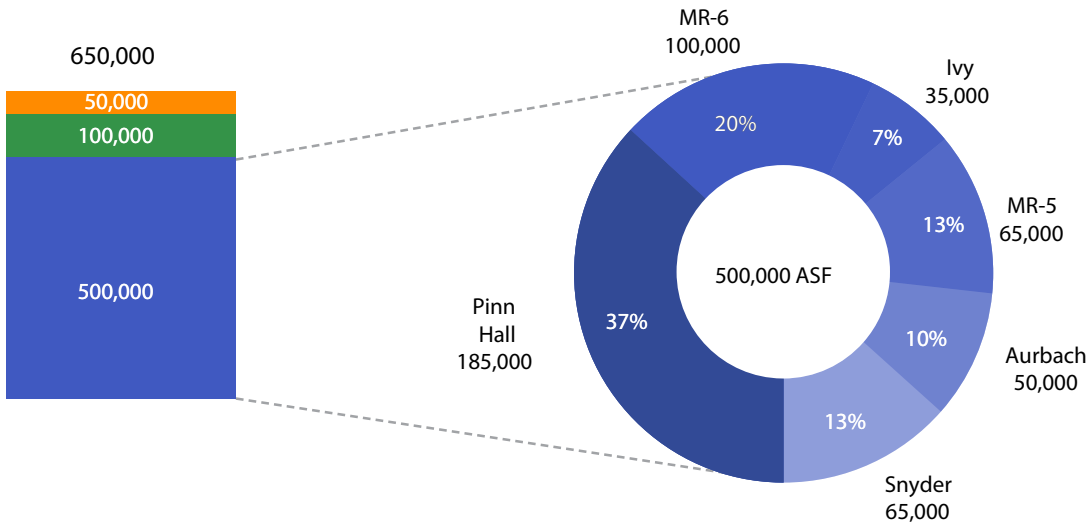
Research Space Strategy

600,000 ASF of Laboratory & Office space are required to accommodate 474 PI's supporting a $300,000,000/year research enterprise. Achieving these targets will require the release, renovation of existing space, and the construction of new space, including the replacement of core facilities.



Research Space Strategy

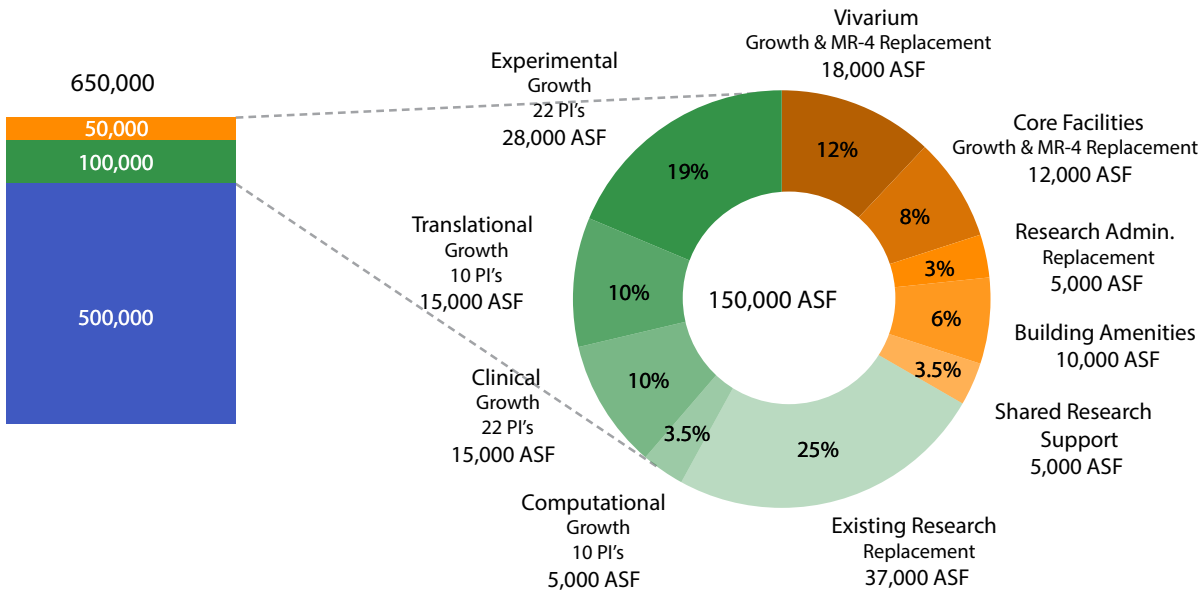
Optimize existing buildings.



JORDAN HALL TO BE RENOVATED	REMAINING PI LAB/OFFICE MAINTAINED OR RENOVATED	"A" QUALITY PI LAB/OFFICE NEW	VIVARIUM, CORE LAB, AND SUPPORT NEW

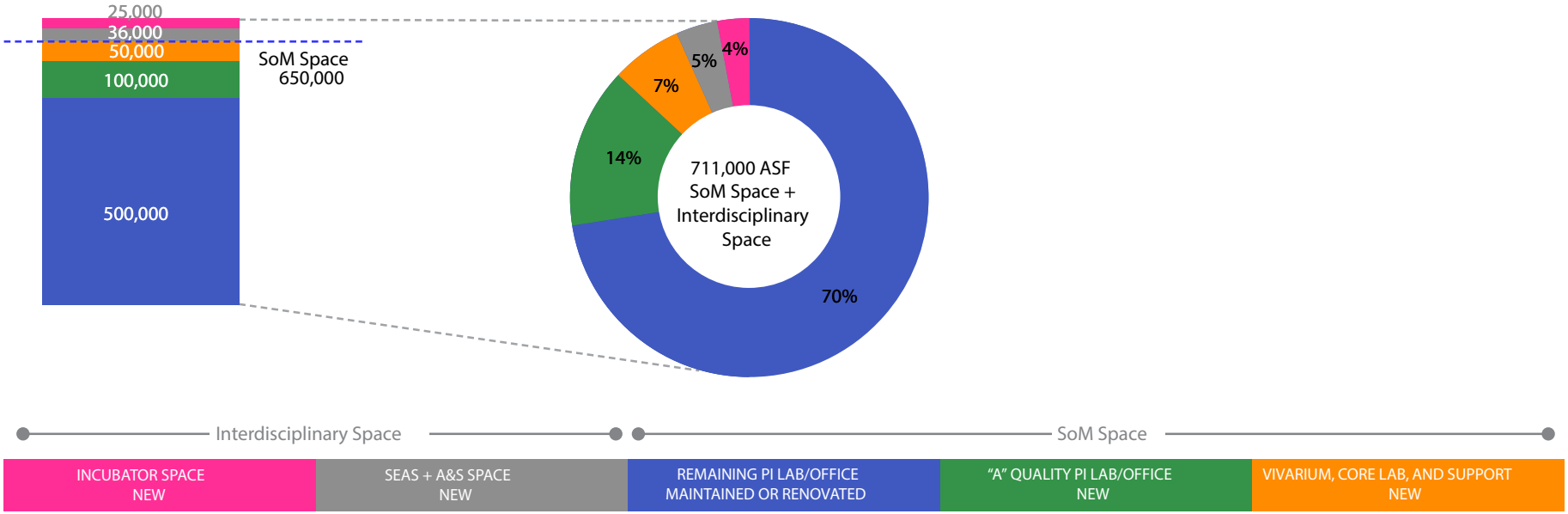
Research Space Strategy

Growth and replacement.



Combined Research Space Strategy

Incubator Space, and SEAS + A&S Space are added to SoM Space needs.



Recommendations

600,000 ASF of Laboratory & Office space are required to accommodate 474 PI's supporting a $300,000,000/year research enterprise.

Achieving these targets will require the release, renovation of existing space, and the construction of new space, including the replacement of core facilities.

Space Needs

- "A"-Quality Laboratory Facilities to enable recruitment of new researchers
- "A"-Quality Vivarium and Core Facilities to support ongoing research & growth
- Collocate core facilities and building amenities (common coffee pot)
- Investment in medical education facilities - flexible classrooms and simulations labs

Renovate

- Pinn Hall (old+new)
- MR-5
- Aurbach
- MR-6

Use existing buildings more efficiently by:

- Developing new research space governance model
- Identifying opportunities to share space, promote synergies & improve collaboration
- Employ highest and best use strategies for each building
- Re-invest in existing inventory through renovation
- Pool resources and build facilities for multiple schools and departments

Potential New Construction:

- Interdisciplinary and Translational Research Building (*Fontaine*)
- Academic Building (*Brandon*)
- Academic & Research Building (*MR-5 Addition*)

MISSION REPORT: EDUCATION

Analysis and Recommendations: Educational Mission

While the clinical and research missions drive the economic performance of the health system, the education of physicians, nurses, and related professionals remains its soul. Recent major investments in the Medical and Nursing Schools have enabled the commencement of transitions in curriculum and have kept University of Virginia competitive for the top 5% of applicants.

The Integrated Space Plan recognizes several ongoing trends: first, that the bar will continue to rise terms of facility capability (e.g., continued increase in simulation laboratory use) and; next, that increasing interdisciplinary programs will require different space in different places and; finally, that CME and GME needs will continue to rise, especially for space embedded in clinical areas.

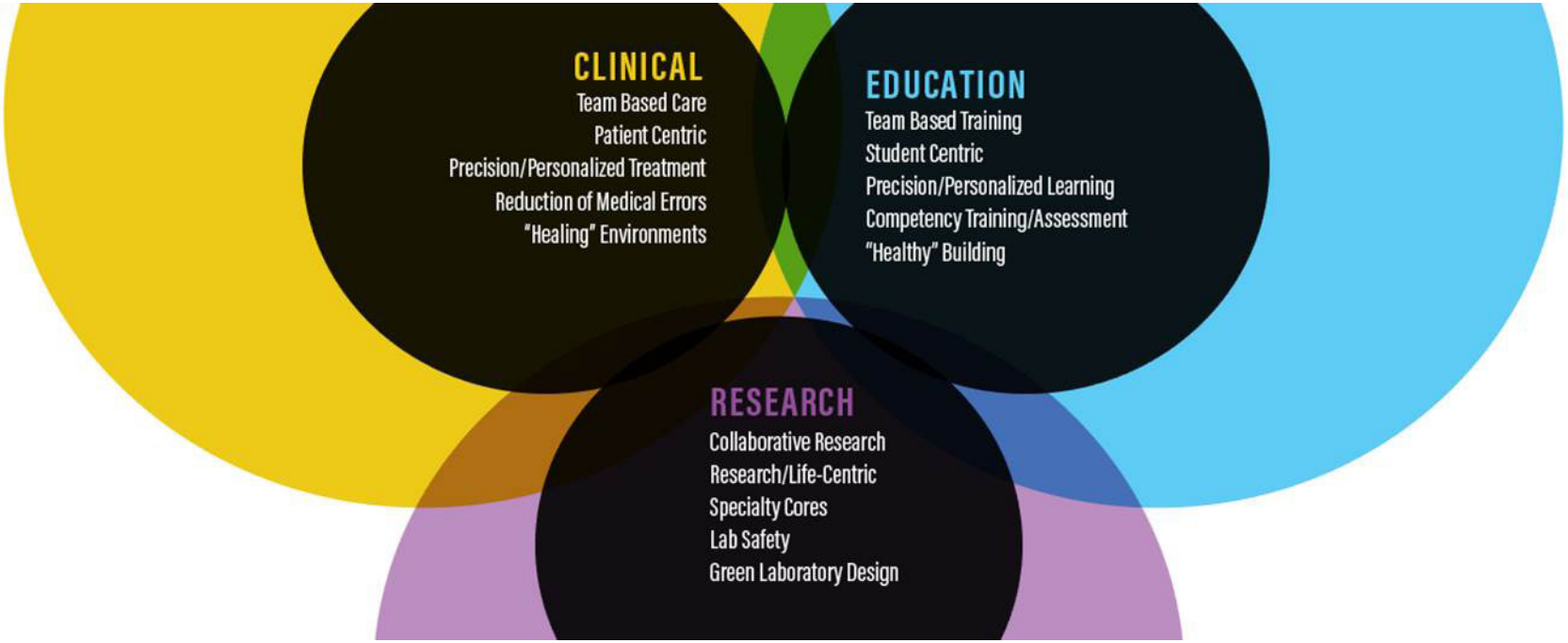
The ISP therefore includes several key investments in educational resources, most notably in adding smaller, flat-floor classrooms where needed and converting sloped-floor rooms for community use. Each of these initiatives will have the effect of freeing space within core educational buildings which can be put to program support.

School of Medicine (Educational) Projects Incorporated in the ISP:

- Completion of the ERC Project at University Hospital (Complete 2017)
- Inclusion of classroom and direct educational support in ongoing hospital, clinic, and research projects, most notably in the redevelopment of space at Fontaine, construction of the ‘Bar’ building, renovations to the library, and renovation of the Primary Care Center (Ongoing, complete 2026)
- Participation in a ‘Provost Initiative’ development at Brandon Initiative (not included in ISP)

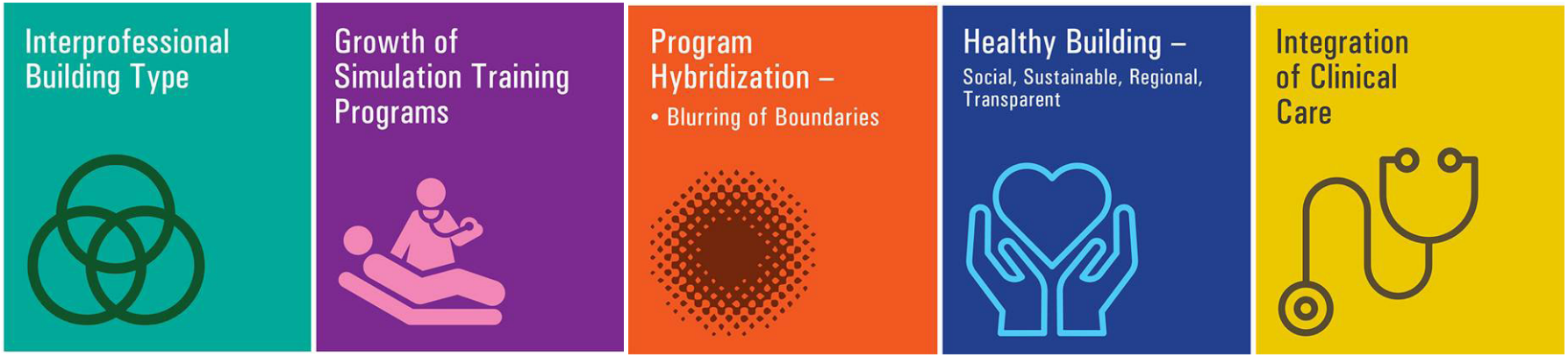
Convergence and Integration

Aim of **Integrated Planning Study** is to integrate three missions of the Health Sciences Enterprise.
Improve Collaboration amongst Educators, Clinicians and Researchers. Maintain competitive edge on National scale.



Educational Trends

Current Conditions at Leading Universities across the country demonstrate grown in Interprofessional Studies, evolution of Simulation Programs, and overall Integration in Program Development, Patient Care, and Physical atmospheres.



Education Space Types

Main Space types used in contemporary Education Programs include Classrooms, Gross Anatomy, Simulation, Library Spaces, Community Space, and Administration and Building Support Spaces.

CLASSROOMS

- Small group rooms
- Classrooms
- Learning studios
- Lecture halls
- Teaching labs

GROSS ANATOMY

- Anatomy lab
- Prep room
- Morgue
- Changing rooms

SIMULATION

- Simulation rooms
- Control rooms
- SP exam rooms
- Classrooms
- Debrief
- Staff offices

LIBRARY

- Study rooms
- Seating areas
- Classrooms
- Terminals
- Reserves
- Stacks
- Staff offices

COMMUNITY SPACE

- Lounges
- Food service
- Kitchenettes
- Lockers/mailboxes
- Lobbies/galleries
- Exterior space
- Student orgs/gov't

ADMIN / SUPPORT

- Faculty offices
- Admin offices
- Conference rooms
- Workrooms

BUILDING SUPPORT

- Lobby
- Housekeeping
- Storage

Education Space Types: Classrooms

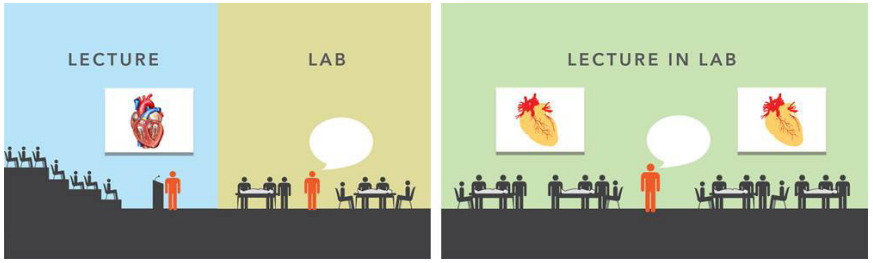
Classrooms: Trends have gravitated **away from tiered lecture halls** and **towards large flexible learning spaces** fully equipped with relevant technology. Learning Spaces should be designed with flexibility to fulfill both the needs of the present and future evolving curriculum.

Large Learning Studio
Claude Moore Medical Education Building
University of Virginia

Scalable Learning Studio
Health Sciences Education Building – Greenville Hospital System
University of South Carolina School of Medicine

Education Space Types: Gross Anatomy

Gross Anatomy: Trends have gravitated **away from separate Lecture and Labs** and **towards integrated learning spaces**. As Digital tools continue to develop, there may be less use of cadavers and more integration of digital anatomy tools.



Gross Anatomy Trends
Lecture/Lab Integration
Digital Anatomy

Gross Anatomy
Paul L. Foster School of Medicine
Texas Tech University Health Sciences Center, El Paso

Education Space Types: Simulation & Clinical Skills

Simulation and Clinical Skills: Utilize Human, Mechanical and Virtual subjects. Range of Simulation Rooms – this curriculum is currently being developed more extensively. Current facilities may fit need but as curriculum develops, may become obsolete.

Simulation Room – Acuity Specific
Collaborative Life Sciences Building
Oregon Health & Sciences University, Portland State University & Oregon State University

De-Brief Room
Health Sciences Education Building, Phoenix Biomedical Campus
University of Arizona & Northern Arizona University

Education Space Types: Library & Community Space

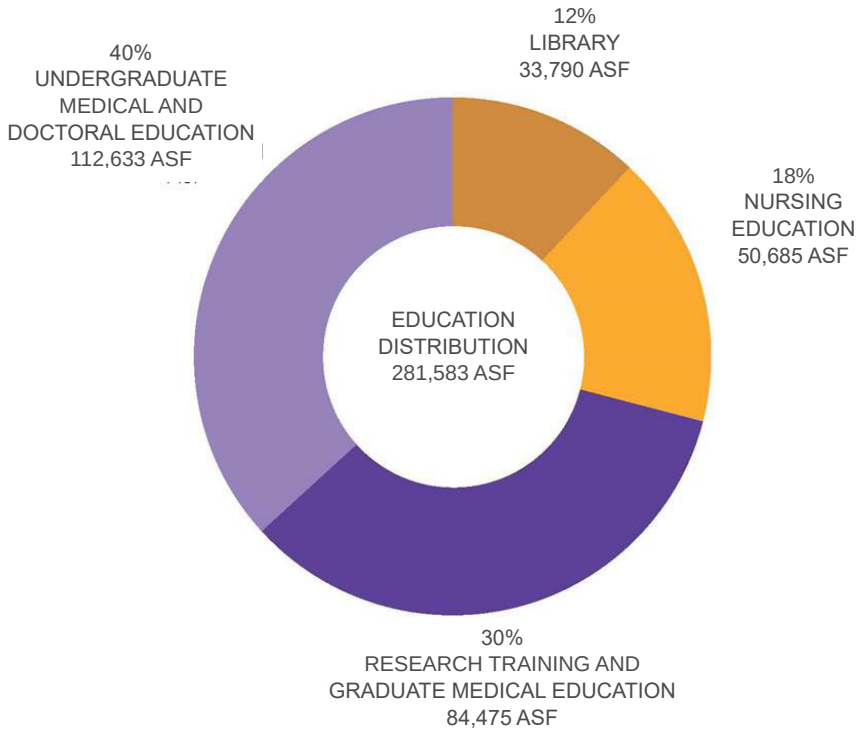
Spaces that allow users to **Socialize**, **Collaborate**, and **Focus**.

Open Lounge Space
Collaborative Life Sciences Building
Oregon Health Sciences University, Portland State University & Oregon State University

Quiet Focus Space
Health Sciences Education Building – Phoenix Biomedical Campus
University of Arizona & Northern Arizona University

Education Distribution

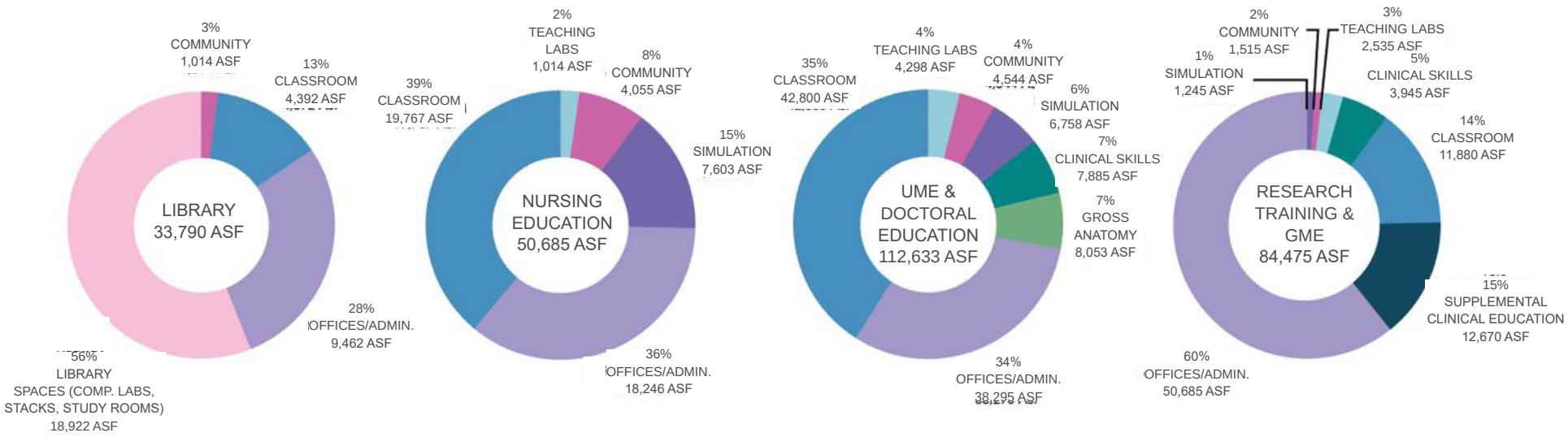
Space distribution amongst different programs. Map shows which buildings have education space according to program. Undergraduate Medical Education and Nursing Education are concentrated in one area, and other programs are dispersed across the Health Sciences Campus. The Library is analyzed separately due to its prominence amongst all programs.



Education Distribution

Breakdown of Education Buckets by Space Type.

Analysis included Offices/Admin space and Community Space (not included in later Blue Sky exercises).



Education Distribution

Breakdown of Education Buckets by Space Type.

Analysis included Offices/Admin space and Community Space (not included in later Blue Sky exercises).

UNDERGRADUATE MEDICAL EDUCATION

- TRADITIONAL M.D. PROGRAM
- INTERDISCIPLINARY PROGRAMS

BUILDING INVENTORY:

- CLAUDE MOORE MED. ED. BUILDING
- JORDAN HALL
- WEST COMPLEX
- MR-5, MR-6

SPACE INVENTORY:

- LECTURE HALLS
- CLASSROOMS
- STUDY ROOMS
- CLASS LABS
- SIMULATION
- CLINICAL SKILLS

GRADUATE MEDICAL EDUCATION

- TRADITIONAL GME PROGRAMS
- INTERNAL MED. RESIDENCY PROGRAM

BUILDING INVENTORY:

- UNIVERSITY HOSPITAL
- JORDAN HALL
- WEST COMPLEX
- MR-4, MR-5, MR-6

SPACE INVENTORY:

- LECTURE HALLS
- CLASSROOMS
- CLINICAL SKILLS

NURSING EDUCATION

- **TRADITIONAL BSN**
- **RN to BSN**
- **MSN PROGRAMS**
  - -Adult Gerontology
    Acute Care
    - Clinical Nurse Leader
    - Nurse Practitioner
  - Family Nurse Practitioner
  - Pediatric Nurse Practitioner
  - Psychiatric - Mental Health
- **Ph. D or DNP**
- **POST DOCTORAL FELLOWSHIPS**
- **CERTIFICATE PROGRAMS**

BUILDING INVENTORY:

- MCLEOD HALL
- CLAUDE MOORE NURSING ED.
- UNIVERSITY HOSPITAL
- JORDAN HALL

SPACE INVENTORY:

- LECTURE HALLS
- CLASSROOMS
- CLASS LABS
- SIMULATION
- CLINICAL SKILLS

DOCTORAL EDUCATION

- BIOMEDICAL SCIENCES GRADUATE PROGRAM (Ph. D)
- M.D./Ph.D. PROGRAM

BUILDING INVENTORY:

- CLAUDE MOORE MED. ED. BUILDING
- JORDAN HALL
- WEST COMPLEX
- MR-5, MR-6
- UNIVERSITY HOSPITAL

SPACE INVENTORY:

- LECTURE HALLS
- CLASSROOMS
- STUDY ROOMS
- CLASS LABS
- SIMULATION
- CLINICAL SKILLS

RESEARCH TRAINING

- BIOMEDICAL SCIENCES GRADUATE STUDIES
- MEDICAL SCIENTIST TRAINING
- M.D./M.S. CLINICAL RESEARCH

BUILDING INVENTORY:

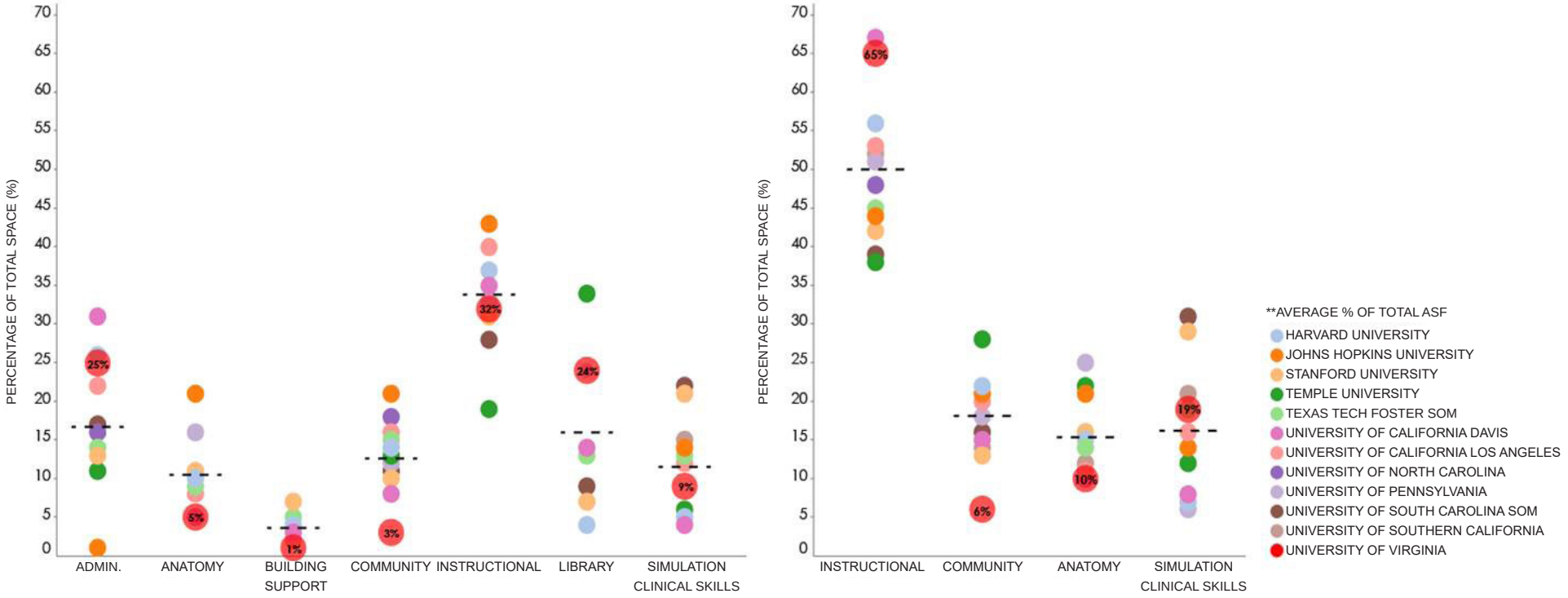
- JORDAN HALL
- WEST COMPLEX
- MR-4, MR-5, MR-6
- UNIVERSITY HOSPITAL

SPACE INVENTORY:

- CLASSROOMS
- CONFERENCE ROOMS
- RESEARCH LABS
- STUDY ROOMS
- ASSEMBLY SPACES

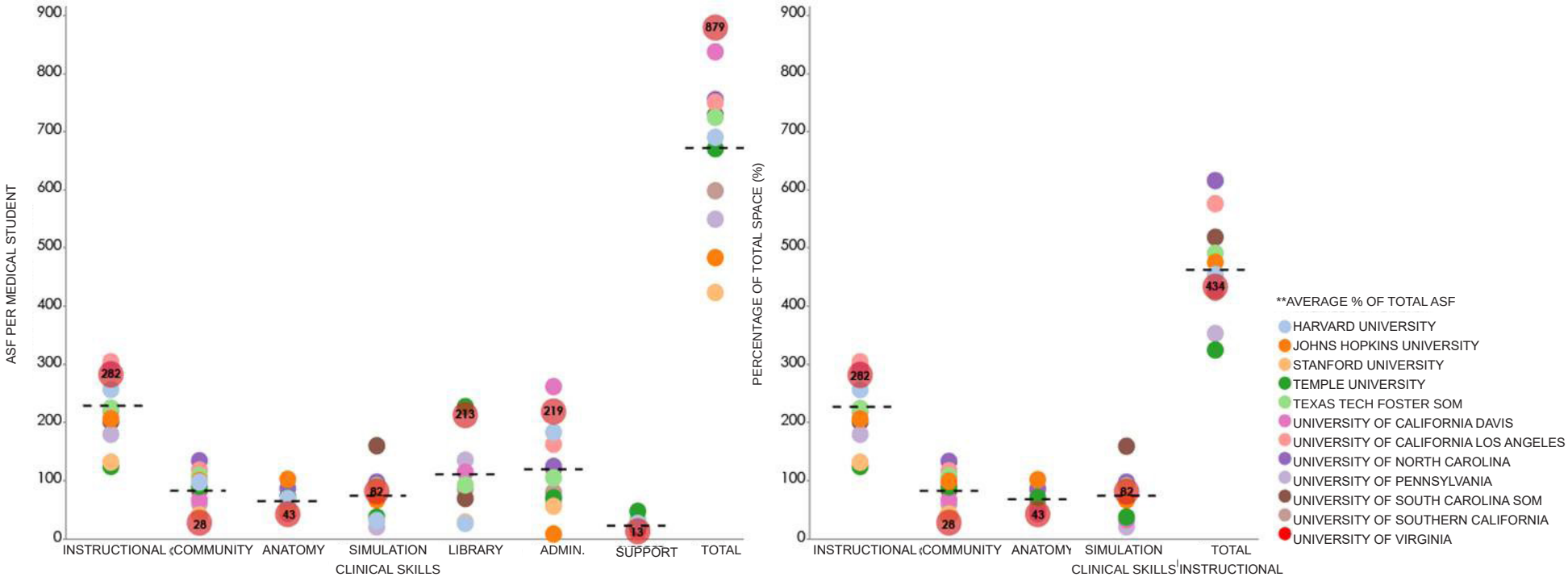
Medical School Benchmarks: Space

When comparing UVa to other Universities, the Administration and Library space is far above average. However, many of the other spaces fall below the average. Diagrams show all Inventory and only Instructional Inventory.



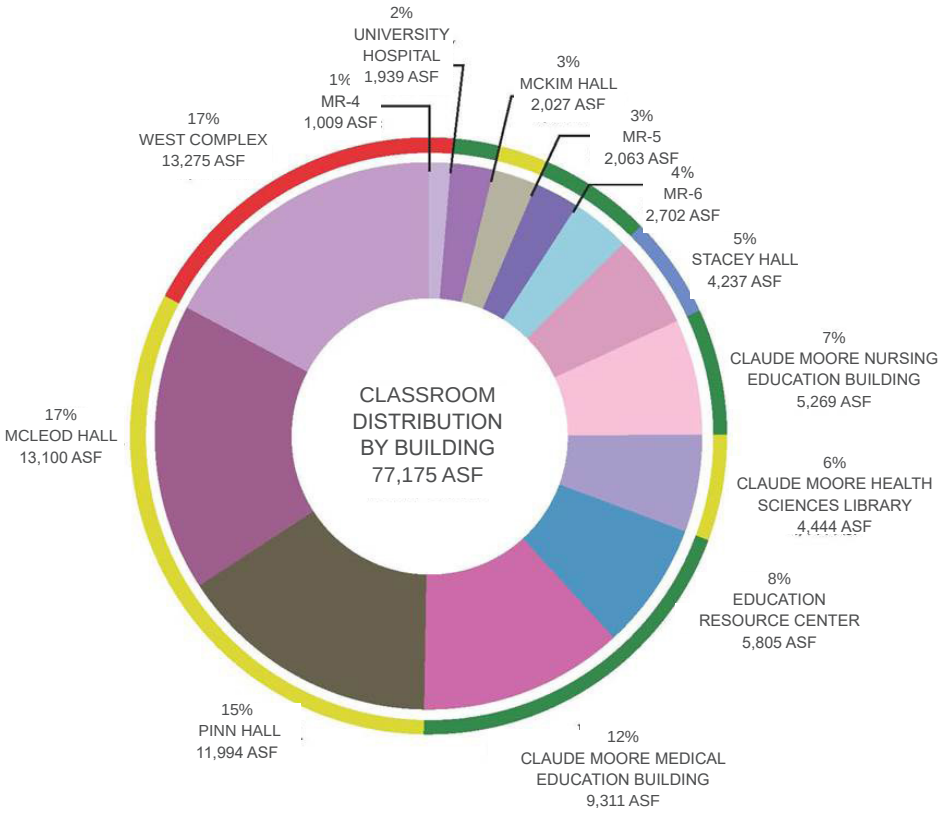
Medical School Benchmarks: ASF/Student

When analyzing the ASF per student, UVa has far more than the average amongst other Universities. However, when looking at Instructional space alone, UVa falls just short of the average.



Classroom Distribution and Quality

The classroom is the building block of instructional space. This analysis identifies different types of classrooms across campus. Largest teaching spaces are located in “B” and “C” quality space – West Complex, McLeod Hall, and Pinn Hall. There is also good quality teaching space located in Claude Moore Medical Education Building, Education Resource Center (to be opened this year), and Claude Moore Nursing Education Building.



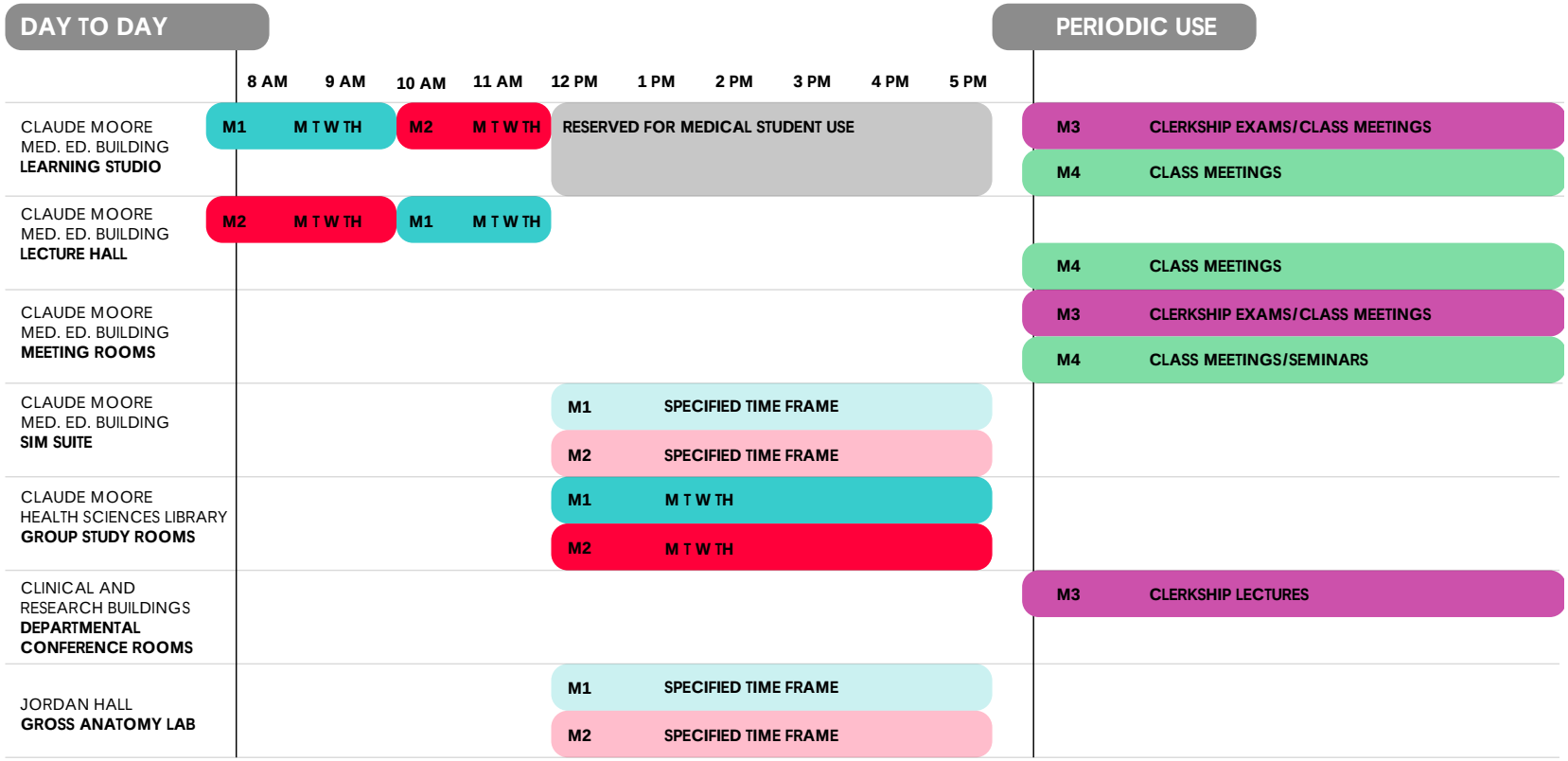
Case Study: Day to Day (UME) Space Use Analysis

Case study to analyze how current inventory is used (specifically by UME).

Identifies Learning Studio as the most highly utilized space in UME Inventory, other spaces are only used some of the time and demonstrate opportunity to share space.

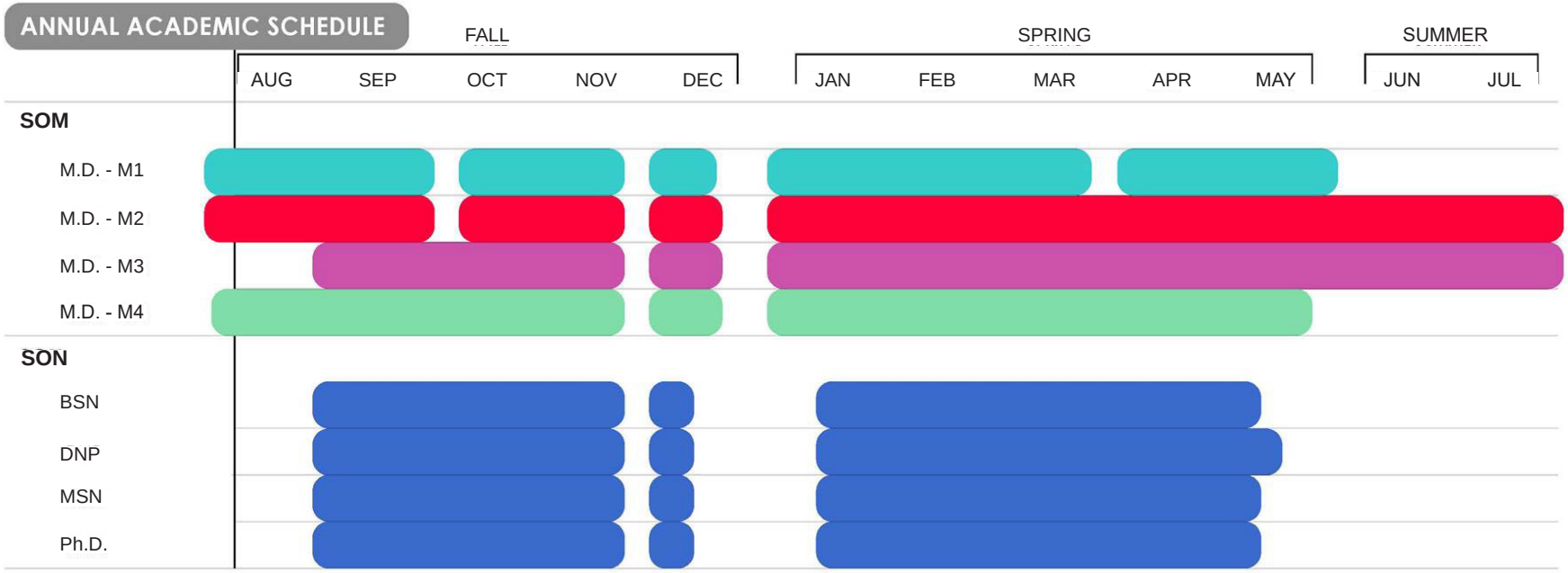
Learning Studio has high level of efficiency.

Other instructional spaces are only used by UME part of time. These spaces are opportunities to share with other programs.



Case Study: Academic Schedules (UME & SON) Space Use Analysis

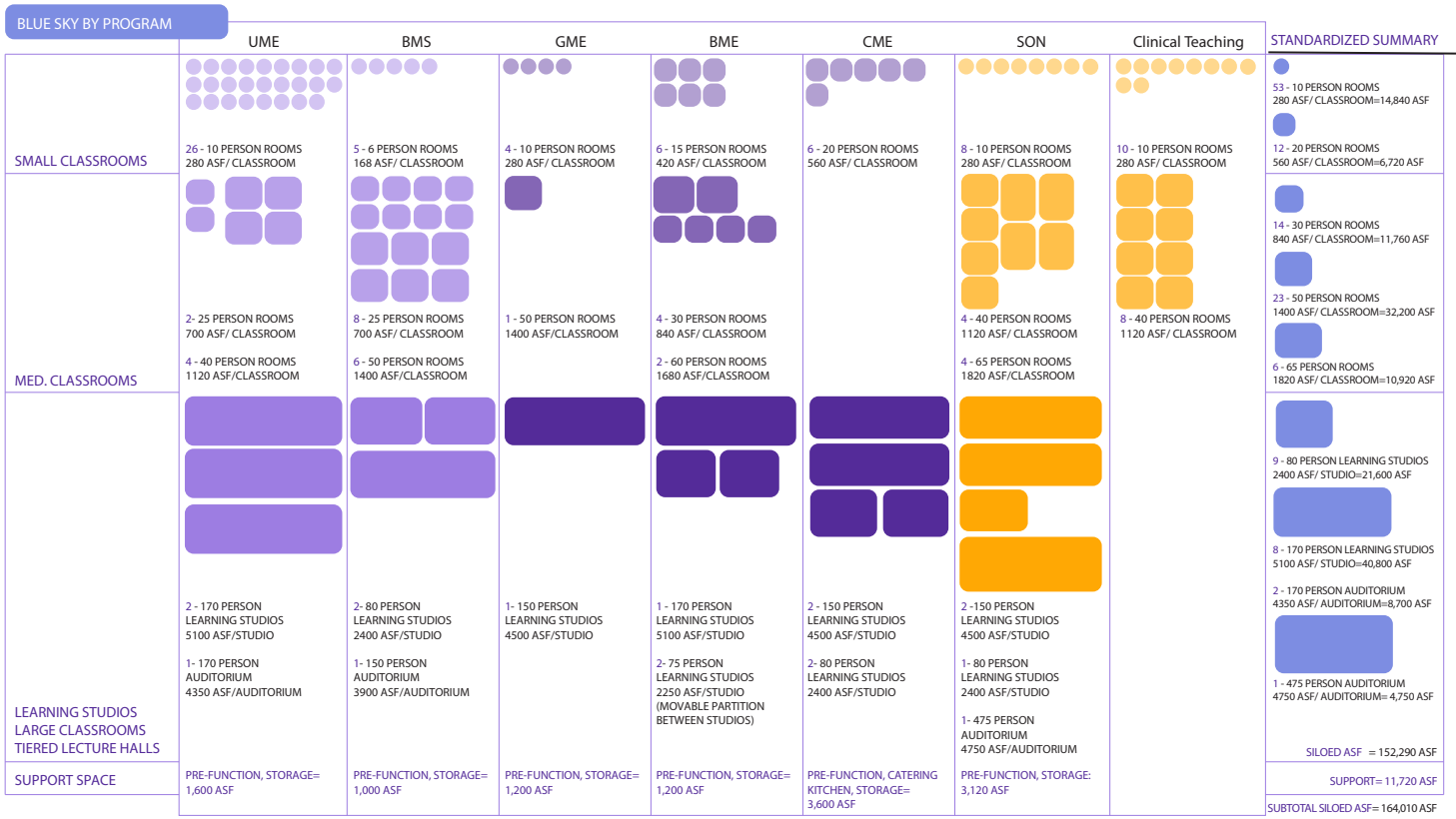
Different programs are in session at different times of the year. UME tends to use space throughout the year whereas SON follows a traditional Academic Calendar. This means SON spaces are free for use during summer months.



Blue Sky Program: Ideal Siloed Needs

Analysis of Ideal Needs – Unconstrained by Current Inventory

Small Classrooms, Medium Classrooms, Learning Studios, Large Classrooms, Tiered Lecture Halls



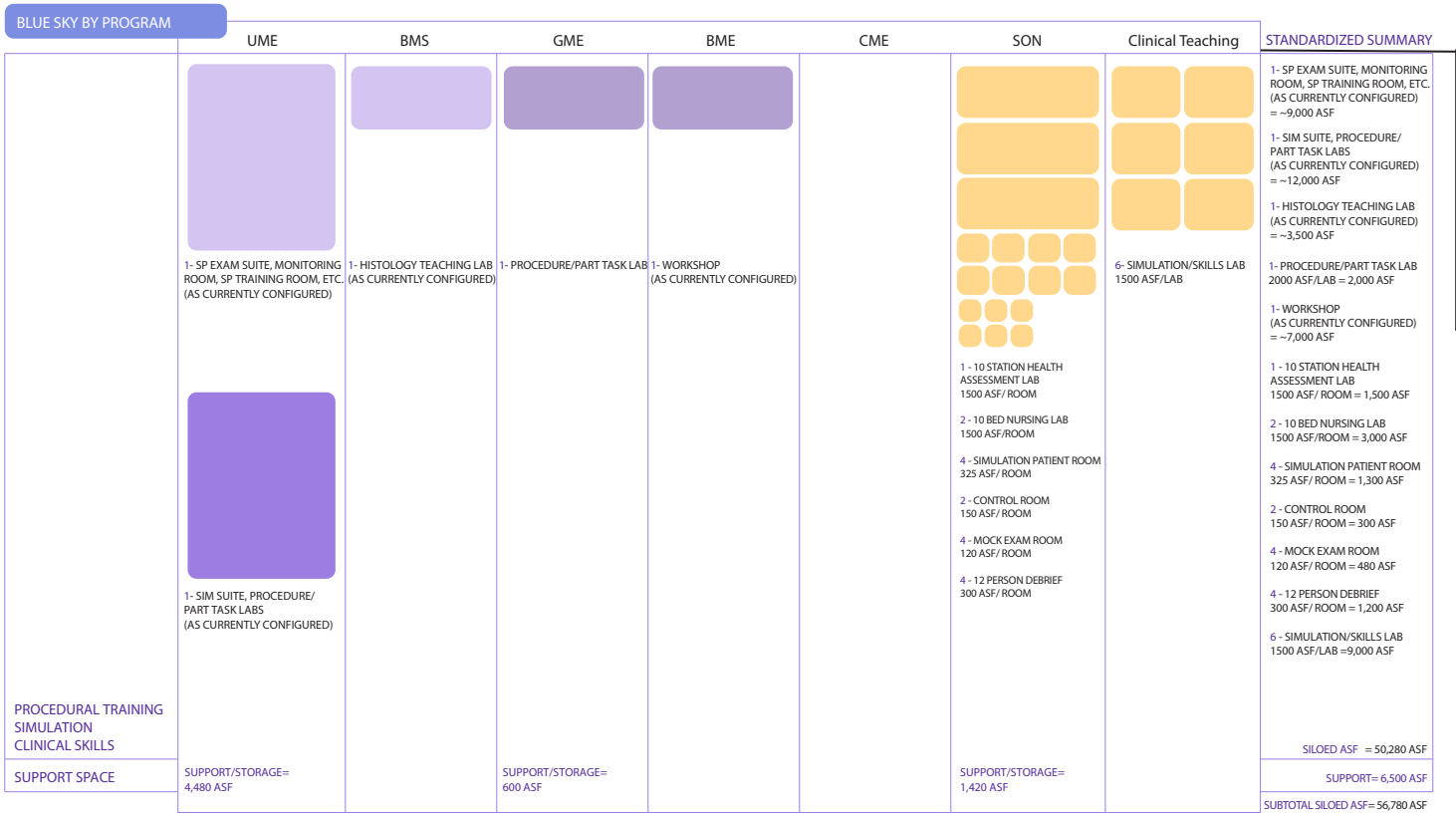
Ideal Classroom needs
This analysis does not consider location, current inventory, or shared opportunities.

High demand for small rooms and large spaces.

Blue Sky Program: Ideal Siloed Needs

Analysis of Ideal Needs – Unconstrained by Current Inventory

Procedural Training, Simulation, Clinical Skills

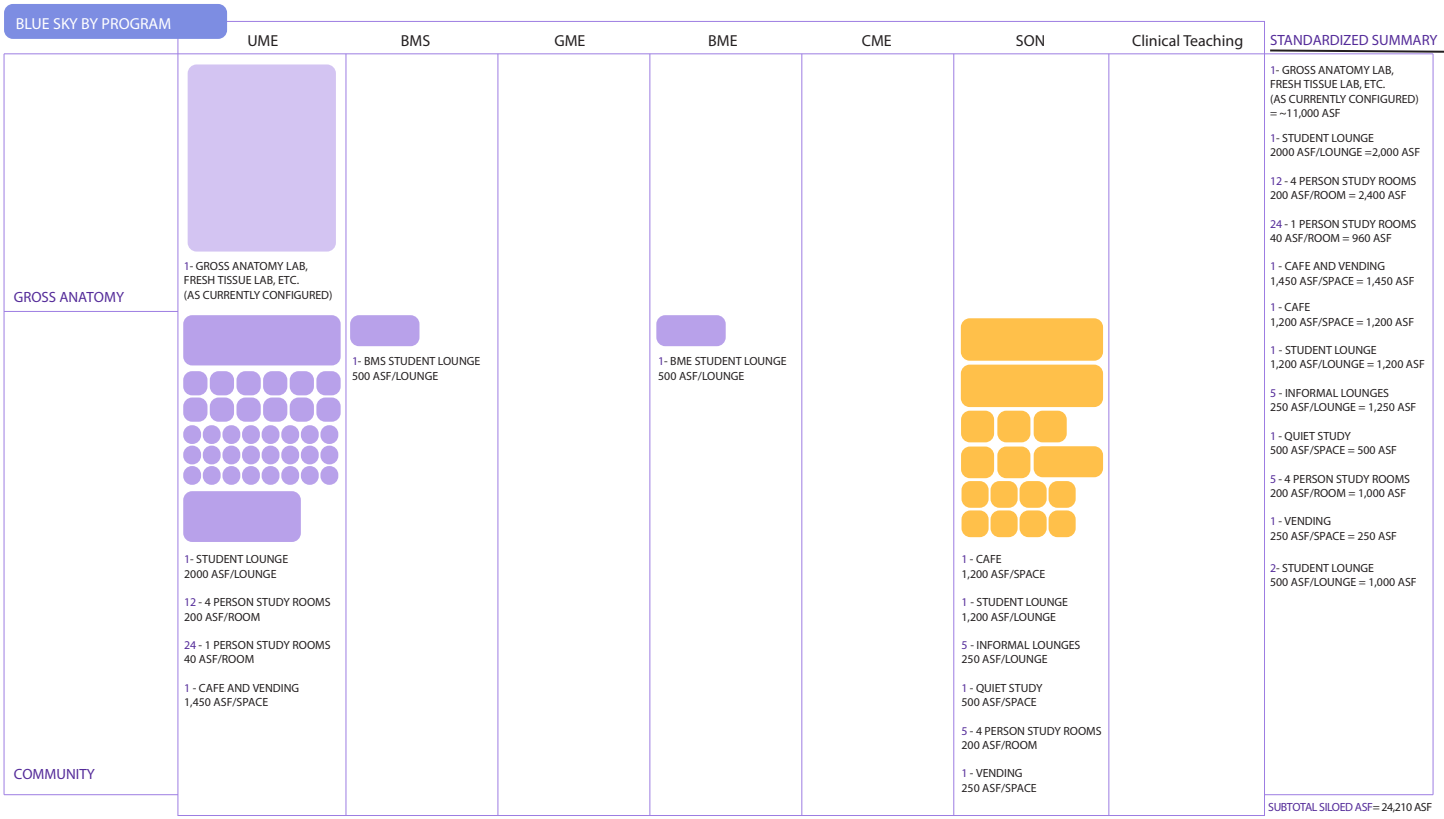


As Simulation and Clinical Skills Curriculum evolves, there is a greater need for updated facilities.

Blue Sky Program: Ideal Siloed Needs

Analysis of Ideal Needs – Unconstrained by Current Inventory

Gross Anatomy Labs, Community Space



Community needs are specific to programs. There are additional Community space needs that are not accounted for in this study (meant for all to utilize).

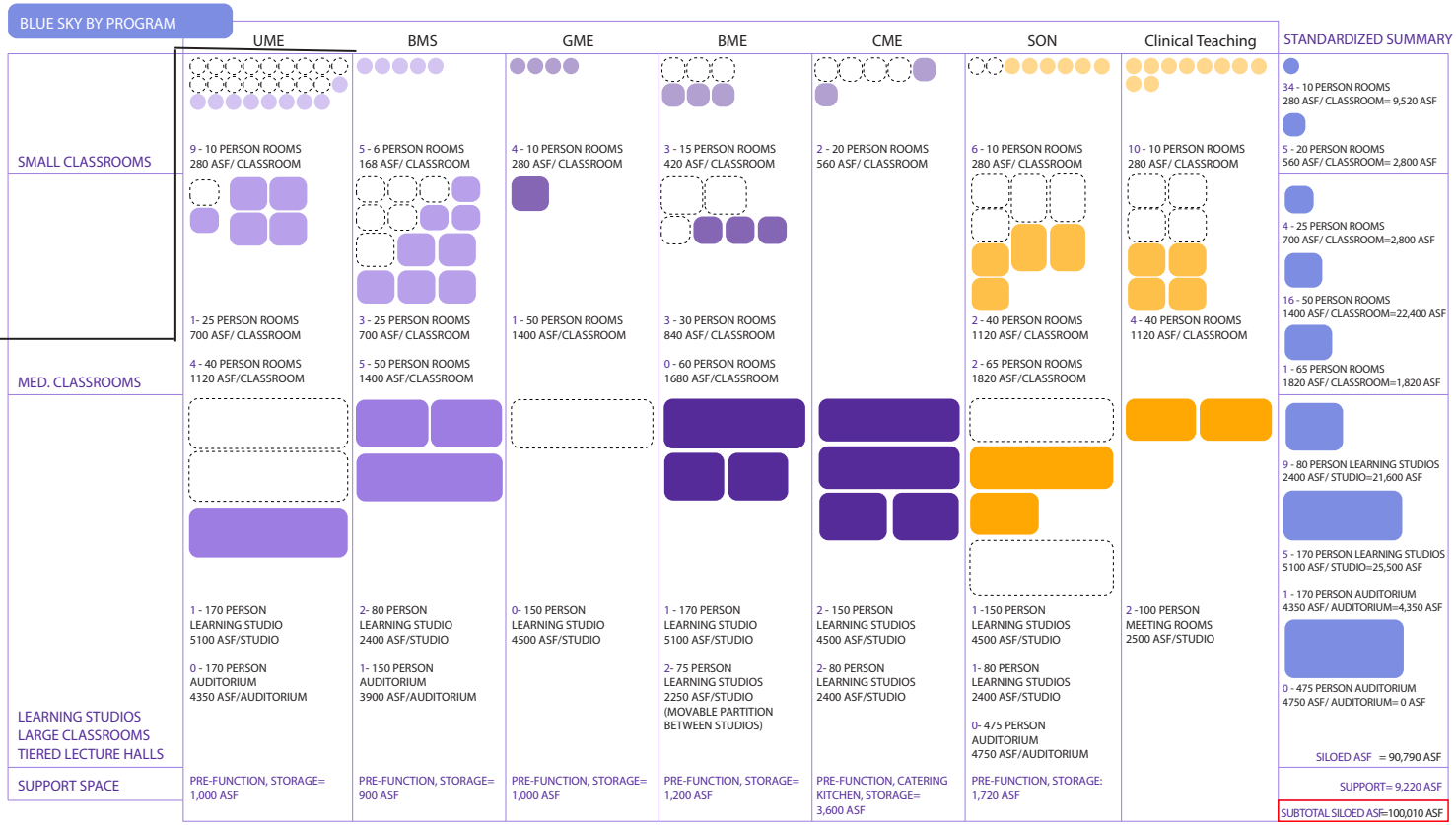
Blue Sky Program: Ideal Siloed Needs *with* Current Inventory

Identifies which needs are fulfilled by current space – see dashed lines.

Greatest need across all programs is for large spaces (ex: Learning Studios), and small group rooms.

All dashed squares represent space needs that are currently fulfilled by existing instructional space.

For ex: For UME. Needs for Lecture Hall and Learning Studio are already fulfilled by two rooms in Claude Moore Medical Education Building.

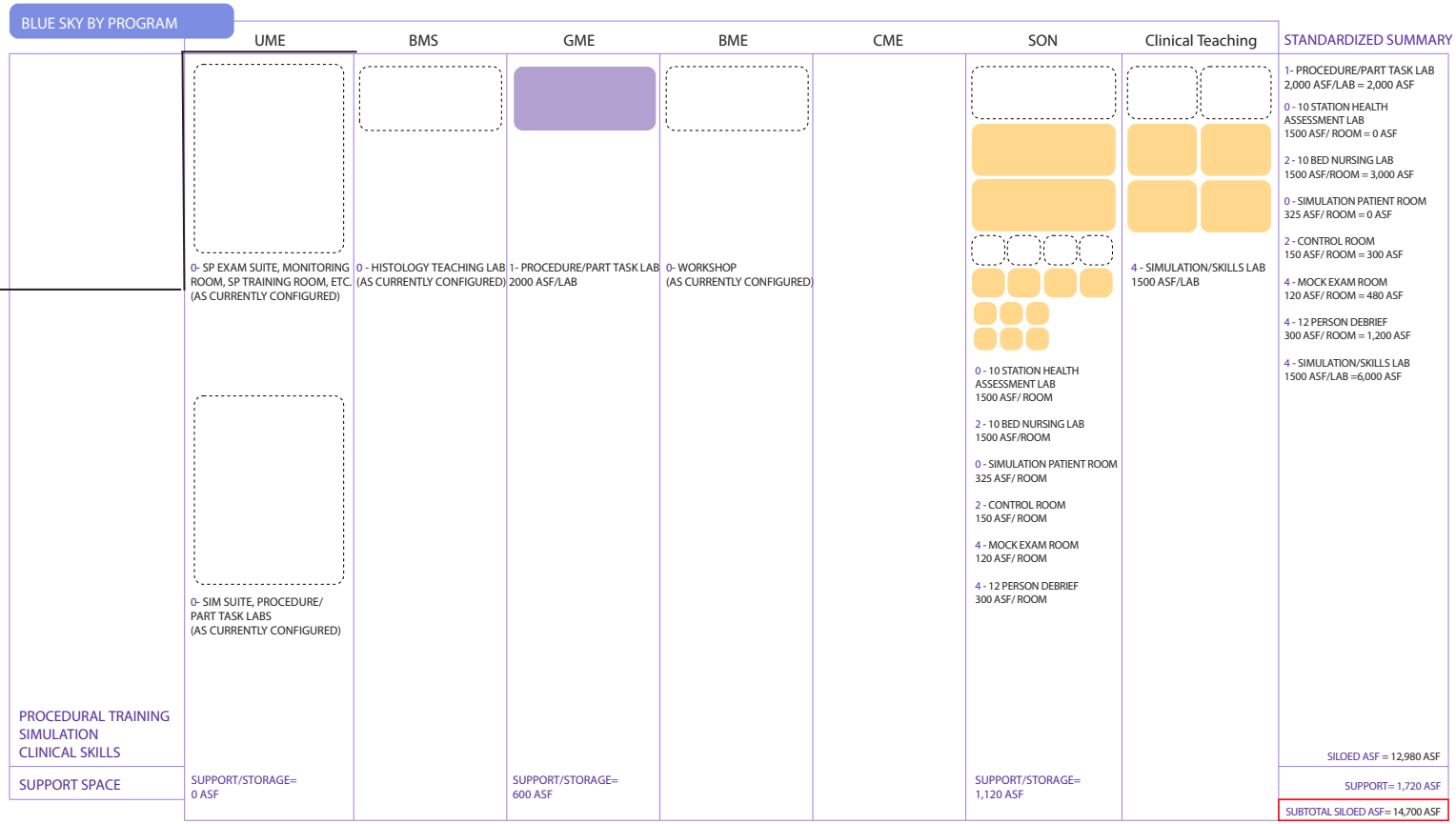


Blue Sky Program: Ideal Siloed Needs *with* Current Inventory

Identifies which needs are fulfilled by current space – see dashed lines.
Most Procedural Training, Simulation, Clinical Skills needs are currently fulfilled.
As SoN Simulation curriculum grows, greater need for Simulation spaces.

Most of Lab needs are currently fulfilled by existing inventory.

SON still has Simulation needs – this might mean an upgrade, additional space, or better access to existing facilities (as found in Claude Moore Medical Education Building)

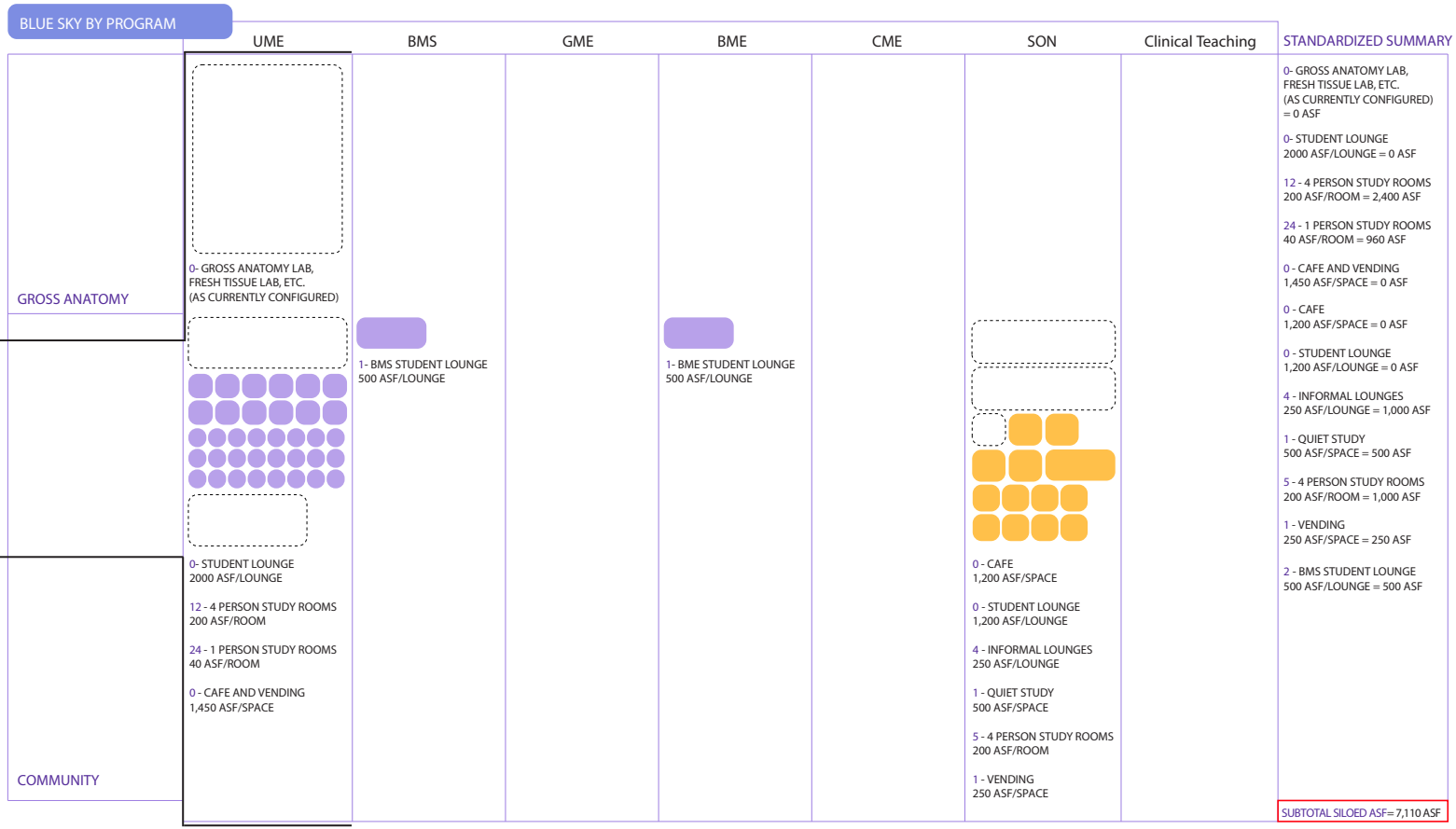


Blue Sky Program: Ideal Siloed Needs *with* Current Inventory

Identified which needs are fulfilled by current space – see dashed lines.
Designated Community space isn't necessary for most programs.
*Need for interdisciplinary Community space is not shown here.

Gross Anatomy Lab is sufficient for time being. As curriculum evolves, cadavers may be replaced by new technology.

Siloed community space needs are mostly composed of Study Rooms.

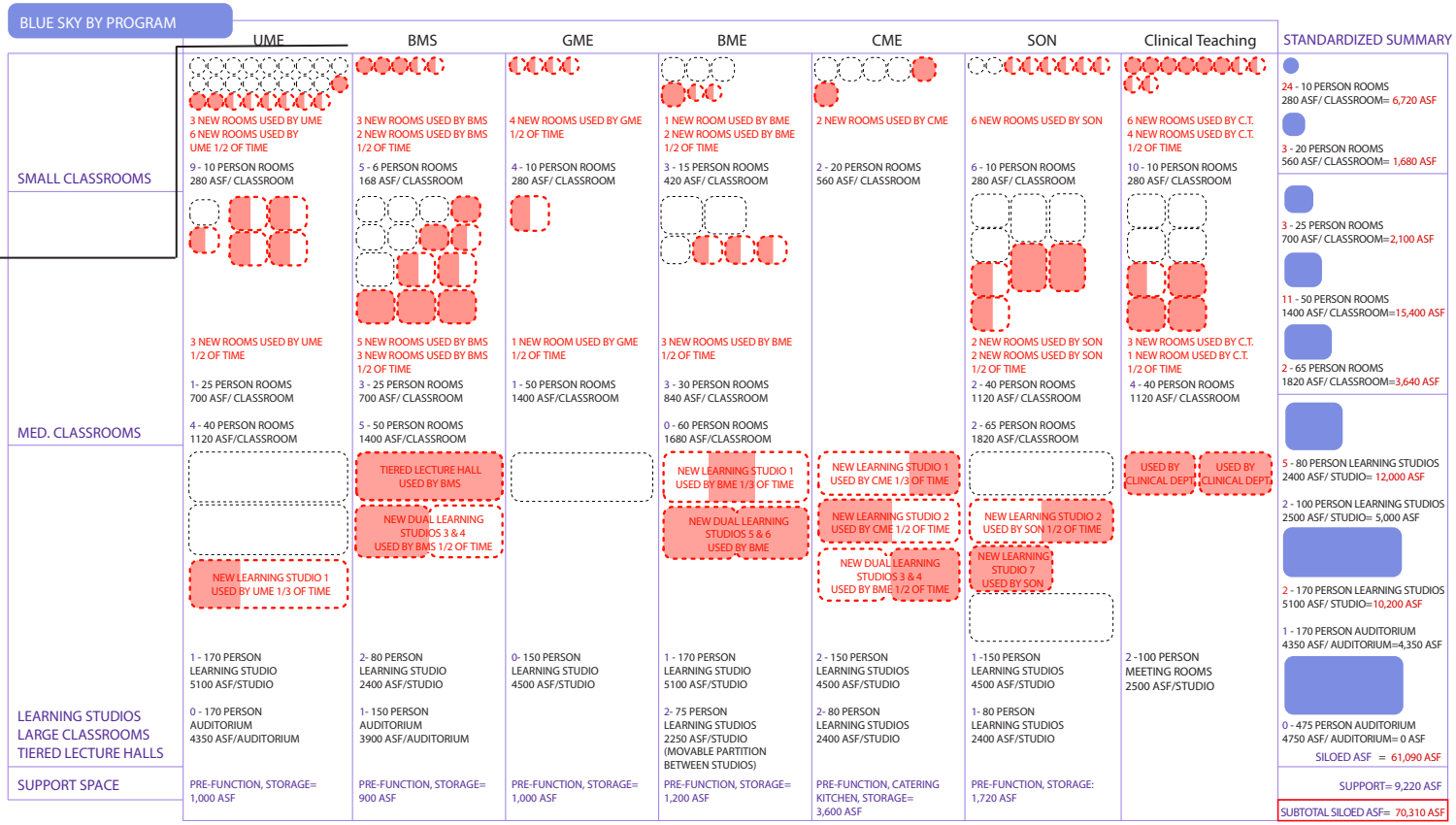


Blue Sky Program: Analysis of Shared Opportunities

Identifies shared opportunities by analyzing Program locations.

Need for large Learning Studios is cut down from 5 to 2.

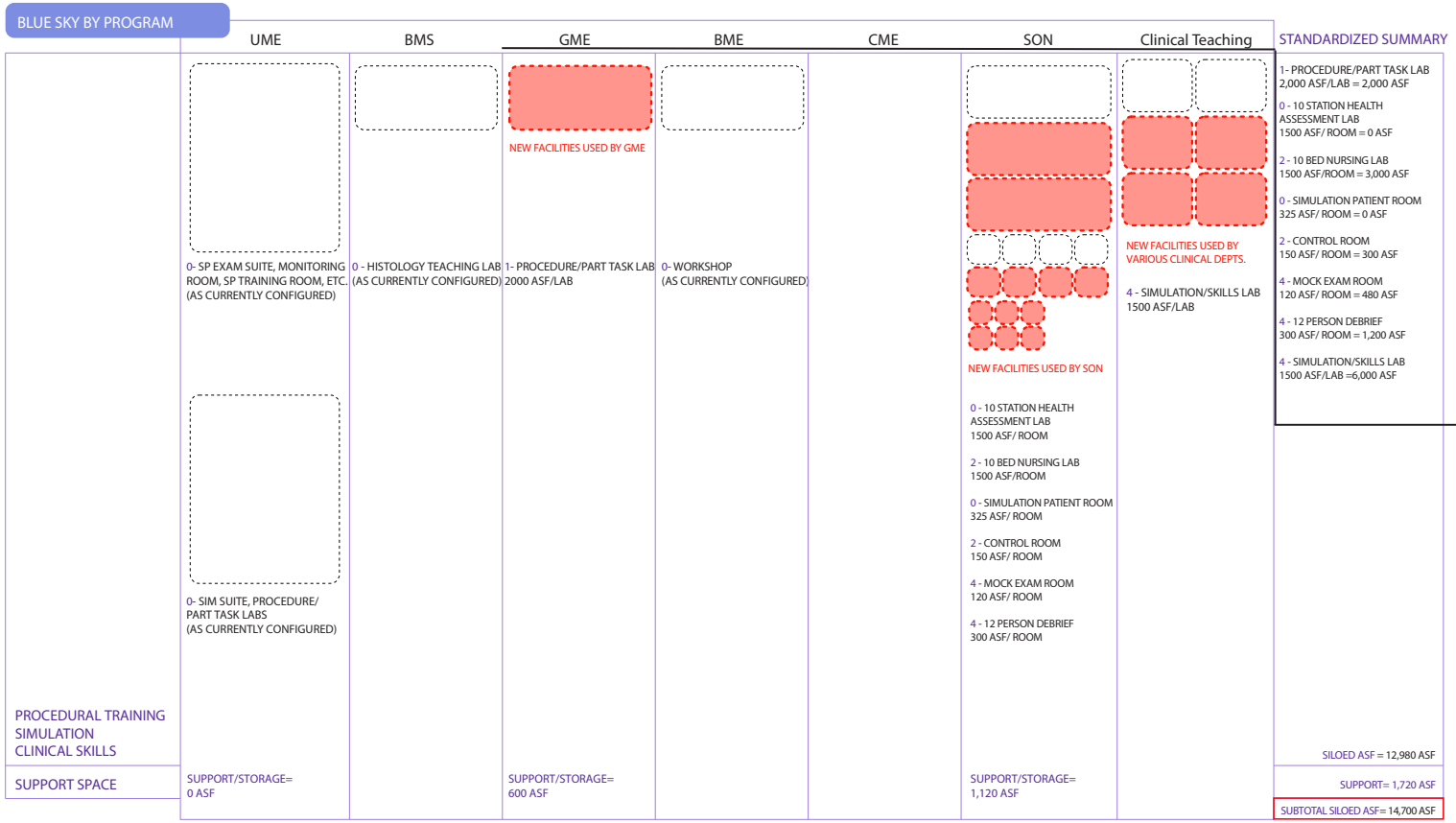
Red shading shows opportunities for sharing. While some programs need dedicated space for regular use, other programs only need dedicated space during certain times of the week and day – this leaves additional time when those spaces are unused and can fulfill needs of other programs.



Blue Sky Program: Analysis of Shared Opportunities

Identifies shared opportunities by analyzing Program locations.

Less sharing opportunities in Procedural Training, Simulation, and Clinical Skills Instructional Spaces.



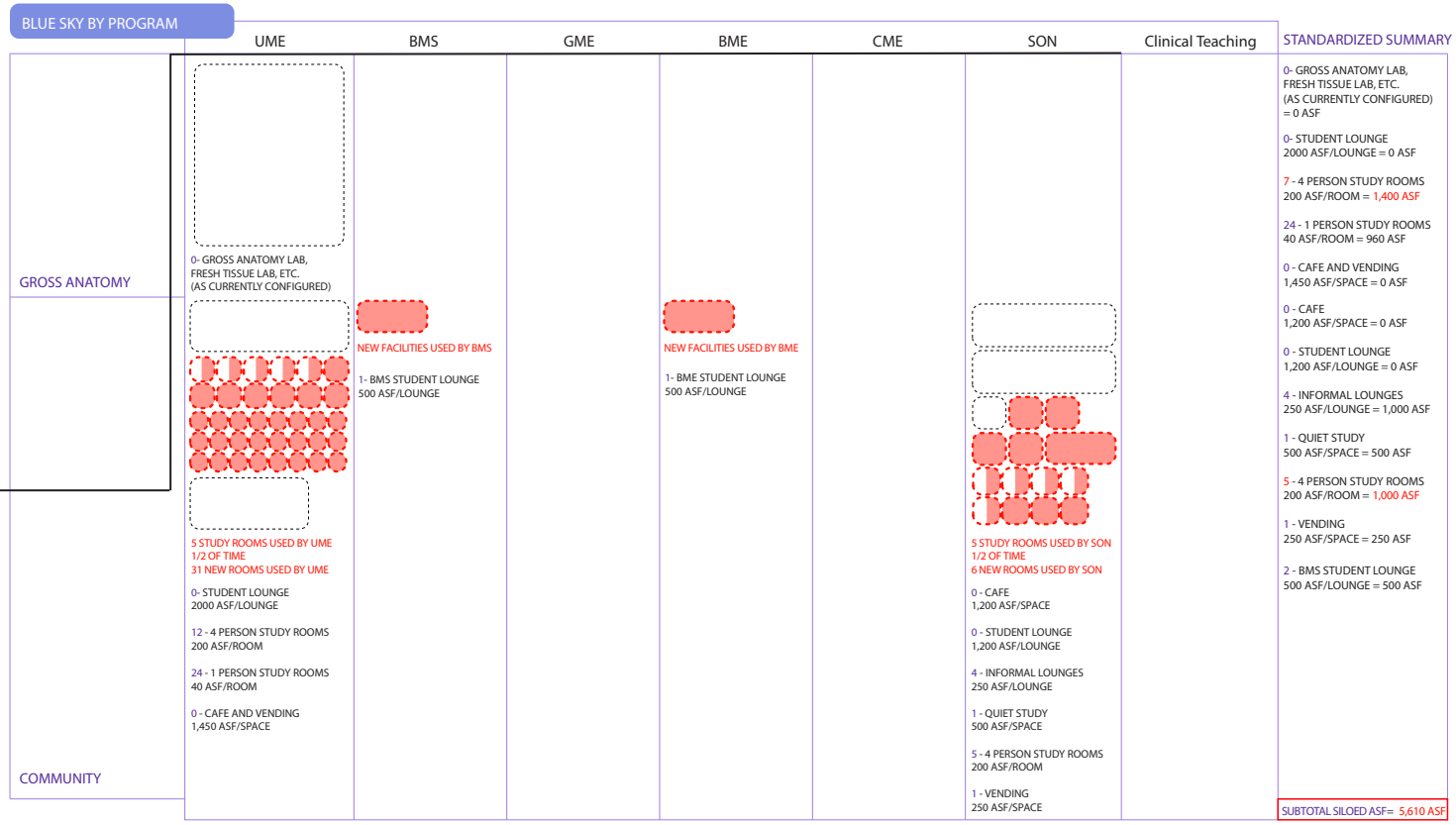
Due to geographic constraints, it may be necessary for lab space needs to remain siloed.

However, if future projects allow for better accessibility by all programs, there may be sharing opportunities.

Blue Sky Program: Analysis of Shared Opportunities

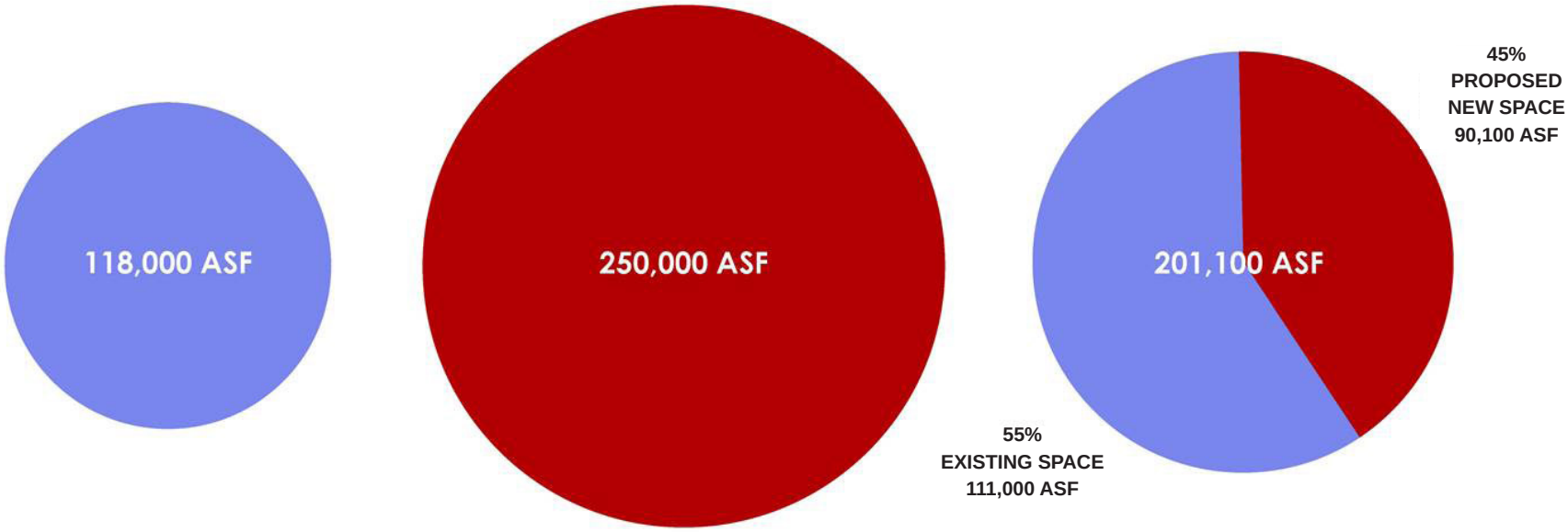
Identifies shared opportunities by analyzing Program locations.

While study rooms can be shared. Some programs have requested designated community space (lounges) for the students to interact with peers of same program.



Education Space Strategy: Existing/Blue Sky/Projected

Results of Blue Sky Exercise.
Composed of Instructional Space, Simulation/Clinical Skills, and Community Space.
(Excludes Office and Support Space).



EXISTING INVENTORY

Instructional Space comprised of Classrooms (all sizes), Teaching Labs (Gross Anatomy, Part Task, etc.), Simulation and Clinical Skills Labs , Academic Community Space

BLUE SKY INVENTORY

Siloed Needs

PROJECTED INVENTORY

Existing Space that fulfills needs **and** Proposed New Space considers:

1. Existing Space in good condition
2. Geographic Constraints
3. Opportunities to share

*** CALCULATIONS EXCLUDE OFFICE/ADMIN. AND SUPPORT SPACE**

MISSION REPORT: OFFICE AND ADMINISTRATION

Analysis and Recommendations: Administrative Office Space

Almost 40% of Health System space – over 1 million square feet – is office space. These spaces support the operation of the Medical Center, house faculty with academic and research duties, and otherwise support the operations of the Health System. Little of this space is ever visited by patients or visitors and, like many Academic Medical Centers, it has mostly been consigned to the oldest buildings and spaces which have otherwise outlived their usefulness.

The Integrated Space Plan recognizes that not only are the highly dispersed, solo office model spaces an inefficient use of space and not supportive of ongoing organizational initiatives, they no longer reflect or support the work of a modern academic medical center. By the end of the planning horizon for Integrated Space Planning, most administrative space will have been impacted through relocation, redevelopment, and abandonment of these poor performing buildings. The section which follows outlines a simple set of guidelines to effect transition to office space which – first and foremost – better supports the work including development of mobile touchdown offices, interdisciplinary huddle spaces and other needs which managing the overall footprint into a smaller size in support of the lean organization.

Key to implementation of these recommendations will be adoption of similar guidelines for information technology access and other cross-organization needs for simplification and sharing of supportive infrastructure.

Office/Administration Space Trends

As the workplace evolves, it will be important to adjust the private office and adjacent spaces to meet the future demands of work flow. Private workspaces will be expanded to include touch down space and open workstations in an effort to create variety in the workplace and encourage users to self-select their best working environment. Designated space will be sized based on the needs of the users.

The **Private Office** still plays an important role in the workplace. It's form has evolved to fit the needs of a new office culture.

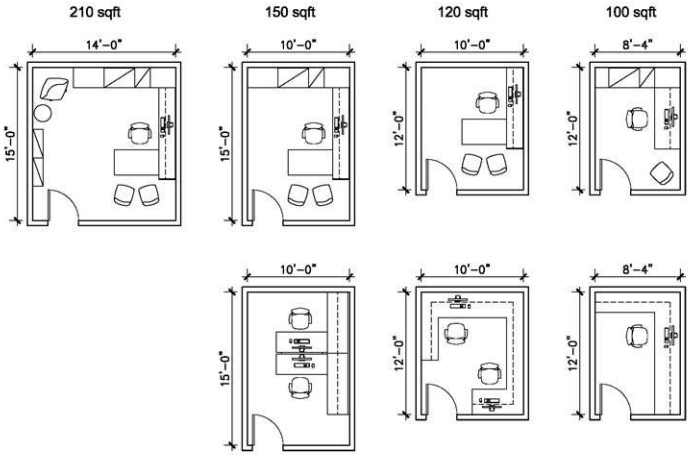
Offices and workspaces will be adjusted to fit the needs of the **users**. Size responds to the function the office serves.

Collaboration plays greater role in modern workplace practices. Important to provide ample **shared space** in addition to the **private office** and **workspace**.

In the past, office size has reflected position. In current practices, it's important to analyze **utilization** and **work flow** to create spaces that serve their users.

Office/Administration Space Trends: Private Space Concepts

The Private Office will continue to have an important role in the workplace. It will be necessary to right size these spaces to accommodate the users more effectively and provide additional community space that will encourage users to collaborate with their colleagues.

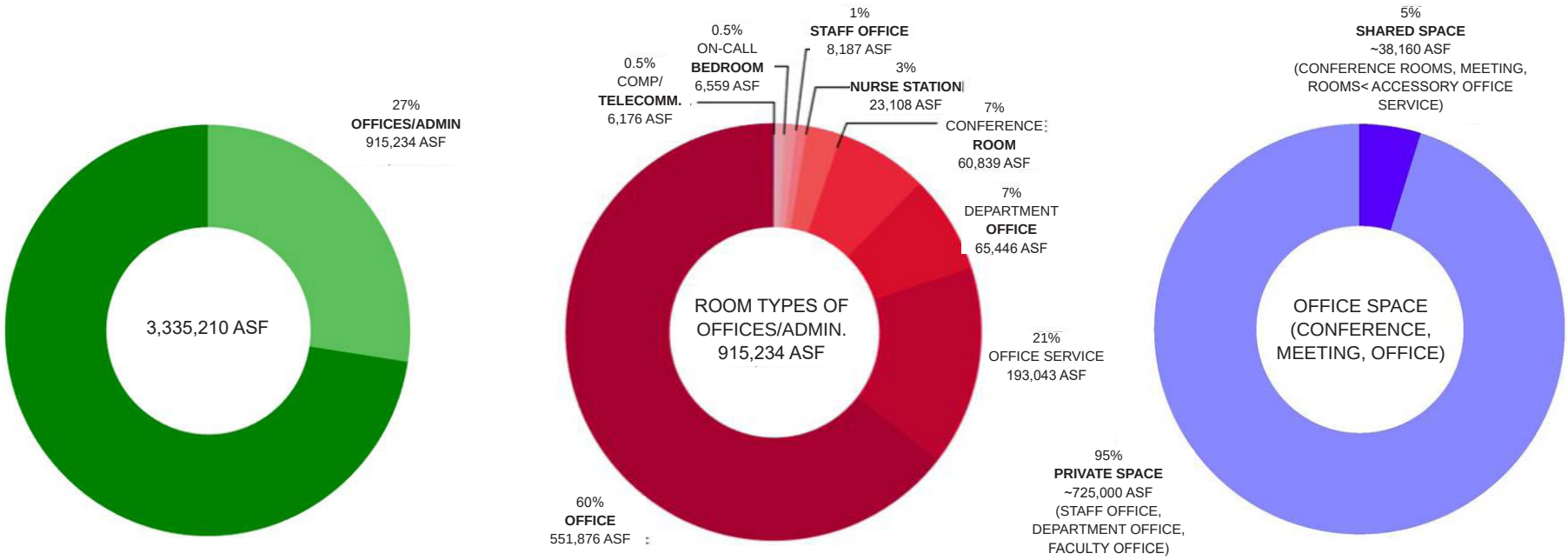


Office/Administration Space Trends: Shared Space Concepts

Office and Administration space will be reconfigured to incorporate open workstations and additional community space. These space may serve as areas of respite, quiet lounges, and eating spaces.

Office/Administration Inventory

Office/Administration space composes about ¼ of the total Health Enterprise. This space encompasses Private and Shared work space. However, the current ratio of Private to Shared space, shows an overwhelming 95% of inventory dedicated to the private office.



Office Distribution by Building and Building Grade

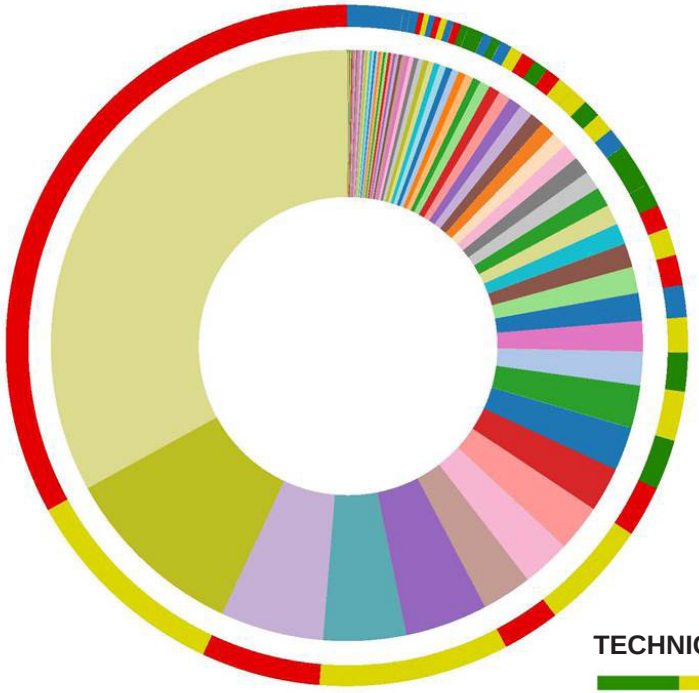
Majority of offices are located in buildings with Functional Grades of B or C.

There are some offices in A Grade space but they are not plentiful. In fact, only 14% of offices are in A grade space.

Source: AEI and Facilities Report, UVA Database.

- WEST COMPLEX: 1684 OFFICES
- UNIV. HOSPITAL: 513 OFFICES
- MCKIM HALL: 288 OFFICES
- RAY C. HUNT 500: 230 OFFICES
- PINN HALL: 230 OFFICES
- MR-4: 139 OFFICES
- RAY C. HUNT 400: 136 OFFICES
- LEWIS & CLARK DR.: 131 OFFICES
- JPA BUILDING: 124 OFFICES
- MR-5: 121 OFFICES
- PCC: 120 OFFICES
- MR-6: 94 OFFICES
- NORTHRIDGE BUILDING: 86 OFFICES
- JEFFERSON QUARRY: 77 OFFICES
- COBB HALL: 73 OFFICES
- MCLEOD HALL: 67 OFFICES
- AURBACH MED. RESEARCH: 58 OFFICES
- SNYDER BUILDING: 57 OFFICES
- CLAUDE MOORE NURSING ED: 55 OFFICES
- EMILY COURIC CENTER: 52 OFFICES
- 2211 HYDRAULIC ROAD: 50 OFFICES
- FONTAINE BUILDING 1: 46 OFFICES
- CLAUDE MOORE MED. ED.: 44 OFFICES
- HEALTH SCIENCES LIBRARY: 42 OFFICES
- FONTAINE BUILDNIG 2: 40 OFFICES
- COLONY PLAZA: 37 OFFICES
- BATTLE BUILDING: 36 OFFICES
- CORNER BUILDING: 34 OFFICES
- WEST MAIN 617: 31 OFFICES
- 310 OLD IVY: 28 OFFICES
- PCC ANNEX: 23 OFFICES
- UVA TRANS. CARE: 22 OFFICES
- AUGUSTA: 21 OFFICES
- SPRING CREEK: 19 OFFICES
- UVA OUTPATIENT: 18 OFFICES
- UVA CLINICAL LAB: 18 OFFICES
- PARHAM: 17 OFFICES
- PETER JEFFERSON V: 16 OFFICES
- KIRTLEY: 15 OFFICES
- LYNCHBURG: 14 OFFICES
- ORANGE: 13 OFFICES
- GROVE STREET 999: 13 OFFICES
- TOWN CENTER ONE: 10 OFFICES
- CEDARS COURT: 10 OFFICES

30 REMAINING BUILDINGS HAVE <10



Offices may be **single or shared**.

Employees may have **more than 1** office for convenience.

4,423 OFFICES LOCATED IN **B, C, NO GRADE** BUILDINGS

TECHNICAL GRADE

A B C UNKNOWN CONDITION

Office/Administration Space Needs

When analyzing Current Inventory, a series of Office/Administration needs were identified. Some of these needs are currently fulfilled by insufficient quantities of community/respite/and collaborative space. The aim is to expand on successful spaces and provide new flexible areas to address all areas lacking in the current model.

Identified Needs

1. Need for privacy and security
2. Need for quiet focus space
3. Need for distributed, on-demand workspace
4. Need for more meeting and collaboration space
5. Need for access to food preparation and eating space
6. Need for greater variety of workspace

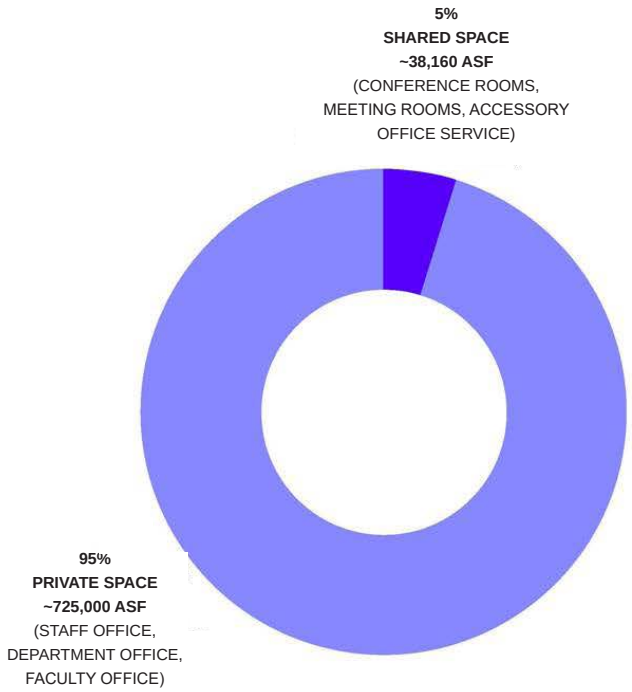
Office Guidelines

These guidelines create a methodology to fulfill identified needs while considering future culture change.

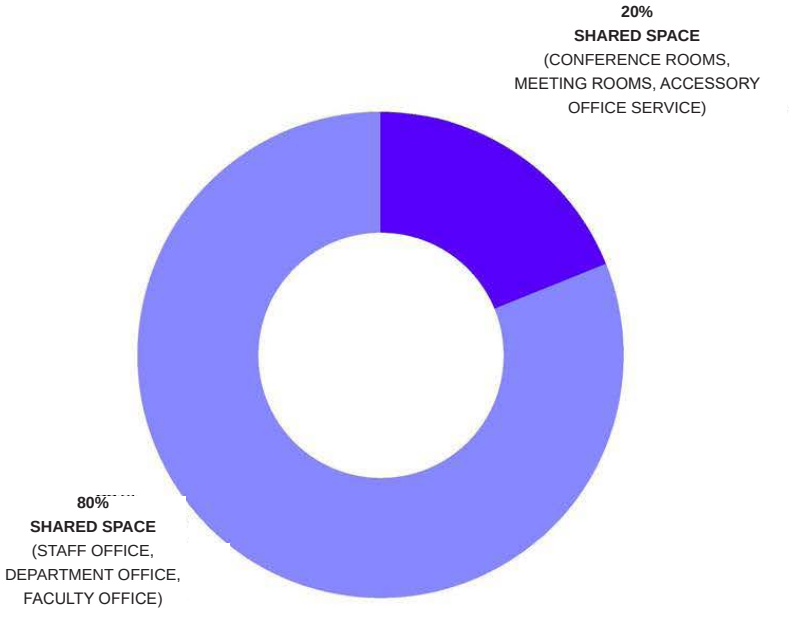
1. Seek out **space efficiencies** wherever possible
2. **Right-size** the private office
3. Promote use open office layouts, when appropriate and practicable
4. **Eliminate duplication**. One office rule regardless of geography.
5. Provide shared offices and hoteling/time-share offices/open workstations.
6. **Allow self-selection** of work environment
7. Provide shared, not departmental, **common support functions**, collaboration areas, and meeting spaces
8. Acknowledge **physical constraints of existing and historic** structures
9. Acknowledge **non-physical constraints** (recruitment culture and perceived image)

Workplace Inventory: Private/Shared Distribution

By adjusting office standards and right-sizing private space, it is possible to increase the amount of shared space.



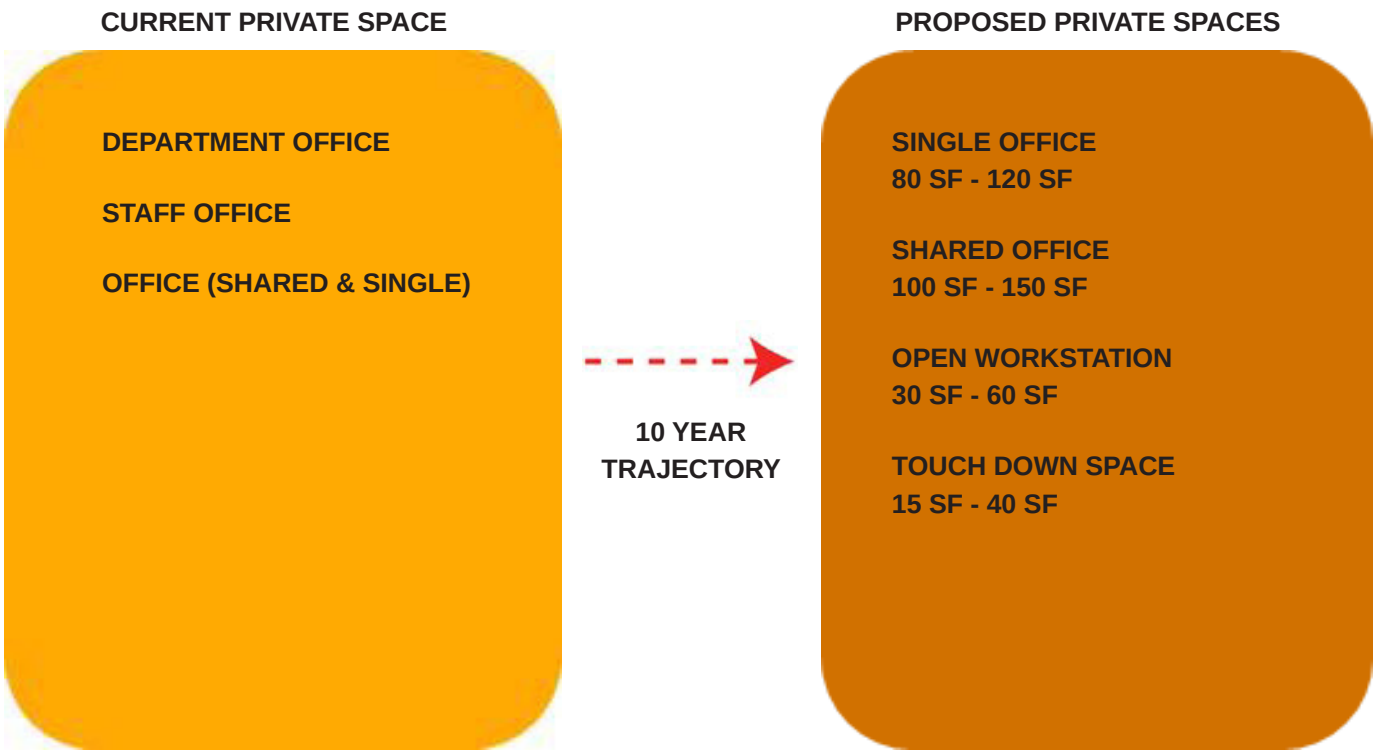
CURRENT DISTRIBUTION



PROPOSED DISTRIBUTION

Workplace Inventory: Private/Shared Distribution

By adjusting office standards and right-sizing private space, it is possible to increase the amount of shared space.



Private Space: Concepts

The new workplace will include Private Offices that are efficiently sized and maintain flexibility (if necessary they can be shared or used as a meeting room). The addition of Open Workstations will allow for better communication and encourage a culture of discussion and collaboration.

Private Office

Open Workstations

Workplace Inventory: Private/Shared Distribution

By adjusting office standards and right-sizing private space, it is possible to increase the amount of shared space.

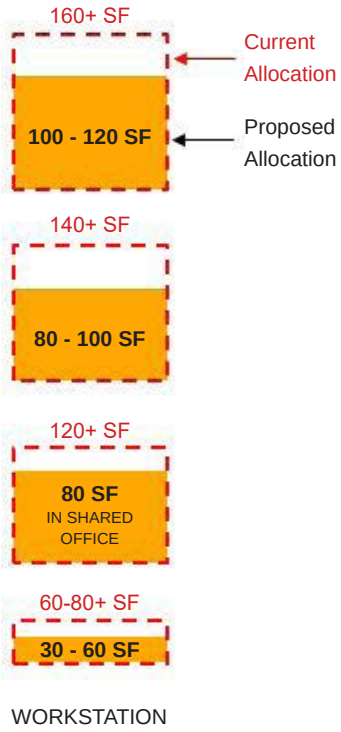
ACADEMIC MEDICAL

Assoc/Asst Dean
Dept Chair
Senior Staff

Tenure Track Faculty
Non-Tenure Faculty
Active Emeritus Faculty

Part-time Faculty
Lecture
Fellow
Research Associate

TA / RA
Hoteling



ADMINISTRATIVE

Assoc/Asst VP
Director
Senior Staff

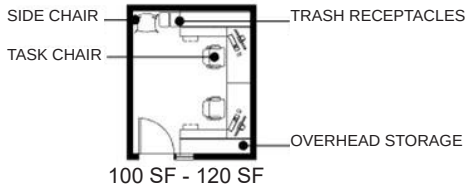
Senior Professional Staff
Assoc/Asst Director

Part-time Professional Staff
Support Staff

Admin Support
Temp Staff / Student
Hoteling

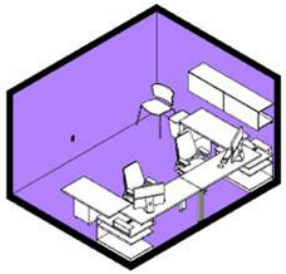
Private Space: Office Space Models

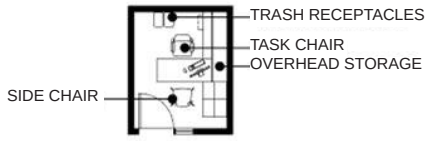
Sample models of future spaces. Office sizes may range from 80 SF – 120 SF.



100 SF - 120 SF

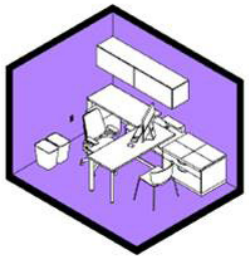
CASE STUDY: 120 SF

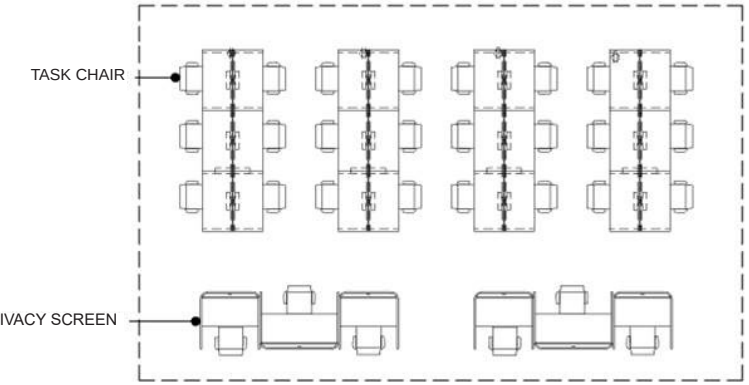




80 SF - 100 SF

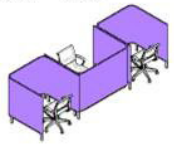
CASE STUDY: 90 SF





OPEN WORKSTATION

50 SF - 65 SF



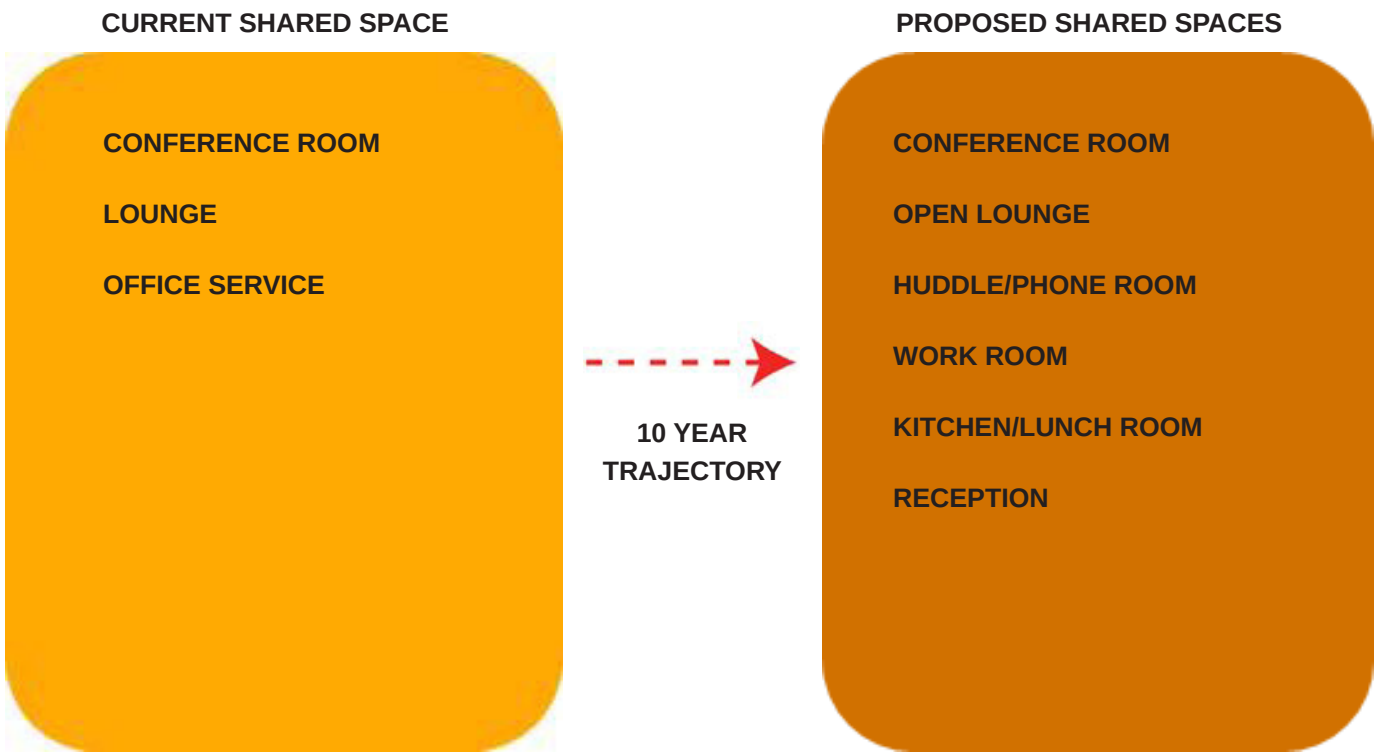
HOTELING

20 SF - 25 SF

Shared Space: Current v. Proposed

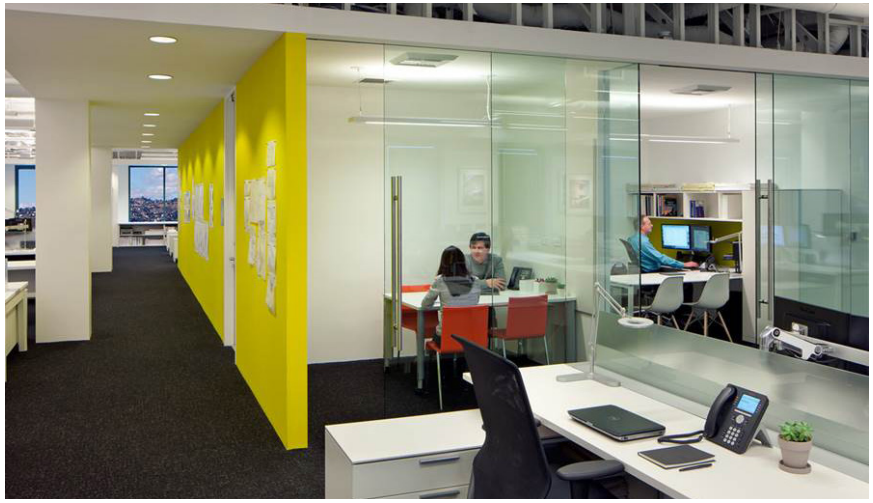
How will the types of Shared Space evolve?

By right-sizing private space, there will be more opportunity to develop shared spaces.



Shared Space: Concepts

Touchdown space in shared spaces to allow for collaboration and private work outside the office.



Huddle / Phone Room

Open Lounge

Shared Space: Concepts

Create areas for planned and spontaneous meetings.

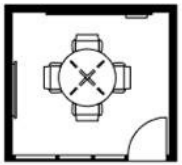
Conference Room

Kitchenette

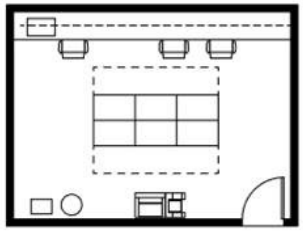
Shared Space: Office Space Models

Create places to work, meet and eat together.

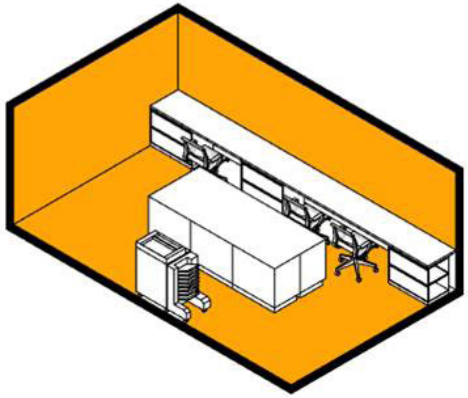
KITCHENETTE

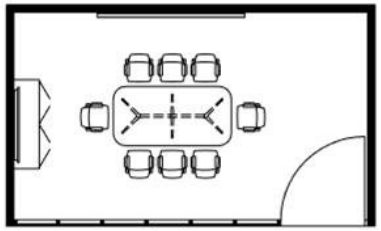


PHONE ROOM

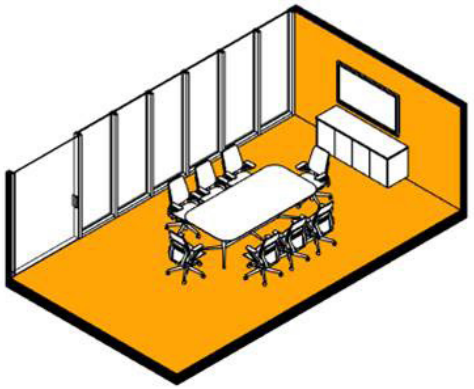


OPEN WORK ROOM





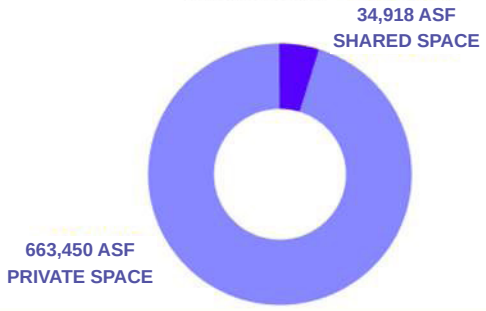
CONFERENCE ROOM

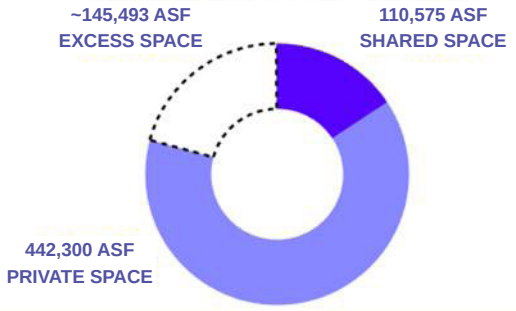


Current versus Projected Inventory

By right sizing space and maintaining the number of work spaces (in private/shared offices and workstations), there will be excess space that can be designated for new uses.

	CURRENT INVENTORY	PROJECTED INVENTORY	NET CHANGE
PRIVATE: SHARED	95:5	80:20	
AVERAGE OFFICE SIZE	~ 150 ASF	100 ASF	
NUMBER OF WORK SPACES	4423 OFFICES	4423 WORK SPACES	
PRIVATE SPACE ASF	~ 663,450 ASF	442,300 ASF	-221,150 ASF
SHARED SPACE ASF	~ 34,918 ASF	110,575 ASF	+ 75,657 ASF
TOTAL	~ 698,368 ASF	552,875 ASF	-145,493 ASF LESS SPACE





MISSION REPORT: COMMUNITY SPACES

Analysis and Recommendations: Community Space and Amenities

By virtue of how it has grown up (in organizational silos), the University of Virginia Health System has chronically left the 'connective tissue' of campus planning to others or to the next project. Thus, amenities (except those serving patients) are virtually non-existent, and one of America's great university campuses contains a Health System with inadequate public space (especially outdoor space with access to fresh air), poor amenities for staff and insufficient infrastructure to support the 15,000+ employees who work there. The section which follows highlights the need and sets forth considerations that future efforts should follow in order that the major investment the ISP represents not only provides the capacity and supportive space the organization needs to execute its mission, but that it results in a more humane and supportive environment for all who access the Health System.

Shared Space: Office Space Models

Create places to work, meet and eat together.

SOCIALIZE

Wellness
Food Services
Organization
Student Lounges
Circulation
Lobby

COLLABORATE

Group Rooms
Study Lounge
Noisy Study
Academic Societies

FOCUS

Study Carrel
Phone Booth
Quiet Study
Home Study

REJUVENATE

Food Service
Exterior Space
Contemplative Space
Wellness
Recreation

Community Space Goals

Open Lounges, eating environments, and thoughtfully placed seating areas will increase interaction amongst peers and foster a sense of collaboration and communication. Circulation areas will also become spaces for spontaneous interaction.

SOCIALIZE

Wellness

Food Services

Organization

Student Lounges

Circulation

Lobby

Community Space Goals

Designated areas for casual and professional meetings will encourage individuals to interact with their peers and engage in both collaborative and independent work.

COLLABORATE

Group Rooms

Study Lounge

Noisy Study

Academic Societies

Community Space Goals

Quiet areas will allow individuals to engage in more focused work when necessary. Some of these spaces may have private components for

FOCUS

Study Carrel

Phone Booth

Quiet Study

Home Study

Community Space Goals

Enhanced outdoor spaces will provide areas of respite to the community, and encourage recreational activities. Since UVa's mission demonstrates a commitment to improving the overall health of the community, dedication to wellness and recreation will be paramount.

REJUVENATE

Food Service

Exterior Space

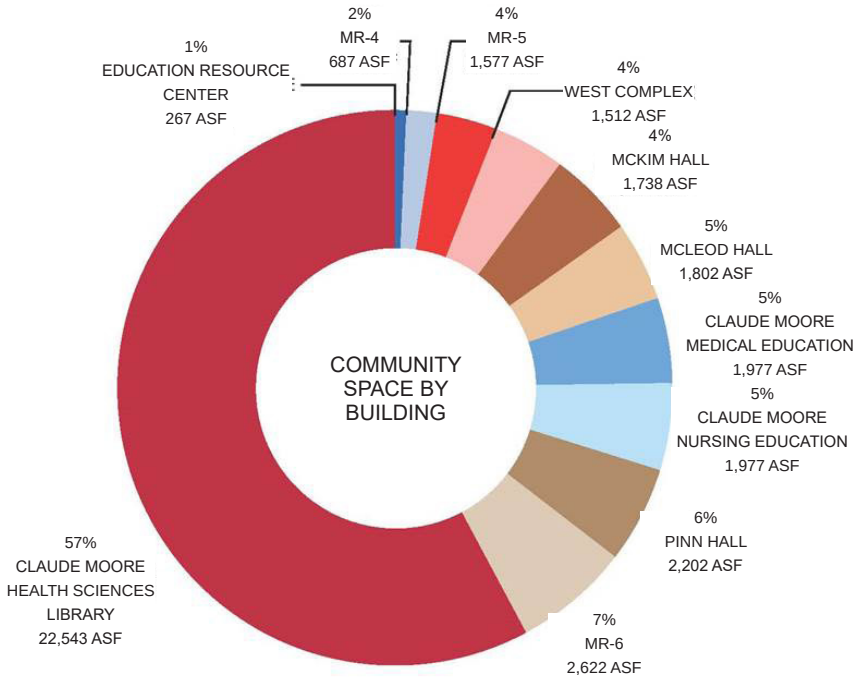
Contemplative Space

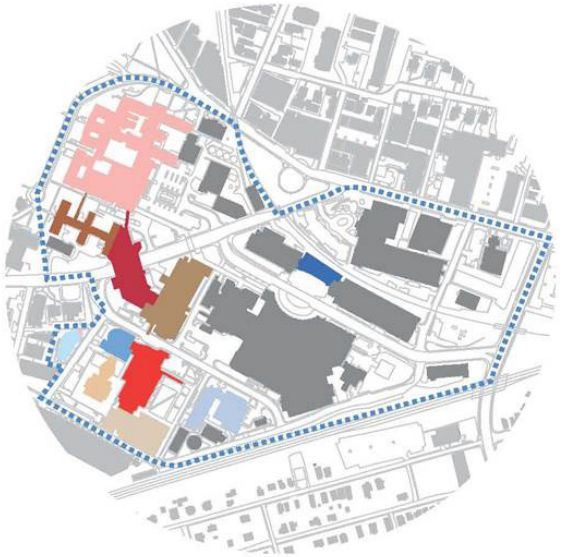
Wellness

Recreation

Community Space Distribution

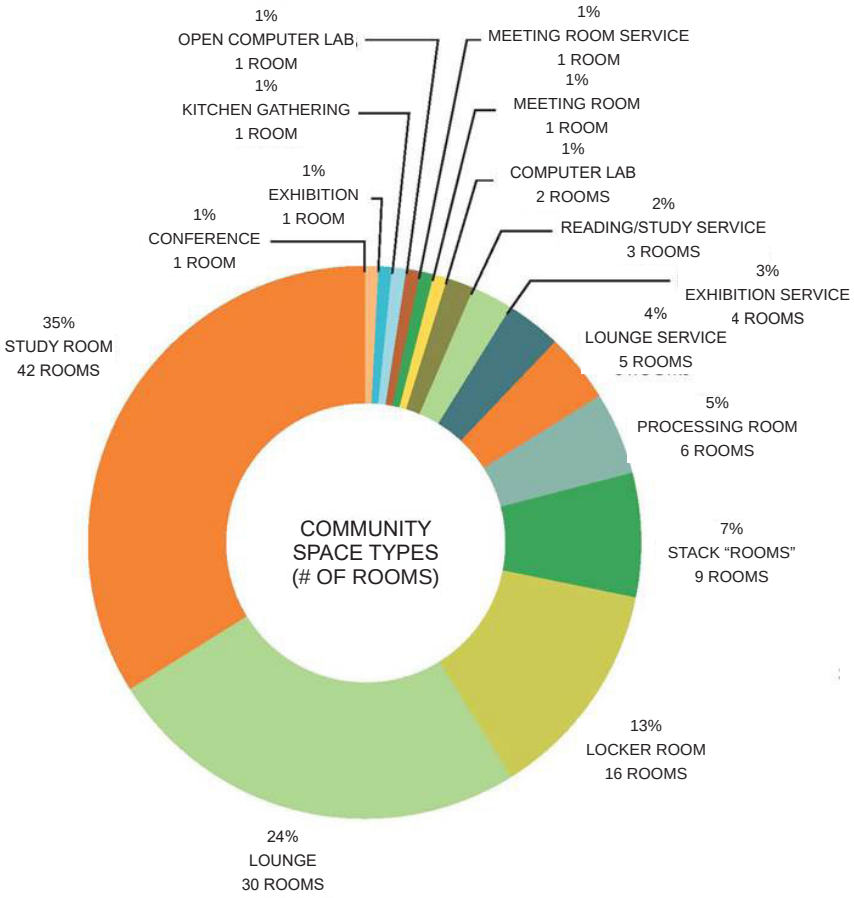
Existing Community Space is composed of Lounge, Locker Rooms, Kitchen Gathering Spaces, Exhibition Spaces, Meeting Rooms, Reading/Study Service, Study Rooms, and Waiting Rooms, etc. Over half of designated Community Space is located in the Health Sciences Library. There is some other Community Space sprinkled throughout campus, but it isn't always distributed effectively.

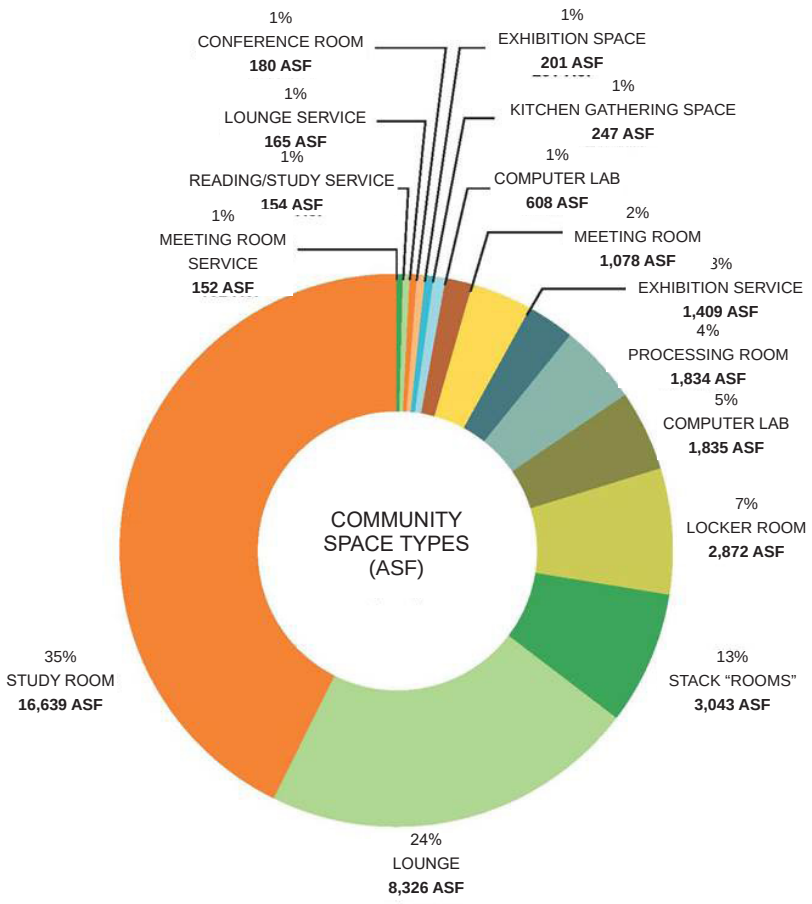




Community Space Types

The analysis comparing the number of Community Spaces to the SF allocation demonstrates that there is a lack of medium and large gathering spaces.





Existing Community Space

Examples of existing Community Space can be found in McLeod Hall, Claude Moore Nursing Education Building, Claude Moore Medical Education Building and Pinn Hall amongst others.


Pinn Hall


Claude Moore Nursing Education


Claude Moore Nursing Education

Cafe McLeod

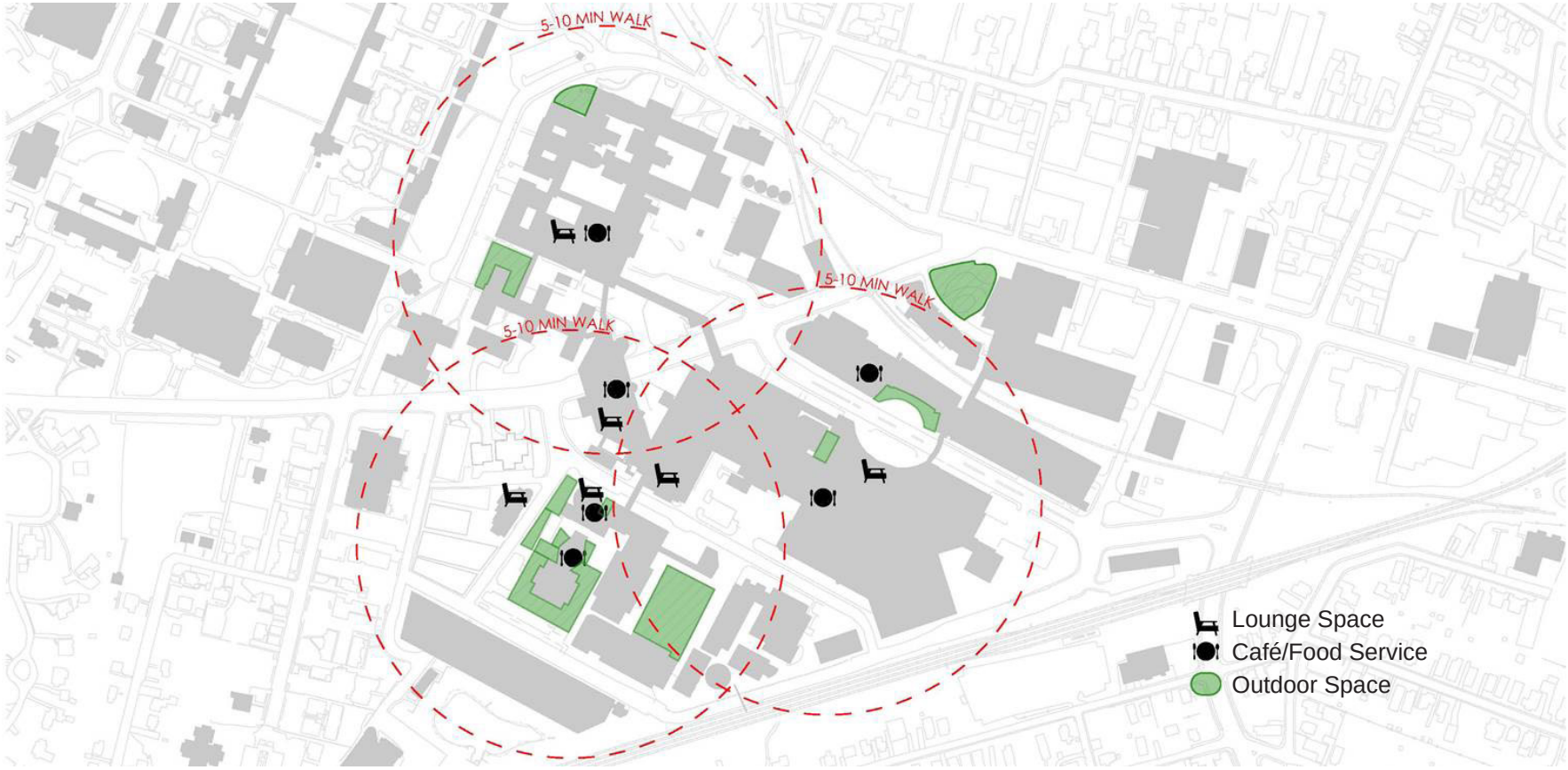

McLeod Hall


Claude Moore Med. Education

Location of Current Campus Amenities

Identifies Existing Outdoor Space, Lounge Space, and Cafeteria/Food Options adjacent to most occupied areas on campus.

Guidelines for future development will 1) Create **Interior and Exterior Spaces** to fulfill Community Space Goals 2) Develop amenities within a **5 min walk** of any point on campus 3) Fulfill UVa's mission to improve the overall health of the community by creating space dedicated to **Wellness and Recreation**.



Identified Needs

Based on Current Inventory, there are still deficiencies in Community Space.

- Signature, Health System-wide communal space
- Collaborative space in the clinical environment
- Workplace-lifestyle balance
- Supporting the UVa culture and brand
- Wellness and sustainability
- Outdoor space

Community Space Distribution

Future guidelines aim to create a diversity of Community Spaces. Therefore, it will be important to amplify existing spaces (enhance and create additional lounge space, etc), but also create spaces that are not currently part of the Community Space Inventory. Ex: Fitness Center.

Current Community Space Types:

- Lounge
- Locker room
- Kitchen gathering space
- Exhibition space
- Meeting room
- Study room
- Waiting room

Additional Proposed Community Space Types:

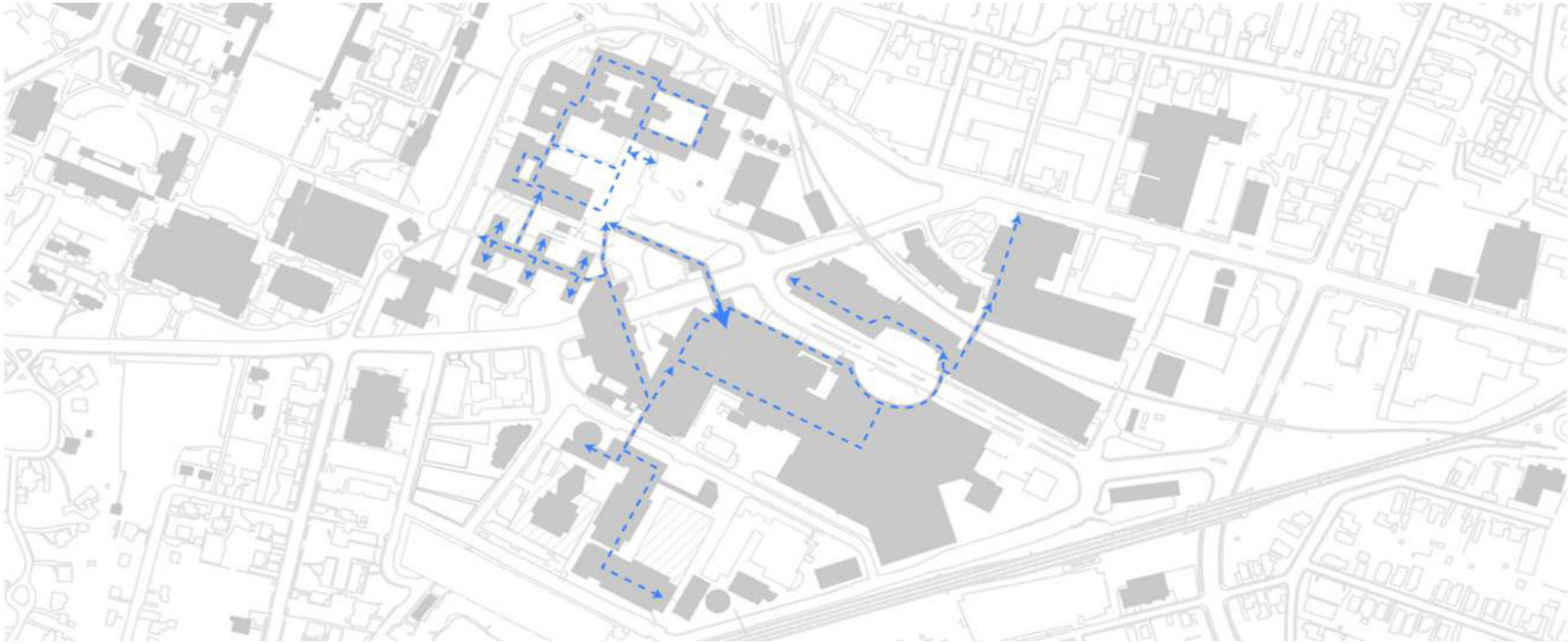
- Communitiy forum space
- Cafe
- Wellness / fitness center
- Green space
- Open seating for eating
- Faculty lounge

Community Space Concepts

Flexible spaces allow users to collaborate, work alone, eat lunch and relax. These spaces may serve one or more of these purposes.

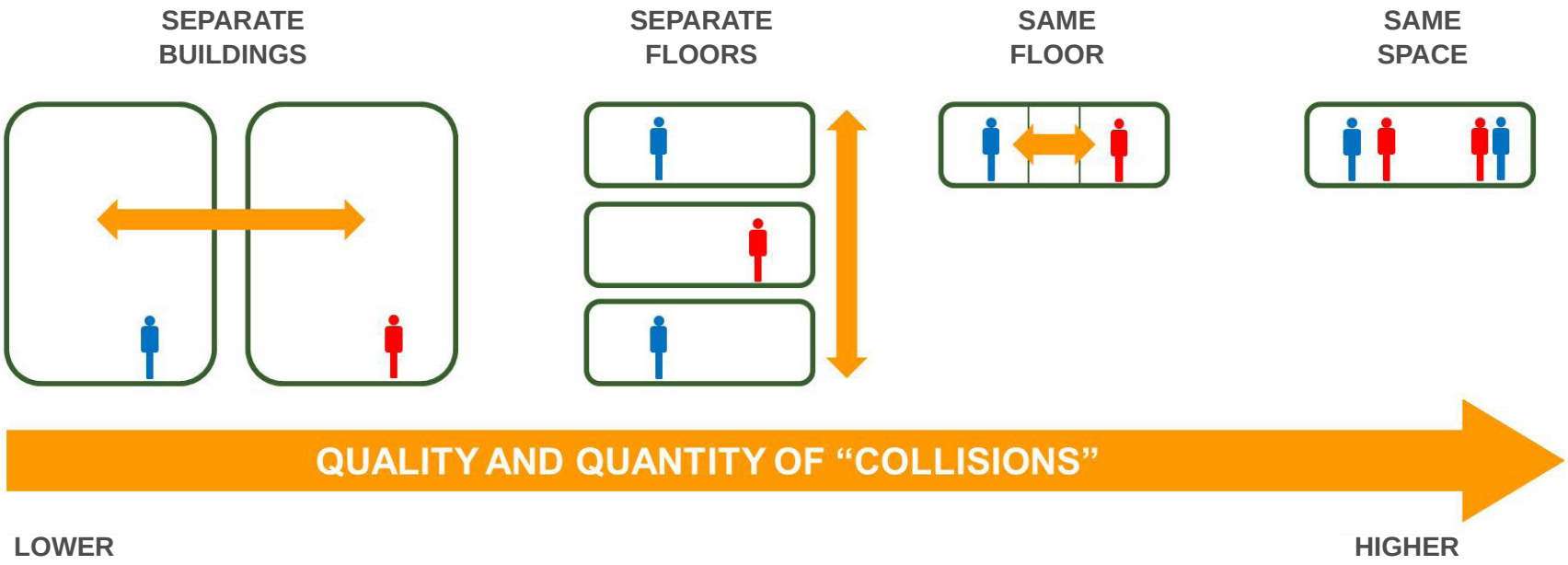
Existing Corridor Circulation

UVa has an extensive circulation system that allows for spontaneous interaction.



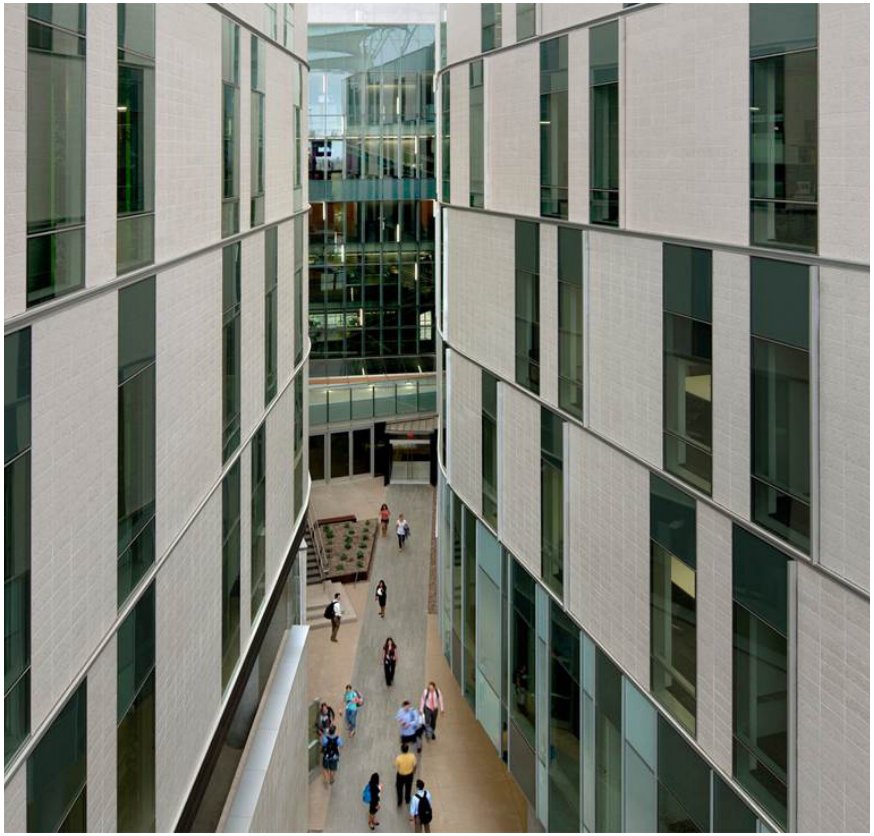
Community Space Concepts

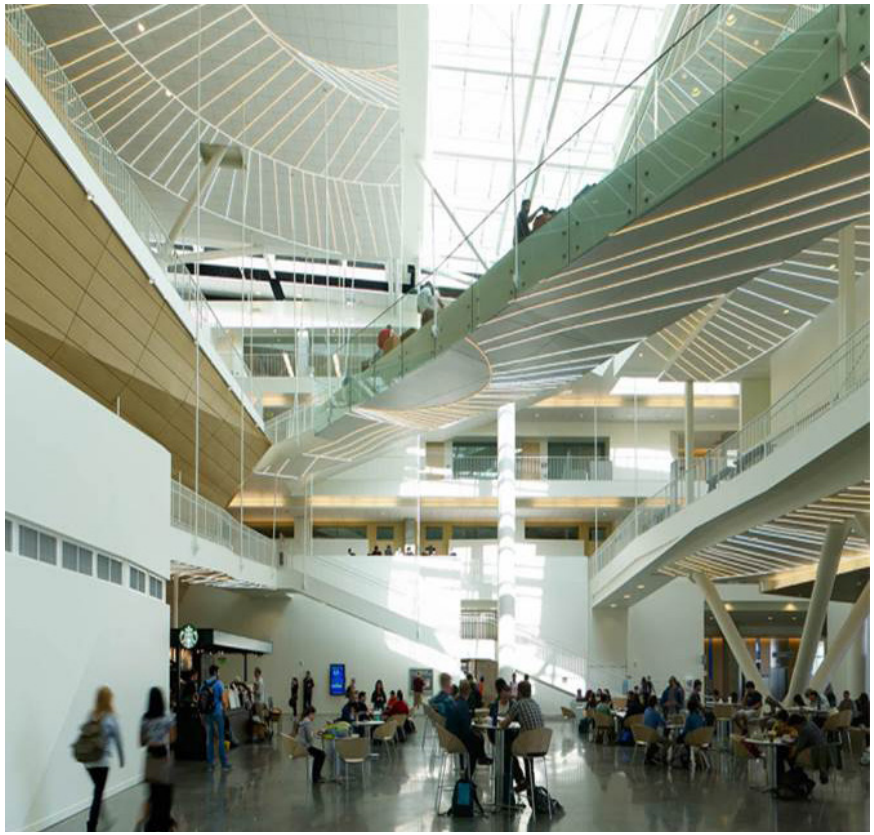
Create Interaction between different members of the Health Sciences Campus.



Community Space Circulation Concepts

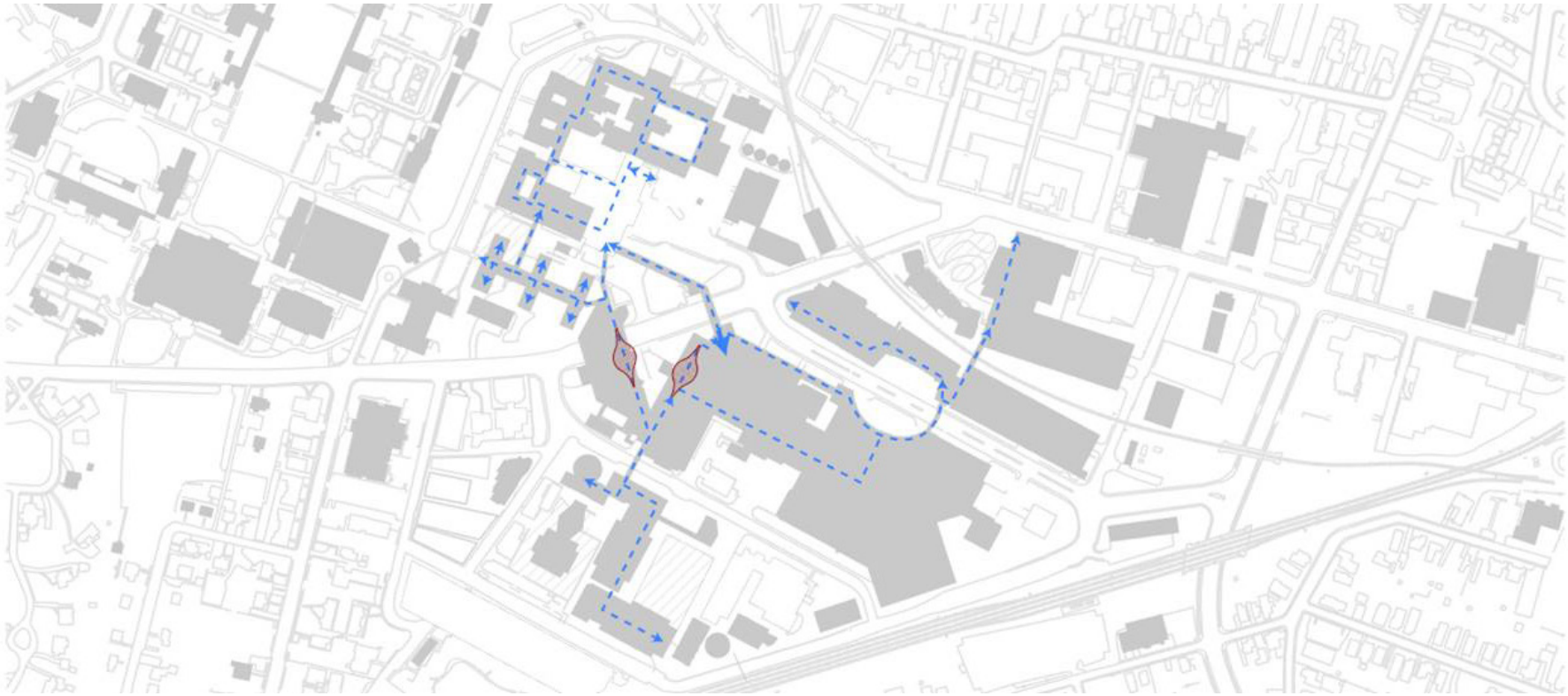
These two projects demonstrate how circulation can also serve as Community Space.
As people make their way to class/work/an appointment, there is opportunity to sit and eat, study, or collaborate.





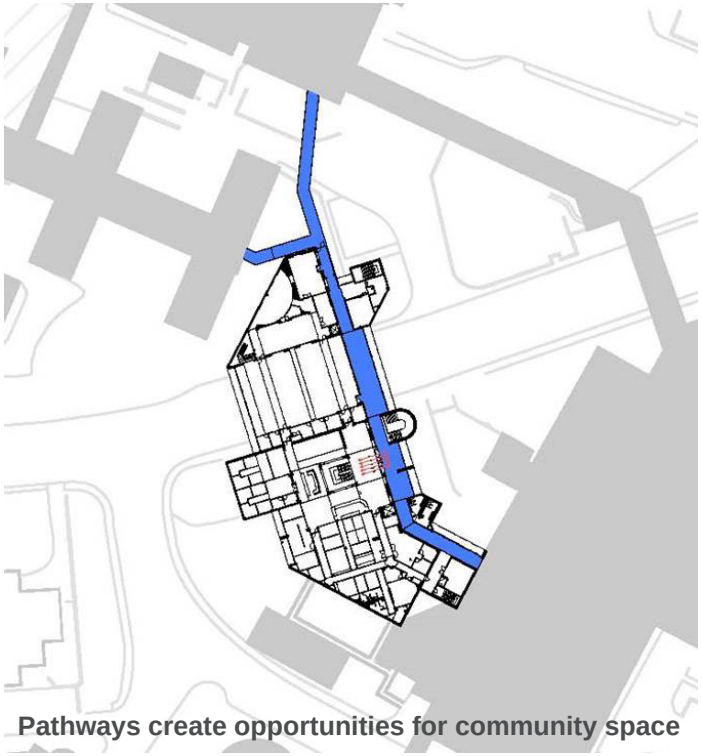
Existing Corridor Circulation

Using the network as a framework, there are opportunities to develop community “nodes.”
Two examples are the corridor outside the Library, and the Lobby outside the Pinn Hall Lecture Halls.



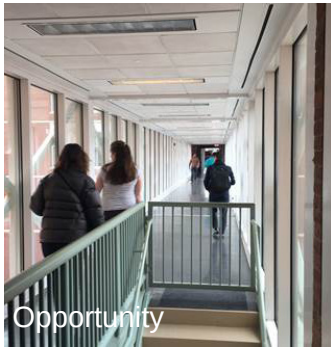
Existing Corridor Circulation Case Study

The pathway outside the Library already behaves as Community Space. If this condition is used as a model for other areas in the corridor, it is possible to expand casual lounges and meeting space across the entire campus.



Pathways create opportunities for community space

Hallway as community space



Opportunity

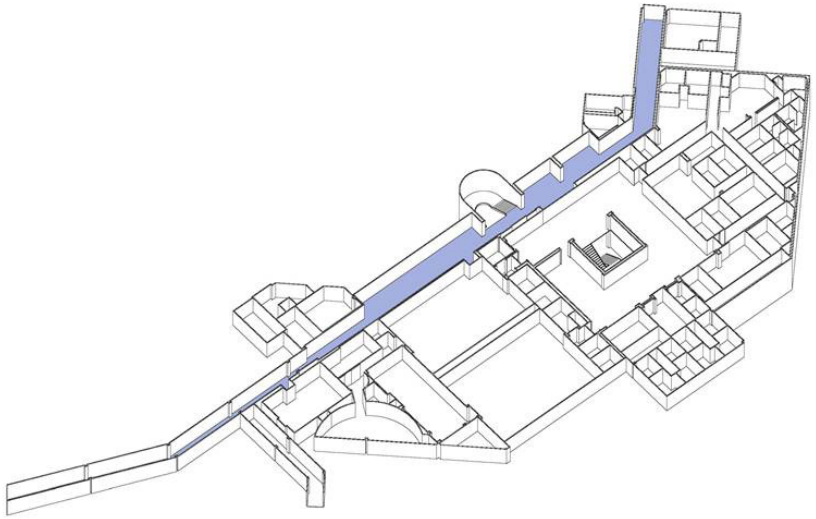
Opportunity

Open Space

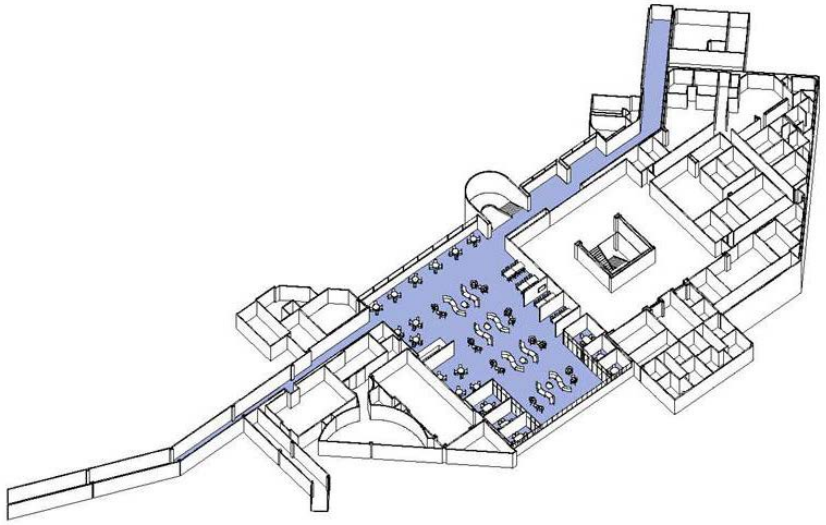
Case Study: Health Sciences Library

Enhance existing corridor condition.

Expand space into Library and create Meeting Rooms, Study Spaces and Varied Seating. Larger space can also function as Community Forum.



Existing Condition

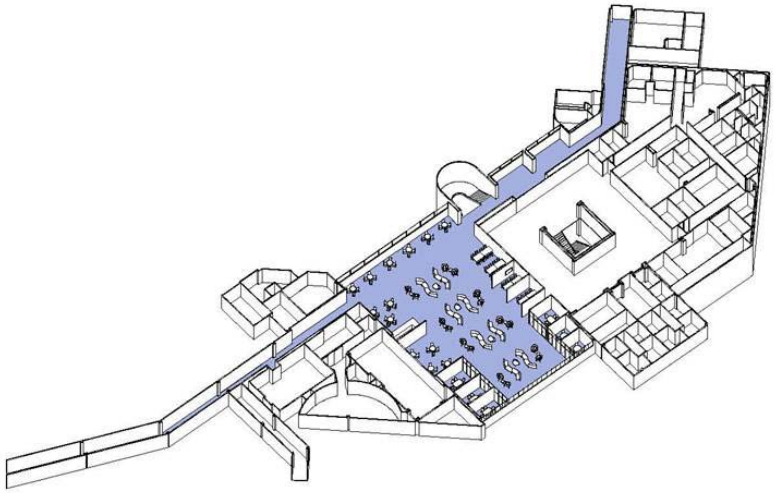


Space Opportunity

Case Study: Health Sciences Library

Enhance existing corridor condition.

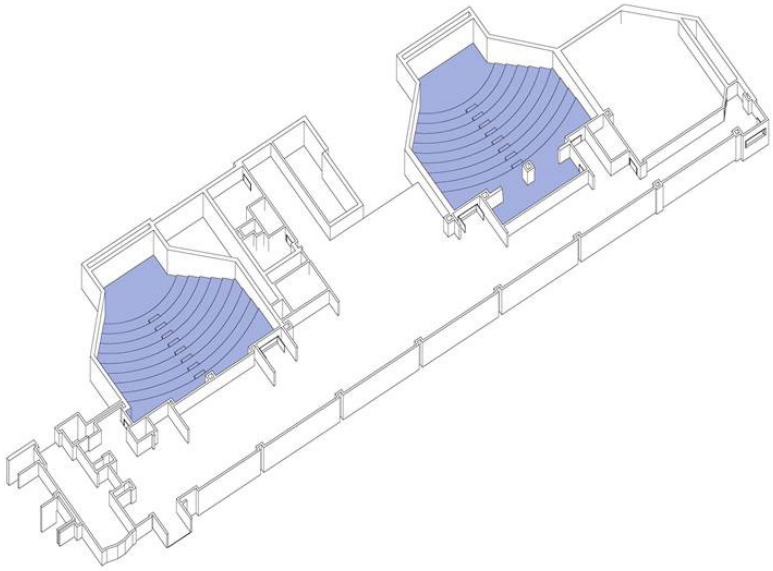
Expand space into Library and create Meeting Rooms, Study Spaces and Varied Seating. Larger space can also function as Community Forum.



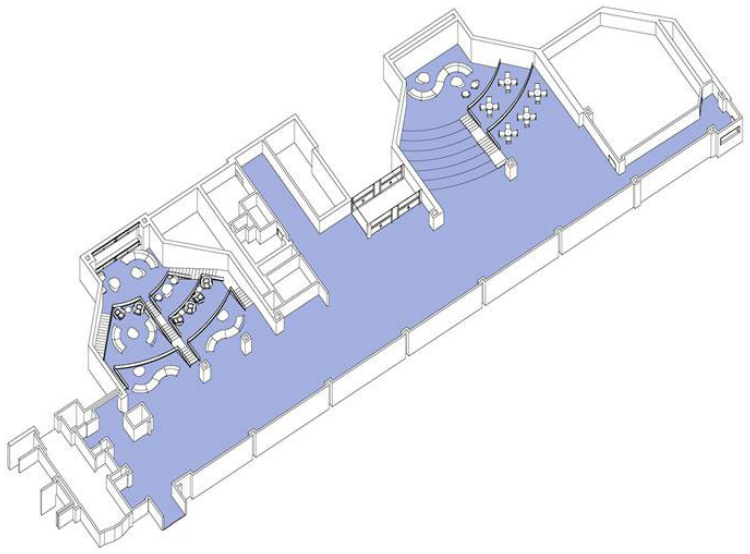
Case Study: Pinn Hall Auditoriums

The current existing condition features two stepped auditoriums in poor condition. Not only are the spaces not ideal for evolving Teaching processes, they also fail to serve current needs for large lectures and poster sessions.

This Case Study reconfigures the Pinn Hall Auditoriums as a continuous Community Space, demonstrating the opportunity to activate outdated facilities.



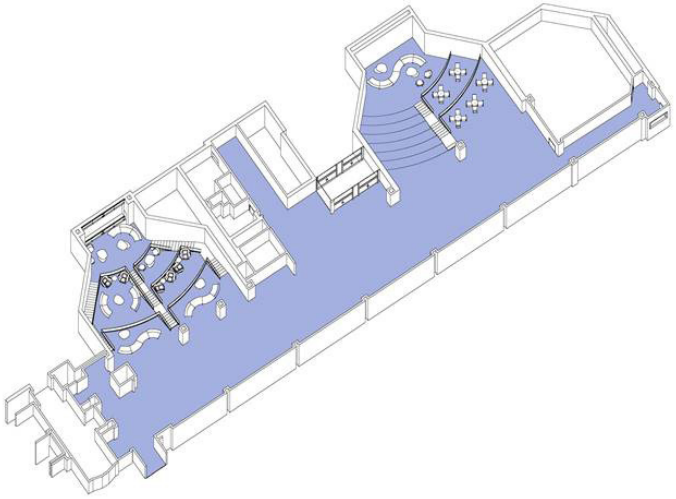
Existing Condition



Space Opportunity

Case Study: Pinn Hall Auditoriums

This concept image illustrates an opportunity to create varied seating, and introduce natural light into a renovated auditorium. Terraces invite passerby to sit and study independently, or meet with peers.



Community Space Summary: System-wide and Designated Space

Attention must be paid to specific needs of Research, Clinical, and Educational spaces. However, it's also important to address system-wide community spaces that are currently insufficient.

SYSTEM-WIDE

COMMUNITY FORUM SPACE FOR EVENTS ACROSS SYSTEM

VARIED EATING OPTIONS

WELLNESS/FITNESS CENTER

GREEN SPACE (WITH VARIED SEATING FOR DIFFERENT USES)

OPEN SEATING FOR EATING - INTERIOR AND EXTERIOR

DESIGNATED

CLINICAL

DESIGNATED FACULTY LOUNGE / RESPITE AREA
CAFE AND GREEN SPACE FOR PATIENTS
WAITING ROOMS

RESEARCH

COMMUNAL KITCHEN AND LOUNGE BY DEPT.
LOCKER ROOMS (FOR ITEMS BANNED FROM LAB)
LARGE FORUM SPACE (POSTERS)

EDUCATION

DESIGNATED STUDENT LOUNGES BY PROGRAM
VARIED STUDY AREAS (SINGLE AND GROUP)
VARIED FOOD AREAS (24 HR)

APPENDIX

ADDITIONAL CONTEXT AND FURTHER DETAIL

Other Inpatient Bed Considerations

Additional detail from inpatient/hospital assessment.

Bed Type	Current Condition	Future Considerations	Sufficient Future Capacity
Bed Type	• NICU is experiencing max operational occupancy while Women's and Pediatric units have available operational & physical capacity • Recent capital investments have been completed to refurbish 7th and 8th floor units • Inpatient clinical program 'shifts' are still being discussed as the New Tower expansion is under development	• University Hospital will remain the leader for complicated deliveries • Future network and partnerships could be utilized to provide delivery services for uncomplicated births	✓
NICU		• University Hospital will remain the primary regional provider for NICU services	Investigate options to align operating and physical capacity
General Peds		• Partnerships with community hospitals may be able to absorb General Pediatric care, utilizing the University Hospital for higher acuity services	✓
PICU		• A higher demand for PICU beds (vs. General Pediatric) may be required as UVaHS continues to expand pediatric network	Conversion of General Peds to PICU beds may be required
Behavioral Health	• University hospital nearing max occupancy • Minimal opportunity to expand On Grounds	• Covering 2M lives will require an expansive increase in IP capacity, especially for a service line projected to increase in admission utilization. Growth likely through partnerships, not University Hospital	Partnerships will be required to meet future 'at-risk' patient demand

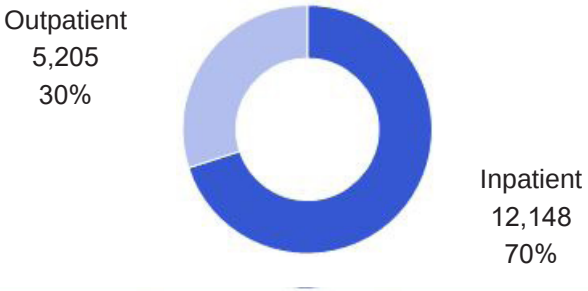
Hospital Based Surgery Review

Additional detail from inpatient/hospital assessment.

Historically, Hospital based outpatient surgery was 36% of total cases prior to Battle Building opening. Incremental inpatient surgery can be accommodated through:

- Incremental capacity coming online (4 OR's)
- Throughput enhancements
- Remaining opportunity to decant qualified OP cases

2015 Hospital Based Surgical Cases



	Current Capacity	FY2015 Activity	Annual Throughput	Adjusted Capacity (New Tower)	Adjusted Annual Throughput	Target Annual Cases per OR	Growth Opportunity
Hospital Based Surgery	26 /a	17,353 cases	667 cases / OR	30	578 cases / OR	700 - 800	+5,000 cases
Battle Building ASC	12	11,487 cases	957 cases / OR	12	957 cases / OR	1,100 - 1,300	+3,000 cases

1. *26 ORs included in throughput calculation. OR rooms include 1-12, 14-27. Others are excluded due to inflexibility of use (iMRiS #28,29 &Hybrid IR/OR #30). There is no OR #13.*
2. *IP surgery includes all SSP and PPP requiring extended recovery*

Summary of Hospital Diagnostic/Treatment Departments

Additional detail from inpatient/hospital assessment.

Department Name	Key Rooms	Annual Volume Opportunity	General Comments
Emergency Department, renovated in expansion	16 ED 10 CDU	100k patients (total, 1500/room)	Expansion creates modern pods for trauma, peds, adult, rapid care and psych
Surgical Services	30 (4 hybrids)	24k cases (total, at min)	Expansion will provide ample capacity for future growth and improved environment
Interventional/ Diagnostic Imaging	8 IR/Ang 8 Cath/EP 2 NM 4 MRI 4 CT 6 U/S 5 Flouro 7 Rad	12k procedures 12k procedures 6k procedures 14k procedures 18k procedures 30k procedures 50k procedures 70k procedures	Diagnostic imaging is predominantly located on level 01 of Hospital. MRI is currently located near ED in a peninsula configuration. (Future location where?) Other existing and new interventional imaging is located on Level 02 in Expansion
Clinical Laboratory	N/A	N/A	Existing Clinical Lab is 50% in West Complex and 50% in Core Lab Building and expansion-in-place is not a future option

Summary of Hospital Support/Admin Departments

Additional detail from inpatient/hospital assessment.

Department Name	General Comments
Hospital Administration	Hospital-related administration is **predominantly fragmented across four to five buildings on-grounds**, including distributed throughout the hospital: Hospital, Corner, Stacey Hall, PC Annex, and West Complex **Possible investment to consolidate and reorganize** **Possible investment to replace Stacey Hall**
Clinical Support Services i.e. Biomed, Food Services, EVS, Materials Management, Sterile Processing, Central Storage, etc.	Predominantly on Level G of the existing Hospital with some clinical support services being added to Lvl G of the expansion. It is generally sufficient. Biomed is located in Stacey Hall in very outdated infrastructure. **Possible investment to replace Stacey Hall**
Clinical Support Services (Pharmacy)	**Fragmented and in outdated infrastructure**: Main Pharmacy is landlocked on the Lvl G of Hospital and space also located on Lvl 01 of West Complex **Possible investment to consolidate/expand in future**

Existing Traffic Considerations

Summary of previous studies completed by Vanasse Hangen Brustlin, Inc. (VHB)

Vanasse Hangen Brustlin, Inc. VHB

Access to the Health System campus is provided mainly through:

- Jefferson Park Avenue to the west and southwest
- West Main Street to the east and west
- Roosevelt Brown Boulevard to the south
- 10th Street to the north

In addition to the above UVA Health System projects, there are three external mixed-use developments being planned near the campus that will impact operations along the surrounding street network. The developments consist of the following land uses:

The Flats (under construction):
- 219 apartments
- 7,000 sf of specialty retail center
- 5,300 sf of high-turnover Restaurant

The Standard:
- 205 midrise apartments
- 7,261 sf of specialty retail center

1000 West Main Street:
- 240 apartments
- 9,500 sf of retail space

Future Traffic Recommendations

Summary of previous studies completed by Vanasse Hangen Brustlin, Inc. (VHB)

Vanasse Hangen Brustlin, Inc

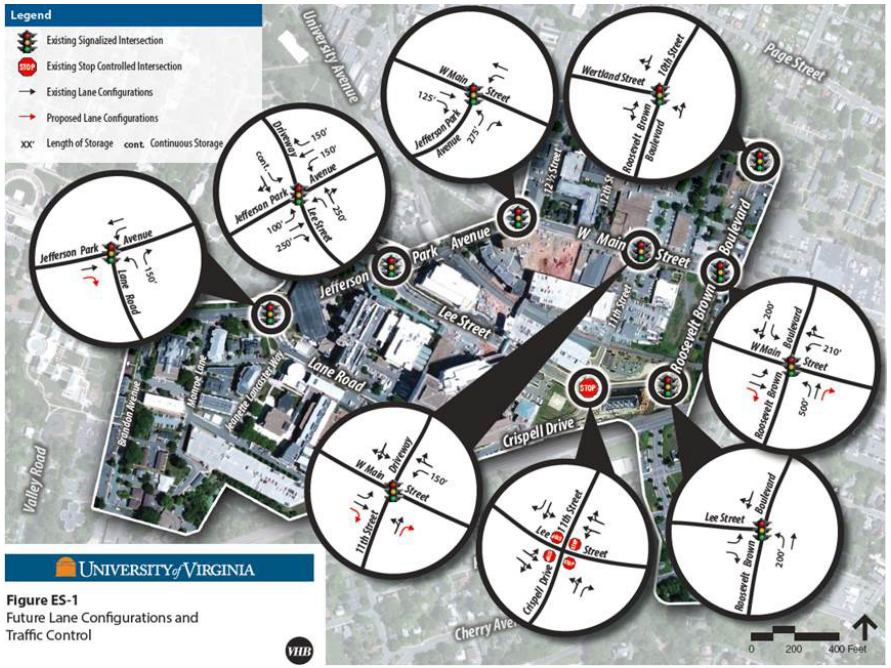


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Figure ES-1
Future Lane Configurations and Traffic Control

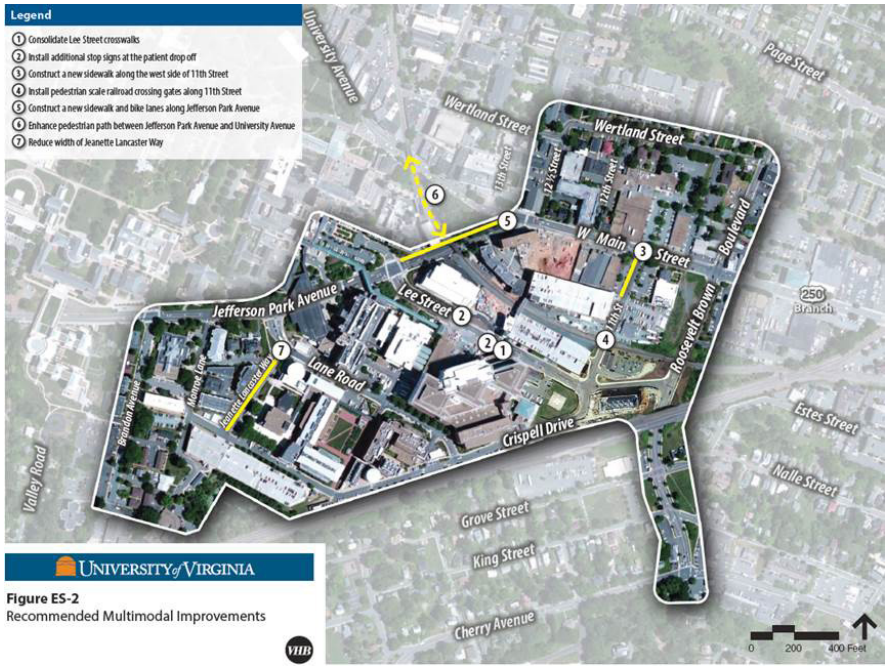

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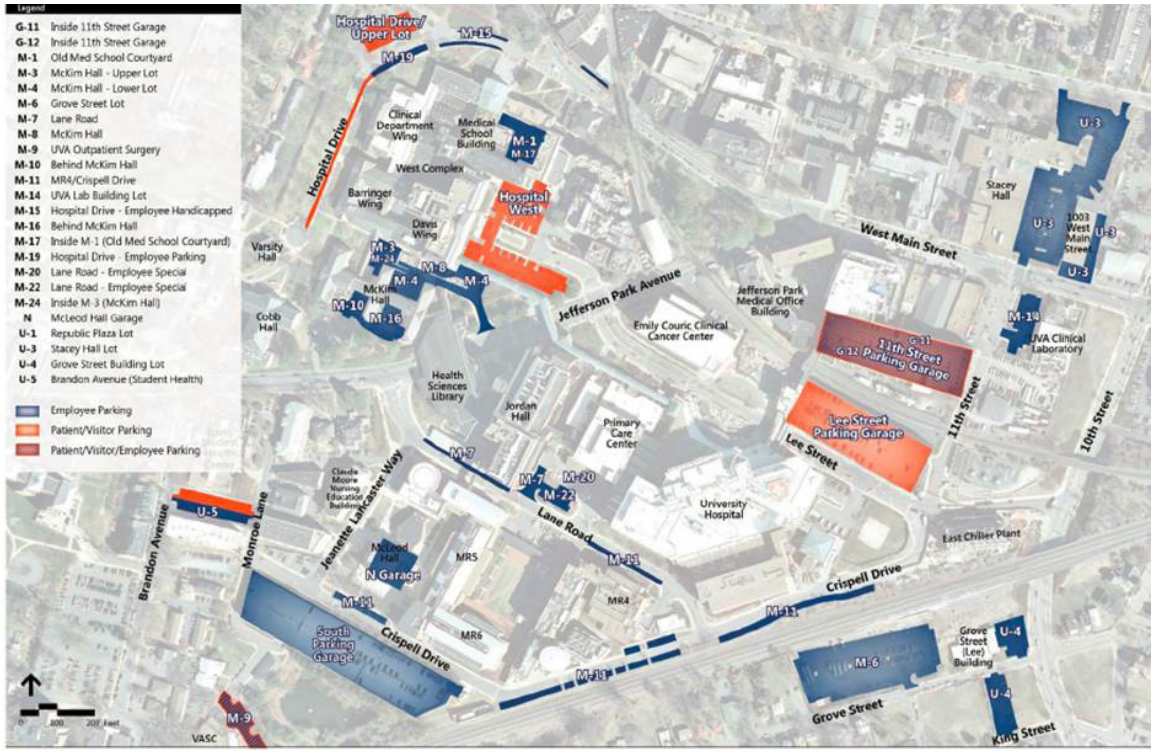
Figure ES-2
Recommended Multimodal Improvements

1. For the purpose of assessing future year operations, it is assumed that all three mixed-use developments, the Battle Building, and the Education Resource Center are built by 2016 and the Emergency Department Expansion is completed by 2020. – from VHB Report

Existing Parking Considerations

Summary of previous studies completed by Vanasse Hangen Brustlin, Inc. (VHB)

Vanasse Hangen Brustlin, Inc.



- Convenient Patient/Visitor Parking is a clear priority
- Patient/Visitor parking demand is approaching capacity limit (98%)
- Employee parking in the Health System District is overloaded and disjointed
- Additional parking capacity remains in remote parking lots
- Peak ridership on UTS Green Route exceeds bus capacity

Future Parking Recommendations

Summary of previous studies completed by Vanasse Hangen Brustlin, Inc. (VHB)

Vanasse Hangen Brustlin, Inc. VHB

User Group	Existing Parking Occupancy	Future Demand Increase	Future Total Parking Demand	Future Total Parking Capacity	Effective Future Parking Capacity (95-97%)	Restricted/ Unavailable Capacity	Net Future Parking Capacity
Patients/Visitors	1,198	99	1,297	1,219	1,181	-22	1,159
Employee Parking (Health System District)	2,399	234	2,633	2,845	2,750	-150	2,600
Remote UVA-HS Employee Parking	1,655	126	1,781	4,207	n/a	n/a	4,207
Total	**5,252**	**459**	**5,711**	**8,321**			**7,966**

- Hospital Expansion and ECCCC fit-out considered in future demand calculations
- Employee parking will have to shift to Patient/Visitor parking
- **Peak parking cannot be accommodated**

User Group	Net Future Parking Capacity	Future Total Parking Demand	Reserve Parking Capacity (spaces)
Patients/Visitors	1,159	1,297	-138
Employee Parking (Health System District)	2,600	2,633	-33
Total	**3,759**	**3,922**	**-171**