

Austin State Hospital Brain Health Campus Master Plan



The University of Texas at Austin
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TEXAS
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Executive Summary

The State of Texas has a unique opportunity to create a model environment for the continuum of brain health care in Central Texas with the implementation of the Austin State Hospital (ASH) Brain Health Campus Master Plan. The master plan seeks to accommodate a new person-centered hospital on the historic campus with opportunities for healthcare partnerships in close proximity.

Though located outside the city upon its initial construction, the current campus of approximately 95 acres is now situated within the center of Austin, with vibrant residential neighborhoods, mixed-use development, and busy streets on all sides.

The primary objective of the plan is to outline a strategy for replacing current hospital functions and to provide a long-term vision for the build-out of the campus to create the continuum of care necessary for the future of brain health in Austin and surrounding served communities.

Team and Process

The master plan process was a collaborative effort among the planning team, the ASH Brain Health Redesign Steering Committee, and the Facilities Planning Subcommittee with the intent to appropriately integrate the physical framework for the campus with the vision and operational structure set forth by the Steering Committee. The master planning effort was led by planning and healthcare experts from Page in partnership with psychiatric facility specialists from architecture+ and hospital cost estimators from Vermeulens. The team met regularly with the Steering Committee, as well as Health and Human Services Commission (HHSC) leadership and chairs from all subcommittees.

Goals

Four primary goals were established for development of the master plan and for the evaluation of alternative development scenarios.

Goal 1 Create a Brain Health Campus

In order to establish a brain health campus, the ASH Brain Health Campus Master Plan recognizes the initial need for replacing the outmoded ASH buildings with a modern inpatient facility. The master plan establishes a program for a minimum 240-bed hospital facility, budget estimate, schedule, and preferred site, while maintaining the existing hospital operations until the new hospital is complete. This facility will be the first step, followed by forging strategic healthcare partnerships on the site.

Goal 2 Create a Sense of Connection with the Community

The new campus framework plan will encourage an open and welcoming environment of health and wellness. The new ASH campus will focus on engaging the community that surrounds it by creating accessible public spaces and street design that includes generous tree-lined sidewalks in order to encourage engagement with residential neighborhood.

Goal 3 Create incentives for strategic partnerships

The ASH Brain Health Campus Master Plan calls for replacing the outmoded ASH buildings with a modern inpatient facility and a strategy to operationalize the broader redesign of the care continuum within this service area. Creating an attractive and user-friendly brain health campus can be an incentive for strategic partners to locate on campus. By so doing, the campus will help to destigmatize the care of people with mental illnesses, fostering greater empathy and acceptance of these common conditions.

Goal 4 Enable a Continuum of Care

The master plan will establish a framework infrastructure, and environment that will enable partners to co-locate on the ASH campus enhancing collaboration towards the goal of the full continuum of services that are needed. Partnership facilities that might be co-located on the ASH campus as part of the continuum of care strategy might include:

- Acute/Short Stay Inpatient Psychiatric Hospital
- Skilled Nursing/Memory Care
- Urgent Care/Crisis Program
- Transitional Housing
- Therapeutic Housing Facility
- Ambulatory Care Center and Departmental Offices
- State Hospital Laboratory Replacement Facility

Hospital Space Need Breakdown

Service		Enhanced Model SF	Median Facility SF
1	Inpatient Area	215,232	204,470
2	Centralized Treatment	29,391	25,129
3	Administrative and Education	37,936	32,246
4	Medical Services	16,629	14,234
5	Support Services	27,077	23,015
	<i>Sub-Total Department</i>	326,265	299,094
	Shared Circulation (3%)	9,788	8,973
	Floor Plate Allowance (11%)	35,889	32,900
	Mechanical (11%)	35,889	32,900
TOTAL		407,831 BGSF	373,867 BGSF

BGSF = Building Gross Square Feet

Hospital Program and Site Accommodation

Programming Process

Page and architecture+ collaborated on developing alternative program models for the new psychiatric hospital and incorporated input from the ASH Brain Health Redesign Steering Committee. The program builds on architecture+'s modeling tools and their database for psychiatric hospitals which includes a significant number of medium to large psychiatric hospitals built in North America during the past 20 years.

Hospital Program

The table to the left summarizes the space needed for the hospital based on several models that grew out of the architecture+ dataset. These models were used to guide the process of determining an appropriate size and cost for the proposed hospital based upon the hospital's own clinical drivers, a review of peer benchmarks, and the application of a predictive modeling tool developed using the architecture+ dataset. This process allowed the planning effort to be cognizant of the minimum, maximum (enhanced), and probable (median) sizes of the proposed hospital. These modeling and benchmarking exercises were supplemented by the development of the program areas having the largest degree of variability, the inpatient units, neighborhood treatment areas, and the centralized treatment mall. Deliberations that were a part of this process lead to the conclusion that a median facility model was the appropriate basis for planning the new hospital.

Inpatient Area

The inpatient area, consisting of living units and treatment neighborhoods, will be designed to promote healing and reduce aggression. Increased privacy of single rooms reduces stress, which in turn, promotes healing. The facility will have private bedrooms and bathrooms in small, flexible inpatient pods within the nursing units. Private rooms are critical to the success of the treatment process.

Centralized Treatment

Treatment diversity and access will be facilitated by the development of a treatment mall at the level of the hospital as a whole. The mall will supplement the neighborhood treatment areas. The mall and access paths are significant planning drivers with respect to location and secure circulation patterns.

Administration & Education

Administrative spaces will include offices, conference space and staff respite areas. Staffing efficiencies are key to a meaningful investment of the State's budget in treatment. Efficient hospital design plans will reduce staffing needs and allow the redirection of the staffing investment to direct care for the patients.

Medical Services

The medical clinic is programmed to support 350 patient encounters per month. In addition to the medical clinic, the space will include physical therapy, laboratory processing, pharmacy and radiology.

Support Services

Support services will include the typical items to support the operation of a hospital, including nutrition services, housekeeping, linen, communications, safety, work control, maintenance, transportation, grounds keeping and miscellaneous shared support.

Best Practices and Research

The program, site, and cost modeling that undergird the master plan all anticipate that the hospital’s success will depend upon a design and planning effort that embraces a number of critical best practices in clinical care, environmental support, and facility support services configuration. Accordingly, the cost model, program, and building configurations have been carefully considered so that the siting, scope, and budget for the process can support all of the best practice and research informed features.

Organizational Models

The new hospital is organized in a House-Neighborhood-Downtown model for brain health facilities with the creation of smaller cluster-based inpatient treatment settings within larger inpatient units. In this model, the “house” refers to the inpatient bed, the “neighborhood” to the unit of typically 24 inpatient beds, and the “downtown” to the shared services and amenities for all units in the facility. This organizational model is the product of extensive research, collaboration with clinicians, interaction with people receiving care and their families, continuing observation, and imagination about the potential for environments to support healing.

Numerous hospital organizational configurations were tested to establish the site area required for the hospital and best location on the ASH site. Given the need to keep the existing hospitals operating and in order to not displace the extensive HHSC facilities in the northern half of the site, the southwest quadrant was selected as the most feasible hospital site. The more compact two- or three-story option for the hospital is recommended for operational efficiency, to reserve valuable land for healthcare partnership uses, and to keep the option open for the extension of 43rd Street as an access and service drive. The site tests demonstrate that the resulting 15-acre hospital site is more than adequate to accommodate the new hospital.

Hospital Implementation

Cost Estimate and Schedule

The master plan methodology utilized to determine anticipated costs for the replacement hospital and its' associated site development included the creation of two separate cost estimates, each done by different entities on the master planning team. The cost estimates were compared and reconciled to generate anticipated costs that will be incurred to implement the project. These provide a best estimate for legislative planning during the next biennial budget session.

Because the future replacement hospital site is encumbered with numerous existing buildings and infrastructure requiring removal of hazardous materials, possible utility replacement or upgrade, and demolition, estimates to implement the project include costs to clear or relocate those elements from the site of the new facility. This issue must be factored in if unit cost comparisons are made relative to other similar type projects. Along with costs for building abatement and demolition mentioned above, structures that are to be removed house existing services that must be addressed in order to maintain ASH and other HHSC operations during construction of the new hospital. Development of strategies to maintain operations in each of the uses will have cost impacts to this project that have been included.

The 240-bed hospital building (373,900 building gross square feet) cost is estimated to be \$ 282,680,000. The \$13 million planning phase funding that has already been appropriated to the ASH Redesign is deducted from the estimated project costs above.

A schedule has been prepared for completion of hospital construction by 2023. The preliminary schedule indicates that it may be necessary to implement some early action projects, including developing interim support facilities, site preparation, abatement, demolition, and utility relocation.

Campus Plan

Campus Framework

The master plan establishes a framework and environment to motivate partners to co-locate on the ASH campus. The established extension of the grid of streets defines flexible development areas with increased access to adjacent arterial streets. To maximize opportunities for partnerships to locate on the ASH campus and to optimize the value of this HHSC land resource and allow preservation of trees and green space, multi-story facilities and phased structured parking are recommended. Compact development will also maximize the efficiency of infrastructure investment.

The campus framework principles below are intended to create a renewed sense of place and support land stewardship:

- Reinforce campus presence on Lamar Boulevard, Guadalupe Street, and 45th Street.
- Connect to the city grid and surrounding community by creating great urban, walkable streets.
- Create signature campus-oriented open spaces and establish a central campus square as a focal point for the hospital, campus, and surrounding buildings.
- Create accessible urban roadway spine connecting the north and south parts of the site.
- Preserve existing campus assets including mature trees and historical buildings, where feasible.



Illustrative Plan

The illustrative plan provides a vision of the future brain health campus to achieve the identified goals to the fullest extent.

Land Use

Land use districts provide desired adjacencies and help organize functional areas of the campus. Healthcare partnership areas to provide for a continuum of care are concentrated north of 43rd Street and south of 41st Street. The hospital is located along Lamar Boulevard south of 43rd Street. Preserved areas include the pecan grove, east entrance, and areas near Building 501. Newly defined open spaces include the campus square and community park expansion of the open space at the south end of the campus.

Circulation

The north-south campus spine provides an organizational structure for the campus, a framework for future adjacent redevelopment, and enhanced access from 45th Street.

The master plan provides for the future extension of 43rd Street and 44th Street through the site to provide additional access to partnership areas for service and emergency vehicle access. A new access point to the designated community park area is afforded by 41st Street.



Open Space

Preserved open space areas include the pecan grove, east entrance, and areas near Building 501. Newly defined open spaces include the campus square and community park expansion of the open space at the south end of the campus.

Sustainability and Resilience

The sustainability and resilience framework provides ASH and HHSC with a number of strategies that will result in a more sustainable and resilient campus.

Site Phasing

A phasing sequence begins with the proposed hospital site preparation and relocation of ASH and HHSC services currently on the hospital site followed by hospital construction. Healthcare partnership development is then enabled by the demolition of the existing ASH facilities and infrastructure development. Redevelopment of the area north of 43rd Street alignment will happen in a phased way as development sites are needed.



ASH Brain Health Campus

New Hospital



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1

Introduction

- Background
- Team Organization
- Process

Background

The ASH Brain Health Campus Master Plan represents a unique opportunity to create a model environment for the continuum of brain health care in Central Texas. The plan seeks to accommodate a new, person-centered hospital on the historic campus with opportunities for healthcare partnership in close proximity.

The Austin State Hospital (ASH) campus dates back to 1857, with the construction of the original hospital building that remains on the site today as the current administration building for the hospital and a State Antiquities Landmark. The major period of development on the campus saw numerous buildings constructed from the late 1890s all the way through the early 1970s, representing a broad spectrum of psychiatric care facility design. However, since 1973, only three small structures have been added, and many of the existing facilities have deteriorated over time.

Though located outside the city upon its initial construction, the current campus of approximately 95 acres is now situated within the center of Austin, with vibrant residential neighborhoods, mixed-use development, and busy vehicular corridors on all sides. Yet the campus building stock is predominantly inward focused, separating itself from the adjacent context. The master plan process seeks a campus configuration that will appropriately integrate with the community while providing patient privacy and comfort as needed. This effort is meant to normalize the activities of the hospital within the community, thereby reducing the stigma of brain health care. Note that the terms “brain health” and “mental health” are used interchangeably throughout this document, with brain health taking precedence as a stigma-reducing term.

Team Organization

The campus master plan process was a collaborative effort between the planning team, the ASH Brain Health Redesign Steering Committee, and the Facilities Planning Subcommittee with the intent to appropriately integrate the physical framework projections for the campus with the vision and operational structure set forth by the Steering Committee.

The primary objective of the plan was to outline a strategy for replacement of the current hospital functions and to provide a long-term vision for the build-out of the campus. This will provide the continuum of care necessary for the future of brain health in Austin and the 75 counties in its Service Area.

The master planning effort was led by planning and healthcare experts from Page in partnership with psychiatric facility specialists from architecture+ and hospital cost estimators from Vermeulens. The team met regularly with the Steering Committee, Health and Human Services Commission (HHSC) leadership, and chairs from all master plan subcommittees. Specifically, a series of four work sessions were held with the Facilities Subcommittee during a three-phase planning process that involved analysis and exploration of planning, program, design, and technical issues. Although the plan covers numerous logistical and implementation topics regarding the new hospital, future analysis is recommended for the full build-out of the campus. This includes transportation and parking analysis, a campus infrastructure plan, wayfinding study, and urban design/land use guidelines.

Austin State Hospital Brain Health Redesign Steering Committee

- Health Related Institution: Steve Strakowski, M.D. (Chair)
- HHSC: Tim Bray
- Local Mental Health Authority: David Evans, Andrea Richardson
- Healthcare District: Mike Geeslin
- UT Design Institute for Health: Beto López
- UT System, Health Affairs: David Lakey, M.D.
- Texas Hospital Association: Sara González
- Texas Organization of Rural & Community Hospitals: Scott Briner
- Law Enforcement: Dennis Wilson
- Peer/Family Representative: Karen Ranus, Jason Johnson
- Ex Officio: Jim Baker, M.D., Sandy Guzman, Octavio Martinez M.D., Lisa Owens, David Rea, Katherine Jones, Martin Harris, M.D.

Subcommittee Chairs

- Campus Master Plan Subcommittee: Steve Strakowski, M.D.
- Integrated Service Design Subcommittee: Beto López
- Facilities Planning Subcommittee: Steve Strakowski, M.D.
- Policy & Legislature Coordination Subcommittee: Sandy Guzman
- Communication Strategy Subcommittee: Katherine Jones
- Finance Subcommittee: David Evans
- Academic Integration Subcommittee: Jim Baker, M.D.
- LMHA Work Group: Andrea Richardson, David Evans
- Community General Hospital Work Group: Scott Briner, Sara Gonzalez
- Peer/Family Work Group: Karen Ranus, Greg Hansch
- IT Integration Work Group: Steve Steffensen, M.D.
- Historic Preservation Engagement Group: August W. Harris, III

Planning Team

- **Page** Project Lead: Architecture, Planning, Urban Design, Landscape
- **architecture+** Space Programming
- **Vermeulens** Cost Estimating

Project Delivery

- UT System Office of Facilities Planning and Construction

Process

The master plan process consisted of an iterative, three-phase approach of Discovery, Exploration, and Synthesis.

The first phase, Discovery, involved a physical analysis of the campus that built on existing data and the consultant team’s evaluation of current conditions, as well as HHSC and the Steering Committee’s strategic priorities. This phase involved the review and evaluation of several previous reports on the ASH site and other State hospitals, including “A Texas Hospital: Planning Modern Psychiatric Care Facilities” by the Center for Sustainable Development at The University of Texas at Austin School of Architecture. The Discovery phase also included a programming effort for the new hospital and projection of continuum of care opportunities.

The second phase, Exploration, articulated planning principles and an overall vision that confirmed the campus framework, related planning systems, and recommended campus design and development strategies for various land use areas, as well as the campus’ relationship to residential neighborhoods adjacent to the campus. It included multiple site test fits for the replacement hospital on various quadrants of the campus with specific configuration alternatives on the selected quadrant. This phase also explored the potential for gray box development. The term “gray box” refers to healthcare partnership opportunities that support the continuum of care but in which the specific partner is yet to be determined.

Synthesis, the third phase, incorporated the findings of the prior two phases to develop a cohesive plan and vision for a brain health campus of the future. This phase focused on refinement and detailed documentation of the final plan, which is documented with the goal of informing future coordinated decision making.

Regular monthly meetings with the Steering Committee, Facilities Planning Subcommittee, and Committee Chairs were attended by the campus master plan consulting team throughout all three phases of the process. Additional topic-specific meetings were conducted as needed with HHSC leadership and ASH employees.



Image: Page / Internal work session.

Process

1. Discovery

Specific tasks include:

- Data Collection
- Site Analysis
- Campus Orientation
- Vision Session
- Circulation/Parking Review
- Space/Program Projections
- Opportunity Sites
- Executive Review

The Discovery phase involved one work session with the Facilities Planning Subcommittee to review the site analysis and preliminary program development. Much of this critical early work was already being completed by the Brain Health System Planning teams, outlined in the previous planning chart.

2. Exploration

Specific tasks include:

- Alternatives Presentation
- Program/Building Locations
- Open Space
- Circulation/Parking Systems
- Sustainability and Resilience

Two work sessions were held. The first reviewed a preliminary framework plan for the campus, hospital location options, hospital height considerations, and historic buildings prioritization. The subcommittee agreed to the placement of the hospital within the southwest quadrant, to be multi-story, and that the framework plan was the correct approach to campus organization.

The second work session in this phase reviewed possible hospital configurations in the southwest quadrant, a more detailed framework plan, phasing and gray box development alternatives, and the cost estimating approach. The desired phasing was confirmed and criteria for the eventual hospital configuration was discussed.

3. Synthesis

Specific tasks include:

- Draft Plan Development
- Final Documents

The Synthesis phase included a final work session with the Facilities Planning Subcommittee. This work session reviewed remaining open issues such as the necessary relocation of service facilities in the southwest quadrant for construction of the new hospital. It also included an update on cost estimates and final program numbers for the hospital facility. The draft plan document was presented during the session. The outcome was an agreement on the approach to service facility relocation and the relative impact on the project budget. The session also confirmed the target square footage for the hospital.



2

Master Plan Goals

Master Plan Goals Overview

The new Austin State Hospital (ASH) Brain Health Campus Master Plan identifies the opportunity to rethink the care model and delivery for brain health throughout the state of Texas. The initiative will begin by creating a campus environment that fosters partnerships to create a continuum of care within the heart of Austin, Texas. Improving brain health services and integrating with the surrounding community will allow the new ASH to serve as a model of wellness care for those in Central Texas and beyond.

The ASH campus is the right place to begin the integration necessary to realize Texas' vision of a revitalized, optimally-funded, high-quality brain health system. The ASH facilities currently only provide acute, inpatient services, but the area this facility serves does include collaborative regional leadership among local mental health authorities, hospital districts and other safety-net hospitals, legislative leaders, HHSC, community business and philanthropic leaders, and the new Dell Medical School. The goal, therefore, is to establish a continuum of inpatient and outpatient brain health services anchored on the ASH campus to drive systemic improvements in full partnership with existing behavioral health systems throughout the Central Texas service area.



Goal 1

Create a brain health campus



Goal 2

Create a sense of connection with the community



Goal 3

Create incentives for strategic partnerships



Goal 4

Enable a continuum of care



Goal 1

Create a brain health campus

In order to establish a brain health campus, the ASH Brain Health Campus Master Plan recognizes the initial need for replacing the outmoded ASH buildings with a modern inpatient facility. The master plan establishes a program for a minimum 240-bed hospital facility, budget estimate, schedule, and identifies the preferred site for the new hospital, while maintaining the existing hospital operations until the new hospital is complete. This facility will be the first step, followed by forging strategic healthcare partnerships on the site.

The framework plan also identifies aging buildings that have outlived their intent to be removed to make way for newer facilities. Historically significant structures will be rehabilitated and re-purposed to create synergy within the context of ASH's strengthened mission and identity, when appropriate.



Goal 2

Create a sense of connection with the community

The new ASH campus will focus on engaging the city and community that surrounds it by creating accessible public spaces that integrate exterior greenscapes in order to encourage engagement and use by the neighborhood population.

In contrast to the traditional walls and security barriers that maintain separation, the new campus framework plan encourages an open and welcoming environment of health and wellness. Extending the established grid of streets enhances site access by improving connection to adjacent vehicular arteries, while the proposed street design includes generous tree-lined sidewalks to encourage pedestrian circulation between uses within the campus and to the surrounding residential neighborhood and commercial uses.



Goal 3

Create incentives for strategic partnerships

The ASH Brain Health Campus Master Plan calls for replacing the outmoded ASH buildings with a modern inpatient facility and a strategy to operationalize the broader redesign of the care continuum within this service area. Creating an attractive and user-friendly brain health campus that can be an incentive for strategic partners to locate on campus. By so doing, the campus will help to destigmatize the care of people with mental illnesses, fostering greater empathy and acceptance of these common conditions.



Goal 4

Enable a continuum of care

Although replacing ASH with a new facility is a critical and necessary first step, this step alone will not produce the optimal brain healthcare system for the people of Central Texas. It is imperative that the campus plan encourages and motivates partners to collaborate towards the goal of the full continuum of services that are needed. The new acute care hospital will address the critical need for innovative and transformative longer stay inpatient care. However, other needs remain, such as:

- Public Education/Community Outreach
- Transitional Housing
- Partial Hospitalization/Day programs
- Outpatient Services
- Acute/Short Stay Inpatient
- Skilled Nursing/Memory Care
- Family and Caregiver Support
- Care Coordination

The framework plan addresses these items through the previously mentioned strategies of collaborative partnerships and flexible development strategies within the campus property.

3

Hospital Accommodation

- **Space Needs Assessment**
- **Recommended Program**
- **Hospital Organizational Models**

Space Needs Assessment Methodology

Treating the Whole Person: Implications for Hospital Planning

When understanding challenges and trends across the whole spectrum of healthcare delivery, there are many commonalities among each specialty: access to information, continuum of care, workspaces for physicians, nurses and staff, and overall experience for patients, family, and clinicians. These implications are how the design of the environment respond to each group's unique individual needs.

Recent data shows that depression and other brain health disorders account for some of the world's largest health problems. It is important to consider the correlation of these issues with the design goals and objectives for ASH in order to carry this into the broader continuum of care. Brain health services are broader than a "one size fits all" solution.

Brain health issues no longer carry the stigma that they once did. Awareness campaigns and new research have helped improve our understanding of the brain – and how to design for its health – in the 21st century. In recent years, the design industry has confirmed the large impact physical environments have on patient outcomes and staff productivity, especially in brain health facilities. We have moved away from solely focusing on seclusion, security and safety to designing welcoming environments that promote emotional, physical and psychosocial well-being.

This means implementing biophilic practices, choosing people-centered care as opposed to control-focused care, and creating a healing space while adopting the needed safety and security factors. These trends have led to the idea of creating brain health facilities that resemble communities rather than institutions. They are a collection of spaces that replicate a real life environment in which people will live after treatment, making the inside represent the community outside. Flexible care models allow hospitals to provide connectivity and comfort for people receiving care, while easing communication and wayfinding for visitors and staff.

Design centered around these communities helps to promote interaction among patients, staff, visitors, and family members, keeping individual wards from becoming isolated. Fewer places of confinement and more places of treatment and preparation for return to the outside world is imperative.

Patient health and safety are paramount. While designing these inviting facilities, one must think how to best ensure a therapeutic environment without compromising security and the dignity of people receiving care. Design options considering the above factors can be done through unobstructed and unrestricted sight lines or nurse stations and support rooms located centrally for visibility and sense of safety.

Space Needs Assessment Methodology

A building is far more than the physical materials from which it is constructed. A building is a world, and in designing that world we inevitably make a statement about what we consider important. If we care about the needs of the building's users, then it only makes sense to place them at the heart of the process.

The Neuro-Psychiatric Convergence

The clinical research underway is rapidly leading to an understanding that mental illness is biologically- and brain-based and that the symptomology is secondary. Early diagnosis and treatment of the underlying illness changes the course of the disease and the prevalence of symptomology and disability.

Violence and Aggression Reduction

Recent research (Ulrich, Lundin et al) identify ten intertwined environmental features that individually and collectively contribute to a reduction in patient violence and aggression. The following are significant features identified in this research that are reflected in the space programming and physical modeling used to establish this master plan:

- Minimize overall unit size to the greatest extent possible and within efficient units create smaller, inpatient autonomous sub-units housing 6-8 patients.
- Provide private bedrooms with ensuite bathrooms.
- Create day rooms and lounges providing a range of seating and setting choices.
- Establish views of nature.
- Grant access to the outdoors (especially porches, yards and courtyards).
- Optimize patient privacy (and control).

Space Needs Assessment

Best Practices and Research

The program, site, and cost modeling that undergird the master plan all anticipate that the hospital's success will depend upon a design and planning effort that embraces a number of critical best practices in clinical care, environmental support, and facility support services configuration. Accordingly, the cost model, program, and building configurations have been carefully considered so that the siting, scope, and budget for the process can support all of the following best practice and research informed features.

Recovery and Active Treatment

- Milieu therapy and setting
- Stigma reduction: access and efficacy
- The role of hope and recovery and implications for design
- Range of knowing's and understanding's including insight
- The role of a range of settings and resources in a person-centered recovery-based treatment program and
- DOJ consent decrees and active treatment targets
- Active treatment locus and participation rates.
- Effectiveness of active treatment in mall settings
- Direct care staff span of control, migration with patients and participation rates
- Boundary crossing: Fear, emergence, learning
- Travel distance
- Neighborhood and downtown treatment Malls as a response to all of the above
- Peer support

- Access to D&T facilities likely to become more like general hospitals over time.

Treatment Malls

During the 1980's, 1990's, and the early part of this century, virtually every large state hospital has (or had) a free-standing recreation or rehabilitation building. These buildings generally had the campus' library, recreation center, gymnasium, pool, bowling alley, and a number of arts, crafts, educational, and vocational programs. Over time, as state hospitals downsized and lengths of stay shortened, these building became progressively empty and underutilized. The combination of increased patient acuity and the costs associated with moving patients across campuses to these facilities were daunting.

architecture+'s exploration of the idea of treatment malls dates to the middle 1980's and arose out of a consultation with the State of New York about the development of a new treatment model developed of a patient cohort that was identified as not needing state-hospital care, but likely to flourish and transition successfully if housed in a 52-bed residential setting with on-site supports. In developing this prototypical Residential Care Center for Adults model, the team traveled widely and consulted extensively with practitioners and researchers within New York State and beyond. Among those consulted was Dr. Richard Lamb, a distinguished professor at USC's Keck School of Medicine. Dr. Lamb shared his

Space Needs Assessment

Best Practices and Research

research¹ on Board and Care Homes in California and emphasized the importance of a nearby and distinct treatment setting for day programs. Distinct programs were important because the distinct setting modeled community settings for work, school, and treatment and set up behaviors and expectations that made patients readier to completely return to the community. Proximity was equally important; that the farther away the treatment site was, the less likely patients were to attend the treatment program.

During the 1990's, a series of federal Department of Justice Consent Decrees were entered into guaranteeing that institutionalized patients would receive a minimum number of active treatment hours per week. The mechanics of “proving” that active treatment was being provided and institutional needs to change behavior patterns began to favor establishing distinct settings and times for active treatment for some hospitals. In general, hospitals developed a minimum average active treatment hour target of 20 to 24 hours per patient week (consistent with those DOJ consent decrees) with many hospitals targeting a 30-hour target as desirable.

The development of Psycho-Social Rehabilitation (PSR) and recovery-based treatment models created an interest in providing a greater diversity of tailored treatment settings than could be accommodated efficiently within most inpatient units.

In 1993, the first treatment mall in the United States was developed at New York State's Middletown Psychiatric Center. A retrospective study² discussed the positive outcomes arising from the use of treatment malls.

An examination of participation rates in treatment malls suggested that locations closer to inpatient units would both increase participation and would do so within space more likely to be within the span of control of direct care staff who would then be more likely to move with patients to the mall. The first neighborhood-based treatment mall was developed at the Rochester Psychiatric Center, which opened in 1995. Staffing and patient utilization analyses of this project show higher utilization rates with a more optimized staff utilization pattern.

Further explorations on a number of later projects lead to a conclusion that the physical space for close-in (or neighborhood) treatment malls could be largely constructed using space that need not be duplicated on the adjoining inpatient units: group rooms, activity rooms, consult rooms. In the ultimate development of these models, patient access and program diversity are maximized with nearly identical investments in staff and infrastructure with treatment located solely on-unit.

¹ *Maximizing the potential of board and care homes*, HR Lamb, New Directions for Mental Health Services 1981 (11), 19-34

² *Re-engineering the State Hospital to Promote Rehabilitation and Recovery*, Bopp, Ribble, Cassidy, Markoff, Psychiatric Services July 1996, Vol 47, No7, p.697

Space Needs Assessment

Best Practices and Research

Human Response and Healing

- Privacy and choice
- Privacy, noise and sleep
- Choice and social density and self-protection
- Use of the milieu to model learnings and gain insight
- The normative familiar (and stigma)
- Biophilia: Positive distraction, natural light, natural materials, views, access to the outdoors
- Natural navigation

Patient Safety

- CMS and Joint Commission Initiatives
- NYS-OMH Standard Patient Safety Guide as reference standard for FGI
- Undergirding research
- Normative environmental focus
- Cost projections embed currently projected increases due to market place pressures and scarcity.

Security

- Passive security
- Seeing vs understanding
 - “The best security lies in knowing my patients” Dr. Marvin Chapman
- Zones, portals and paths
- Active security

Violence and Aggression Reduction³

- Reduce Crowding: social density and spatial density
- Unit size and sub-clusters
- Single patient bedrooms with private bathrooms
- Ample communal space and meaningful choice
- Noise reduction
- Patient control/choiceFu
- Visibility
- Outdoor access
- Views of nature
- Natural Art
- Natural daylight

Functional Efficiency

- Reducing staffing costs for support services through the use of proximity and connectivity allows for reallocation of scarce resources to direct care of patients

Flexibility

- Unit size in beds
- Gender and clinical mix
- Treatment setting
- Unit assignment by age or diagnosis
- Mission
- Repurposing

³ *Psychiatric ward design can reduce aggressive behavior*, Ulrich, Borgen, Gardiner, Lundin, Journal of Environmental Psychology 57, 53-66. doi:10.1016/j.jenvp.2018.05.002

Recommended Program Elements

Treatment Objectives

The new hospital will operate with an integrated biological/neurological and psychiatry-lead recovery-based treatment model with a trauma-informed and person-centered team approach. Treatment objectives will be personalized for each patient, but generally are driven to preparation for successful discharge back into the home community setting using a robust regional continuum of care.

Services Provided

Treatment Mall Elements

- Rehabilitation Leadership
- Occupational Therapy
- Recreation Therapy/Gym
- Music Therapy
- Library/Patient Education/Technology Center
- Patient Clothing (as necessary)
- Bank
- Barber/Beauty Shop
- Chapel
- Canteen/Gift Shop
- Transportation/Community Integration
- Outdoor Functions (i.e. basketball, walking, workout equipment)

Administration

- Nursing
- Social Services
- Medical
- Rehabilitation
- Medical Records
- Program Evaluation & Utilization Review
- Education & Training
- Business Office
- On-call Suite
- Safety

Support

- Stores
- Central Medical Supply
- Pharmacy
- Radiology
- Laboratory (simple test and sample processing)
- Nutrition Services
- Housekeeping & Linen
- Facility Maintenance
- Transportation
- Groundskeeping

Recommended Program Elements

Mental Health Courtrooms/Hearing rooms

- Teleconferencing facilities (to reduce need to transport people receiving care to other facilities for hearings)

Visiting

- Visiting facilities will be provided centrally to facilitate visitor access and staff supervision. Additional visiting should be provided in locations that meet the requirements of FGI Guideline 2.5-2.2.5 and 2.5-2.2.8.1 with respect to locations that are in or readily accessible to each nursing unit with at least one provided on each nursing floor.

Personnel

Community Relations

Information Services

Medical Clinics

PGME (Postgraduate Medical Education)

Research

Patient Advocates/Consumer Groups

Existing Campus Programs (Programs Supporting Mental Health or Leasing Space on ASH Campus)

- Austin Clubhouse
- Integral Care (LMHA)
- Bluebonnet Trails Community Services (OSAR Center)
- Communities for Recovery
- Heart of Texas (LMHA)
- National Alliance on Mental Illness (Austin Chapter) – NAMI
- National Alliance on Mental Illness (State Chapter) – NAMI
- Preservation Texas
- Austin Independent School District
- Austin/Travis County Crisis Intervention Team (ATC CIT)
- Travis County Court of Law Office of Probate

Future Campus Programs (Potential Continuum of Care Programs)

- Acute/Short Stay Inpatient Psychiatric Hospital
- Urgent Care/Crisis Program
- Community Health Center
- Therapeutic Housing
- Ambulatory Care Center and Departmental Offices
- State Hospital Laboratory Replacement Facility

Recommended Program Space Needs

The detailed analytical models and benchmarking developed for this hospital are exhibits in this document’s appendices. The results are summarized in the following table and basic organizational descriptions. The enhanced model represents a maximum facility size based on clinical drivers and peer comparisons. The median facility represents the necessary facility size to accommodate the requirements outlined in this document to provide innovative care and was the selected model for organizational test fits and cost estimating purposes.

Hospital Space Need Breakdown

	SERVICE	ENHANCED MODEL SF	MEDIAN FACILITY SF
1	Inpatient Area	215,232	204,470
2	Centralized Treatment	29,391	25,129
3	Administrative and Education	37,936	32,246
4	Medical Services	16,629	14,234
5	Support Services	27,077	23,015
	<i>Sub-Total Department</i>	326,265	299,094
	Shared Circulation (3%)	9,788	8,973
	Floor Plate Allowance (11%)	35,889	32,900
	Mechanical (11%)	35,889	32,900
	TOTAL	407,831 BGSF	373,867 BGSF

These numbers do not include treatment, administrative, and other support spaces sized for future expansion.

Inpatient Area

The inpatient area and its associated treatment neighborhoods will be designed to promote healing and reduce aggression. Increased privacy reduces stress, which in turn promotes healing. The facility will have private bedrooms and bathrooms in small, flexible nursing units. Living rooms, quiet rooms, comfort rooms, and on-unit dining areas are located immediately adjacent to bedroom wings. A wide range of daytime activities are to be accommodated within this space. This program area includes all clinical and administrative support spaces that are required to support the daily operations of the unit.

Centralized Treatment

Increasingly, clinical programs are focused on active treatment involving the delivery of at least 20 hours of clinical program per patient during a typical week. In such models, utilization rates, treatment diversity and access are facilitated by the development of treatment malls at the level of the hospital as a whole and the patient diagnostic cohort. These malls and access paths are significant planning drivers with respect to location and secure circulation patterns. The presence or absence of these malls will have an impact on the nature and number of clinical amenities made available on the inpatient unit itself.

Recommended Program Space Needs

Administration & Education

Administrative spaces will include offices, conference space and staff respite areas. Training, education, and retention have been identified as high priority project drivers. Staffing efficiencies are key to a meaningful investment of the State’s budget in treatment. It is important to craft plans that reduce the need for unnecessary staff and that redirect the staffing investment to direct care for the patients.

Medical Services

The hospital’s medical clinic needs to support 350 patient encounters per month. The clinic is available Monday-Friday 9am-5pm for primary care (doctors at 80 hours per week, nurse practitioners at 20 hours per week, and gynecologists at 16 hours per week). Dentists support approximately 500 on-site dental clinic visits per year, in addition to visits on the units. There is one dentist operating Monday-Friday 8am-5pm. The space also includes physical therapy, laboratory processing, pharmacy, and radiology.

Support Services

Support services include the typical items to support the operation of a hospital, including nutrition services, housekeeping/linen, communications, safety, work control, maintenance, transportation, groundskeeping and miscellaneous shared support.

Space Drivers: Behavioral Health Components



Level of Autonomy



Welcoming Environments



Controlled Security



Reduced Noise



Accessibility to Outdoors



Plentiful Daylight



Private Spaces



Social Access

Space Drivers: Organizational Components



Integrated Care



Evidence Based Design



Team-Based Treatment



Operational Flexibility

Recommended Program Regulatory Status

The Austin State Hospital is a Joint Commission Accredited facility. Like its peer State institutions, Austin State Hospital's operational mandate arises from the State's sovereign authority. It is, therefore, not a State-licensed facility. The hospital is additionally subject to the Centers for Medicare and Medicaid Services' (CMS) Conditions of Participation.

As an unlicensed facility, the hospital is not required to comply with the provisions of Texas Administrative Code Title 25, Chapter 134. However, it is required to comply with the following codes and standards that impact the planning and programming reflected in this master plan:

- The Joint Commission (TJC) Accreditation Standards
- The National Fire Protection Association (NFPA) 101 Life Safety Code and related codes and standards as mandated by the CMS.
- The International Building Code (IBC) and related codes as mandated by the Texas Administrative Code (TAC).
- The Facility Guidelines Institute (FGI) Guidelines for the Design and Construction of Hospitals as mandated by TJC.
- ANSI/ASHRAE 170 Ventilation of Healthcare Facilities as mandated by TJC.

Hospital Organizational Models

Organization

The new hospital is organized in a House-Neighborhood-Downtown model for brain health facilities with the creation of smaller cluster-based treatment settings within larger inpatient units. This organizational model is the product of extensive research, collaboration with clinicians, interaction with people receiving care for mental illness and their families, continuing observation, and imagination about the potential for environments to support healing.

Therapeutic treatment facilities (Neighborhoods) are arranged as the domain for people receiving care and are shared by multiple inpatient units. Viewable from the Neighborhoods, the Downtown provides activity centers along interior streets and squares, surrounding a secure outdoor communal activity space. The Downtown centralizes the most social activities, surrounded by quieter activities. The Downtown provides an active space containing resources that are shared by the entire hospital. This provides people receiving care with a sense of existing within a broader community while encouraging them to look outward to emergence from a clinical inpatient setting to life outside of the hospital.

The master plan process explored multiple hospital organizational configurations within the southwest quadrant of the campus in order to ensure that various concepts can be accommodated once the hospital is designed. Within the quadrant, the various configurations explore both retaining and removing buildings that have been identified through other studies as potentially historic. The final determination of these buildings will be made during the hospital design phase, but a retention decision should include functional occupation of these buildings.

Hospital Organizational Models

Organization

The master plan does not propose a specific concept to be selected for the final hospital design. However, each of these configurations was explored to test a set of planning criteria that are intended to guide the eventual hospital design and to develop a sound anticipated cost estimate. These criteria include the following principles:

- The hospital massing (the shape, height, and form of the building) should respond to the city and campus grid in a manner that integrates the facility with the surrounding community and defines strong urban street and public space edges.
- The primary hospital entrance should be located adjacent to the future campus square.
- Hospital loading and service access should be provided near the intersection of Lamar Boulevard and 43rd Street.
- The extension of 43rd Street should be maintained as a northern limit of construction in order to maximize future flexibility and partnership development on the site, while also minimizing the length of uninterrupted building facade along Lamar Boulevard that can be perceived as a barrier or wall to the campus.
- Exterior open space for the hospital should be accommodated to the greatest extent possible by introducing courtyards defined by the building edges rather than ancillary walls or fences. At least one large courtyard should be provided with enough space that employees and patients can exercise around its perimeter.

- Space should be allocated for future horizontal expansion of an additional bed tower.

The following pages outline the four configurations that were tested: T-scheme, spine scheme, courtyard scheme, and L-scheme.

Hospital Expansion

Due to the projected growth of the ASH service area, a need for additional beds may be required in the future. Each of the four configurations explored the allocation of ground space for a future bed tower to add 48 to 72 beds to the hospital, depending on the number of levels. The core space program model provides adequate central mall treatment space and facility administrative, clinical and support space to accommodate growth of an additional 48 adult beds (growth from 240 to 288 beds).

In addition to future hospital expansion, space is allocated for a standalone residential care facility of 48 to 72 beds. Proximity to the new hospital is important, and a potential location is shown in the campus plan just north of 43rd Street.

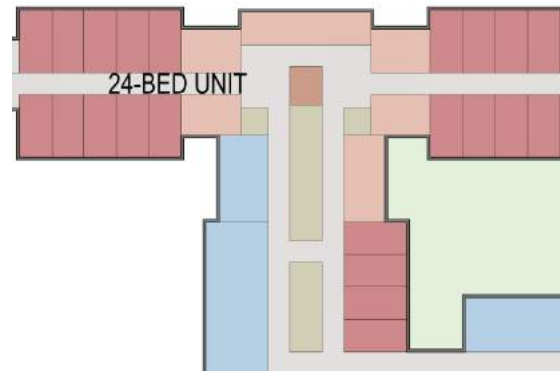
Hospital Organizational Models

Test Configurations

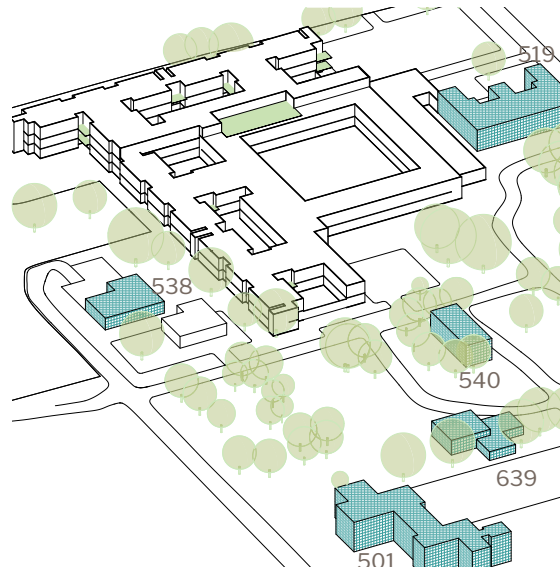
T-Model

This three-story hospital organization is compact and efficient in regards to circulation and shared space, while maintaining a smaller footprint on the site to allow for future expansion and development. Each patient unit is organized into three sub-clusters, 10-10-4. A separate circulation path that does not pass patient bedrooms allows for staff and material circulation into the heart of each bed unit without disrupting patients. There are internal courtyards for use at the house, neighborhood and downtown areas of the building, including a large central courtyard meant for more active use to include a long walking trail. This scheme utilizes existing building 519, repurposed for use as a support building, meant to house services like housekeeping, linen and maintenance.

Unit Layout



Axonomic View



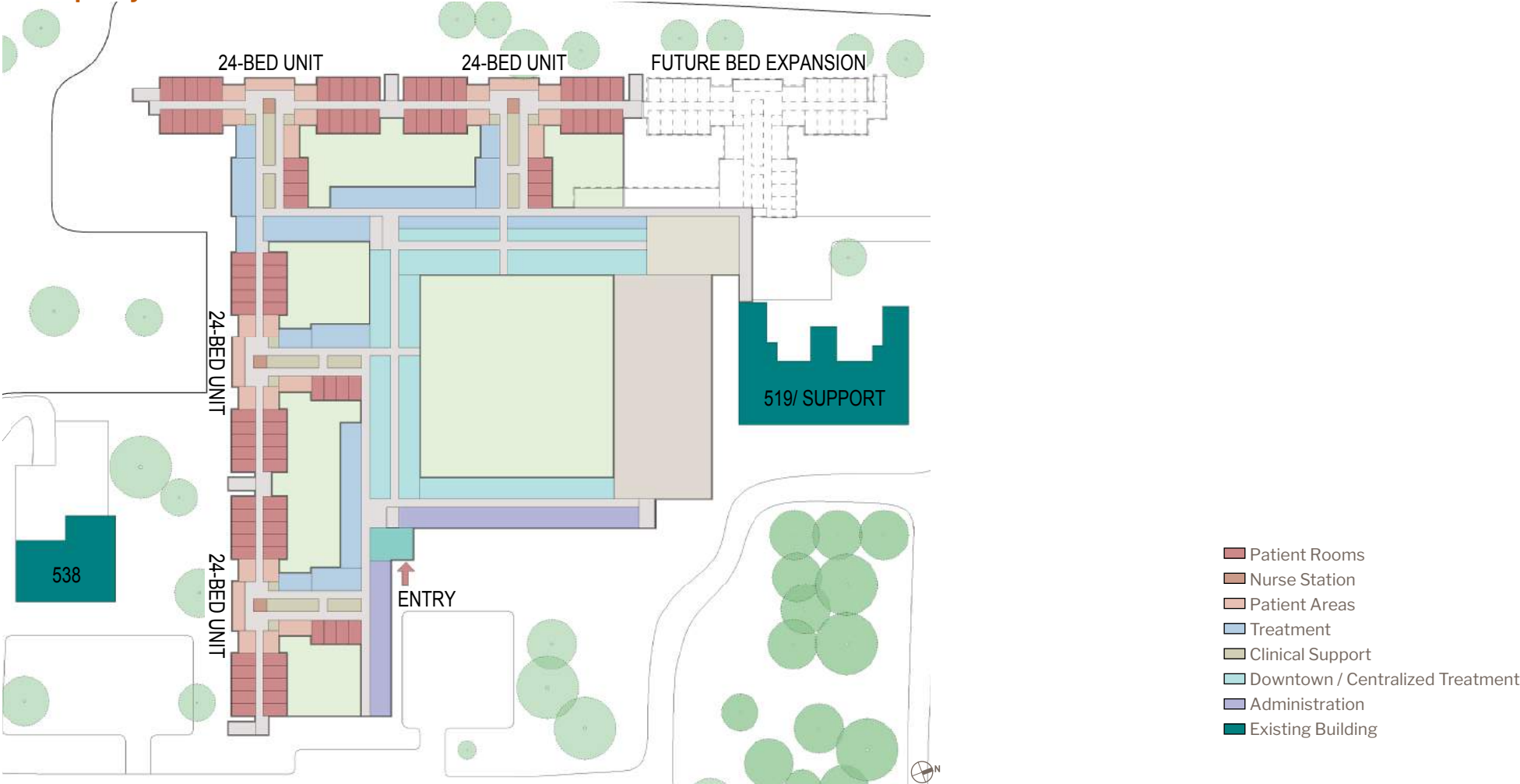
- Patient Rooms
- Nurse Station
- Patient Areas
- Treatment
- Clinical Support
- Downtown / Centralized Treatment
- Administration
- Existing Building

Hospital Organizational Models

Test Configurations

T-Model

Concept Layout



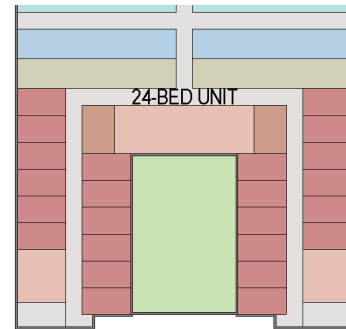
Hospital Organizational Models

Test Configurations

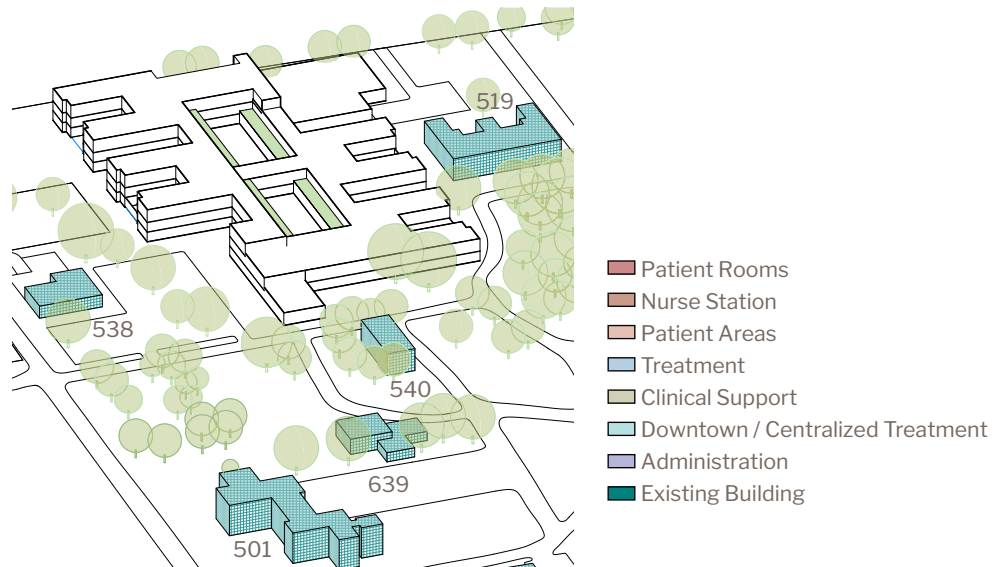
Spine Model

This three-story hospital layout organizes each 24-bed unit into a U-shape, with two 12-bed sub-clusters. This layout would require a more decentralized nursing model for proper observation of all 24 beds. This scheme proposes new construction for all hospital program, rather than incorporating the reuse of existing buildings on site. Though this scheme would potentially work as a two-story building, the allocation of land for the future expansion becomes difficult and would impede the future development of the campus per the framework plan.

Unit Layout



Axonomic View



Hospital Organizational Models

Test Configurations

Spine Model

Concept Layout



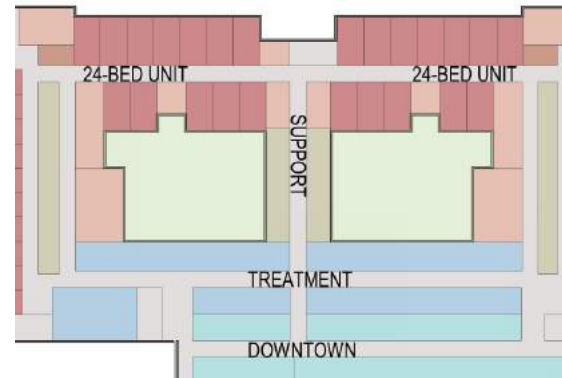
Hospital Organizational Models

Test Configurations

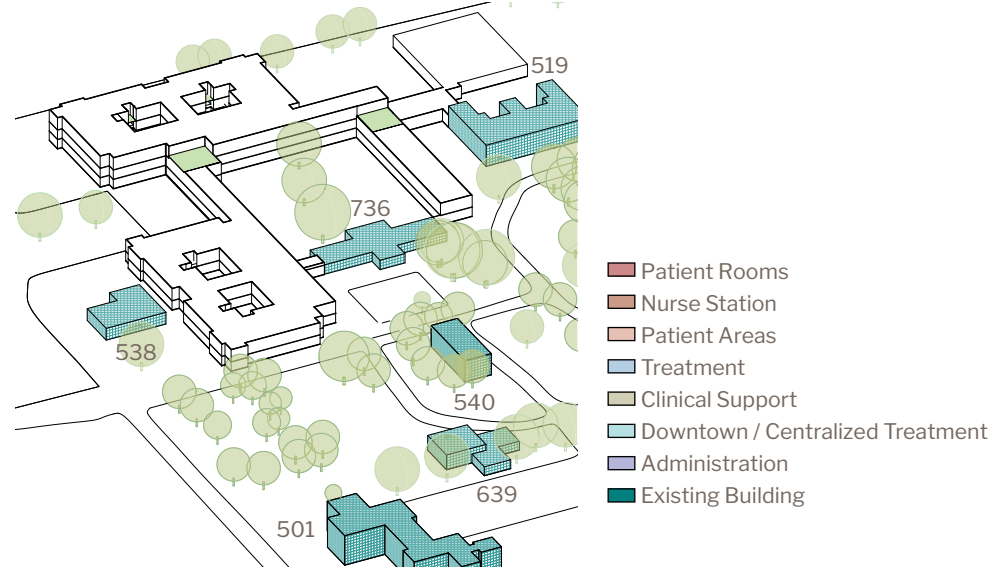
Courtyard Model

This three-story hospital layout organizes each two inpatient units around a central courtyard which is then split by shared support areas and clinical access to the units without traversing past patient bedrooms. The space required to organize the units in pairs around these courtyards results in longer overall travel distances in the facility. Each patient unit is organized into two 12-bed sub-clusters. This layout provides a single private courtyard for each 24-bed unit and an additional large central courtyard meant for more active use, including a long walking trail. As with each proposed scheme, this is laid out with a house, neighborhood and downtown organization. This scheme also utilizes two existing buildings, repurposing them for new use. Building 736 is intended to be used for administrative purposes, ideally suited for conferencing and education space. Building 519 is intended to be used for support services, ideally suited for linen, maintenance, and housekeeping.

Unit Layout



Axonomic View



Hospital Organizational Models

Test Configurations

Courtyard Model

Concept Layout



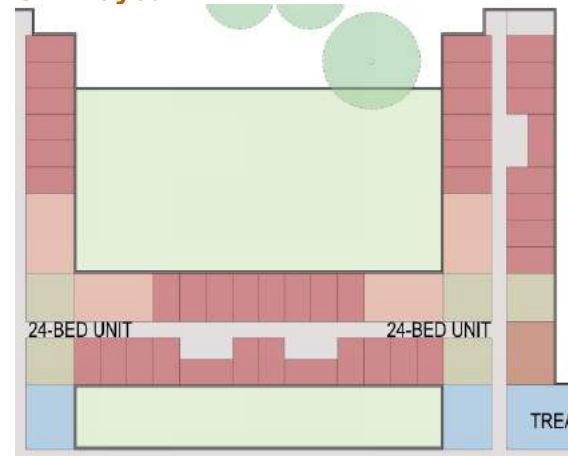
Hospital Organizational Models

Test Configurations

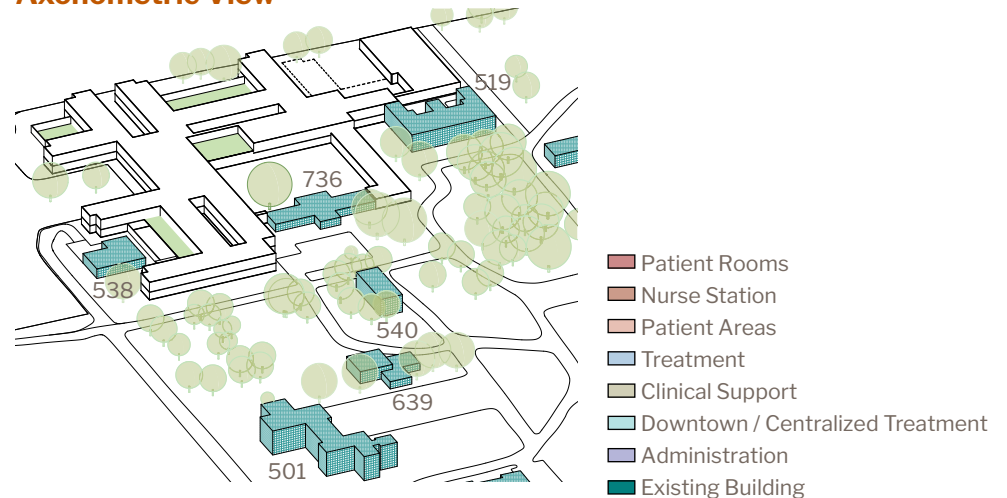
L-Model

This two-story hospital layout organizes each 24-bed unit into an L-shape, with two 12-bed sub-clusters. This layout allows for flexible beds between each 24-bed unit. Though compact, this layout has a greater number of treatment spaces without exterior wall for daylight. The medical services are located all on the first floor, as is the downtown, or centralized treatment, area. This scheme proposes the adaptive reuse of building 736 for conference, education and training, while the remainder of the administrative services are located on the second floor. This scheme also proposes the adaptive reuse of building 519 ideally suited for support services like housekeeping, laundry, maintenance, etc. Challenges in this scheme include the bed unit proximity to the existing electrical switchgear building, and the property line along the South, as well as a tight area for future expansion and bed wing addition.

Unit Layout



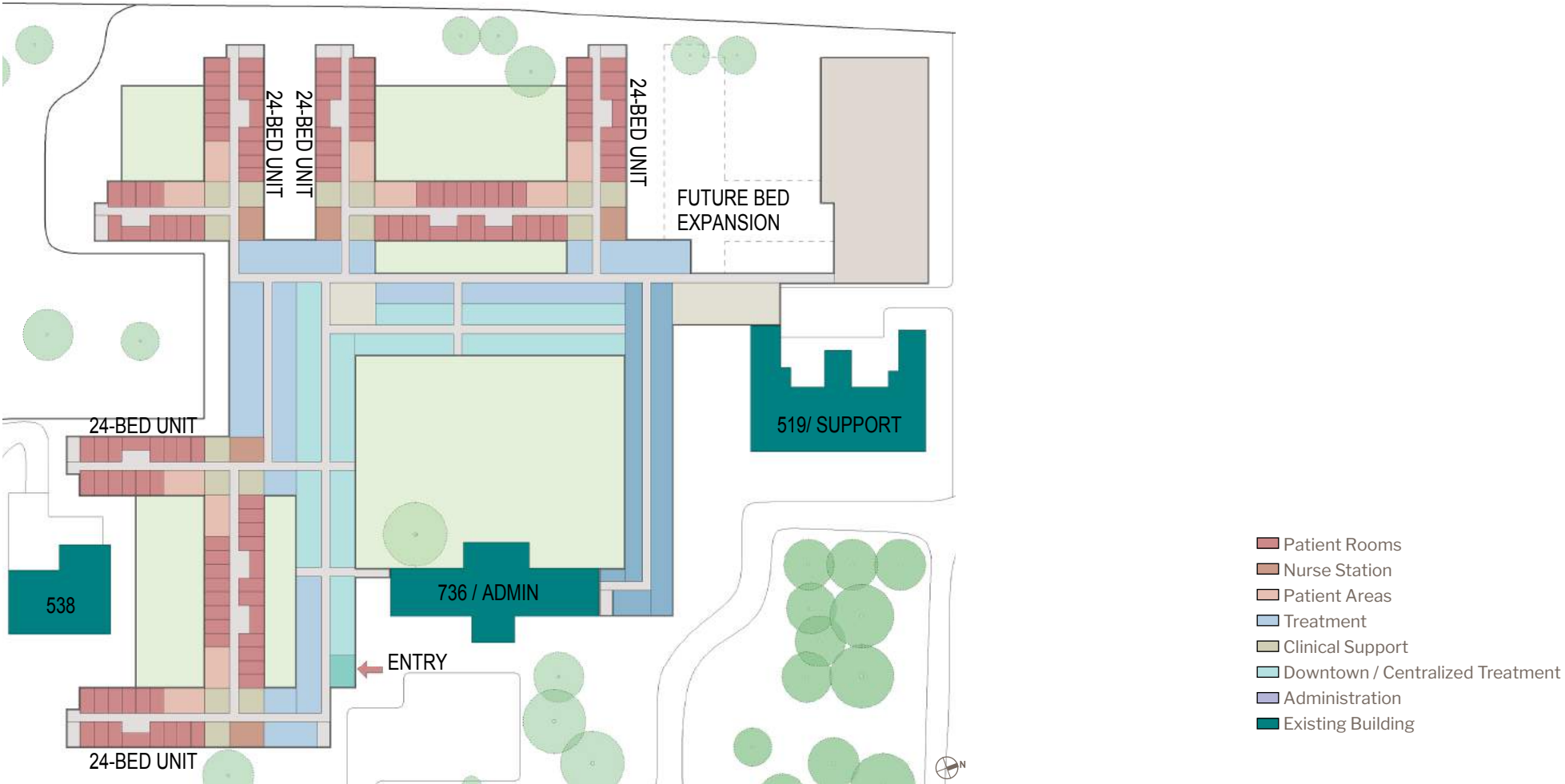
Axonomic View



Hospital Organizational Models

Test Configurations

L-Model



4

Hospital Implementation

- Estimating Methodology
- Implementation Details
- Cost Summary
- Schedule

Estimating Methodology

Estimating Methodology

The master plan methodology utilized to establish a budget for the replacement hospital and its associated site development included the creation of two separate cost estimates, each done by different entities on the master planning team. The first estimate relied on architecture+'s extensive project cost database of numerous similar type facilities across the United States and Canada. Projects in that database were adjusted by size, location, and time for the Austin market. The second estimate utilized detailed information that originated from assumptions specific to this project, including but not limited to, exterior wall material, exterior wall to floor area, and interior partition composition. That estimate was authored by Vermeulens, a national construction cost estimating firm, and included input from all of the master planning team. Once both estimates were completed, they were then compared and reconciled to generate our team's best idea of anticipated costs that will be incurred to implement the project.

The detailed estimate is provided in this document's appendix to provide all assumptions that were made in development of the estimate. This detail is significant to represent the master plan team's numerous assumptions that are directly linked to anticipated project costs. Information contained therein should provide the future implementation team a tool to assist in maintaining the established project budget once actual building and site design

commences. Both quantitative and qualitative assumptions are described in the detail portions of the estimate.

Market and Construction Escalation

Austin Texas has been, and is assumed to continue to be, a very busy and robust construction market. Because of this we have included within the cost estimates 1% per quarter escalation factor to the mid-point of construction, as well as a 5% factor for market conditions. Vermeulens has tracked market escalation for more than 40 years. The primary drivers in cost escalation are the growth rate and decline of construction labor in a market.

Build-Out Costs (Commonly Referred to as Associated Project Costs)

A list of other project related costs (referring to costs outside of construction costs) was generated and includes items specific to state mental health hospitals such as furnishings and equipment. Other costs include professional fees, construction quality assurance costs for materials testing and commissioning, and owner controlled contingency. Build-out costs have been shown as 32% of construction cost. This percentage is based on a study of individual probable costs as well as a reliance on history of past similar type projects.

Implementation Details

Project Cost Estimates

Cost estimates for this project are based on approximately 373,900 gross square feet of building and 15 acres of site development. Because the future replacement hospital site is encumbered with numerous existing buildings and infrastructure requiring removal of hazardous materials, possible utility replacement or upgrade, and demolition, estimates to implement the project include costs to clear those elements from the new facility site. This issue should be considered if unit cost comparisons are made relative to other similar type projects.

Along with costs for building abatement and demolition mentioned above, structures that are to be removed currently house facilities and services that must be addressed in order to maintain ASH and other HHSC operations during construction of the new hospital.

Critical facilities and services on the southwest quadrant of the ASH campus that must be addressed include:

- HHSC Vehicle Fleet: Building 622 (18-wheel and box truck vehicles)
- ASH Motor Pool (primarily cars and vans)
- Food Preparation and Cookware Cleaning Facility: Building 798
- Food and Dry Goods Receiving / Distribution Center: Building 796 (includes administrative space)

- ASH Maintenance and Supply Facility: Buildings 627, 629 & 642
- Linen Distribution Center: Building 551
- Primary Campus Electrical Switchgear & Power Plant: Building 538
- Below-grade Utilities Under New Hospital Pad Site

The master plan adopts several different strategies to address the services and facilities identified above. Each of them are essential to operations for both ASH and other HHSC facilities, specifically the Austin State Supported Living Center (AuSSLC). Development of strategies to maintain operations for each of the items listed above will have cost impacts to this project that have been included, whether they are in cost estimates for the replacement hospital or identified as a separate component of work. As stated, some of the recommendations are not included in cost estimates of the new hospital as it has been assumed finances to pay for them will be funded outside of ASH replacement funds. The master planning team, along with representatives from HHSC and AuSSLC, considered each of the services and facilities listed above and concluded which of them would be best if extracted from the ASH campus and permanently relocated to AuSSLC in order to improve services to that facility and improve operational efficiencies.

Implementation Details

Summary of Strategies for each Facility and/or Service

HHSC Vehicle Fleet: Building 622

- Extract this service and relocate to another location on the ASH campus.
- Cost for this scope is included within the replacement hospital estimates.

ASH Motor Pool

- Relocate this service internally to existing ASH campus.
- May require temporary location until new hospital is complete.
- The space program of the new hospital does include sufficient provisions for this service on a permanent basis.
- Cost for this scope is included within the replacement hospital estimates.

Food Preparation and Cookware Cleaning Facility: Building 798

- Construct modular facility on ASH campus to provide services during new hospital construction.
- Requires utility connections.
- The space program of the new hospital does include sufficient provisions for this service on a permanent basis.
- Cost for this scope is included within the replacement hospital estimates.

Food and Dry Goods Receiving/Distribution Center: Building 796

- Utilize existing warehouse at AuSSLC to accommodate warehousing and distribution needs for AuSSLC and relocate to that campus.
- Renovate an existing building on ASH campus to accommodate needs specific to ASH during construction of new hospital.
- The space program of the new hospital does include sufficient provisions for this service on a permanent basis.
- Costs to construct and relocate facilities on the AuSSLC have not been provided.
- Costs for temporary facilities on the ASH campus have been included within the replacement hospital estimates.

Cost Summary

ASH Maintenance and Supply Facility: Buildings 627, 629 & 642

- To be relocated within the ASH campus.
- Costs are included in the cost estimate, and permanent facilities for the replacement hospital are included within the construction budget.

Linen Distribution Center: Building 551

- Renovate an unoccupied building on ASH campus to provide services during new hospital construction.
- The space program of the new hospital does include sufficient provisions for this service on a permanent basis.
- Cost for this scope is included within the replacement hospital estimates.

Primary Campus Electrical Switchgear and Power Plant: Building 538

- Currently the main function of the old power plant is to house electrical gear for the entire campus.
- Cost to replace this gear and a facility to house it is not included in the new hospital estimates but is provided “below the line”.

Below-grade Utilities Under New Hospital Pad Site

- Costs to relocate this infrastructure are included in estimates for the new hospital.

Cost Summary

Project Cost Summary

The following cost models represent project cost estimates in a variety of ways in order to provide reviewers an understanding of probable costs and sufficient information to compare these costs to other similar type projects as well as cost information for optional scope items to be considered for this project.

Cost Comparison Models provided in this document include:

ASH Total Project Cost

This table represents the ASH Total Project Cost. The combination of building and site costs, along with escalation and build-out costs provide the estimated total project cost to design and construct the facility and site.

	AREA	UNIT	COST
1	240 Bed Hospital Building - 373,900 BGSF		\$ 173,923,000
2	Hospital Site Development - 15 AC		\$12,173,000
3	Existing Motor Pool Relocation		\$750,000
4	Modular/Interim Kitchen & Dishwashing Facility		\$4,202,000
5	Interim Maintenance, Warehouse & Linen Facility		\$3,000,000
6	Rerouting of Electrical & Infrastructure		\$1,000,000
7	Abatement & Demolition to Prepare Building Site		\$1,922,000
8	Limited Campus Driveways		\$3,030,000
9	Construction Subtotal	\$535/ SF	\$200,000,000
10	Escalation - 3 yrs @ 4% per year to Nov. 2021		\$24,000,000
11	Construction Total w/ Escalation		\$224,000,000
12	Build Out Costs	32%	\$71,680,000
13	Phase I Planning Funding*		(\$13,000,000)
14	Total Project Cost with Escalation		\$282,680,000

*The \$13M planning phase funding that has already been appropriated to the ASH Redesign is deducted from the estimated project costs.

Cost Summary

ASH Replacement & Recommended Options

	AREA	UNIT	COST
1	240 Bed Hospital Building - 373,900 BGSF		\$173,923,000
2	Hospital Site Development - 15 AC		\$12,173,000
3	Existing Motor Pool Relocation		\$750,000
4	Modular/Interim Kitchen & Dishwashing Facility		\$4,202,000
5	Interim Maintenance, Warehouse & Linen Facility		\$3,000,000
6	Rerouting of Electrical Infrastructure		\$1,000,000
7	Abatement & Demolition to Prepare Building Site		\$1,922,000
8	Limited Campus Driveways		\$3,030,000
9	Increase SF for "Chassis" of Future 48 Beds		\$6,600,000
10	Construction Subtotal	\$553/ SF	\$206,600,000
11	Escalation - 3 yrs @ 4% per year to Nov. 2021		\$24,792,000
12	Construction Total w/ Escalation		\$231,392,000
13	Build Out Costs	32%	\$74,045,000
14	Phase I Planning Funding*		(\$13,000,000)
15	Total Project Cost w/ Escalation		\$292,437,000

This table represents costs for a 240-bed facility and 15 acres of site development along with recommended optional costs. The site includes the relocations and associated demolition costs specific to the ASH campus site. This model has been increased in square footage in order to accommodate ancillary services and support functions that would be required if an additional 48 beds were included. This increase is not for the actual inpatient bed units but rather an increase in space necessary to support those beds. The concept is that the additional beds could be more easily constructed in the future without negatively impacting operations at that time.

*The \$13M planning phase funding that has already been appropriated to the ASH Redesign is deducted from the estimated project costs.

Cost Summary

Cost for 48 Additional Inpatient Beds

	AREA	UNIT	COST
1	48 Inpatient Beds - 51,250 BGSF		\$23,523,750
2	Site Development		\$2,352,000
3	Construction Subtotal	\$505/SF	\$25,875,750
4	Escalation - 3 yrs @ 4% per year to Nov. 2021		\$3,105,000
5	Construction Total w/ Escalation		\$28,891,000
6	Build Out Costs	32%	\$9,245,000
7	Total Project Cost w/ Escalation	\$744/SF	\$38,136,000

The table includes costs to provide an additional 48 inpatient beds as part of the initial project. These beds and associated costs could be added to the preceding estimates if it is determined that the initial hospital should support additional beds for people receiving care. Note that this model has been escalated the same as the other cost models. If these beds are built at a later date and not as part of original construction, the optional 48 beds will, in all likelihood, cost more due to inflation.

Optional Considerations

	AREA	COST
1	Abatement & Demolition of Existing Hospital Buildings	\$8,040,000
2	Campus Center Plaza	\$3,625,000
3	Extension of North/South Drive	\$3,230,000
4	Replacement of Electrical Gear & Building Enclosure (Replacement for Building 538)	\$11,070,000

The table represents line item costs for optional scope to be considered as part of this project. These options provide betterments for the ASH site that are not required to construct the hospital but improve site conditions for people receiving care, family, and staff, and create ease of developing the continuum of care on the site. These line items are shown as total project costs.

Schedule

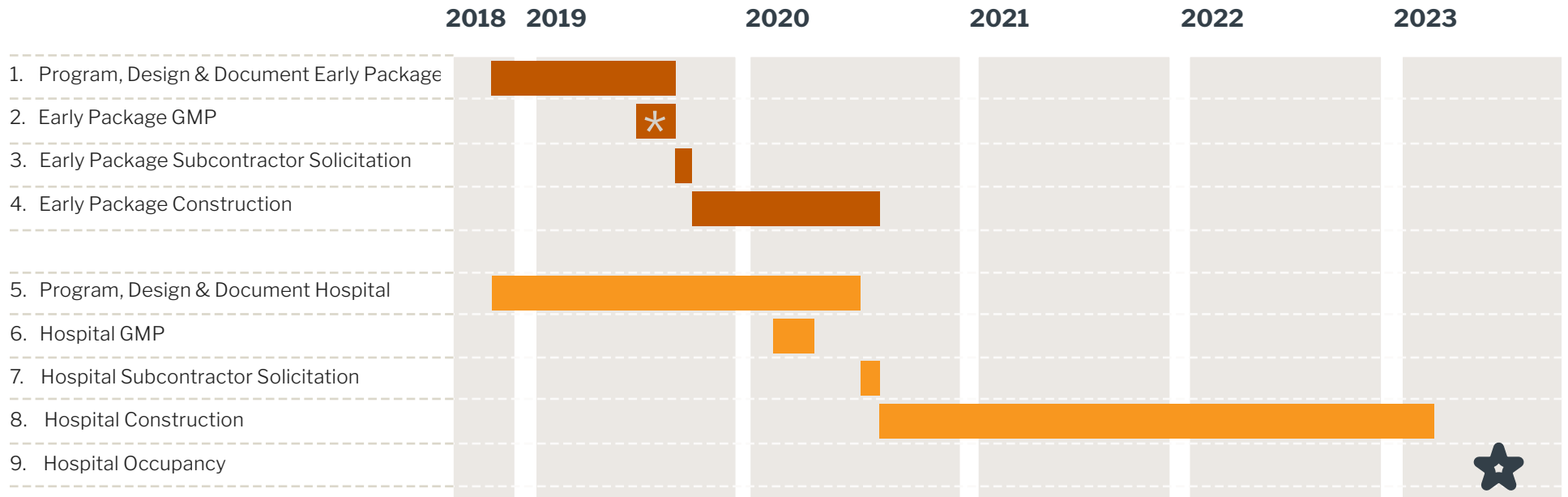
The current project schedule outlines an approximate 19-month period to program, design, and develop contract documents for the replacement hospital. An additional 31 months are allocated to solicit bids and construct the facility in order to reach substantial completion by January 2023. Another five months are provided to transition to full occupancy on or around June 2023.

To achieve the above milestones, Early Release Packages (ERPs) will be required to be produced by the implementation team in order to have the hospital pad site cleared for construction before July 2020.

Anticipated Early Release Packages (ERPs) include work to:

- Provide interim and temporary facilities for:
 - Kitchen and ware-washing
 - Dry food and supplies warehousing
 - Linens
 - Maintenance
 - ASH Motor Pool
- Reroute utilities that are below the new hospital pad site that is required to remain in service in order to keep existing facilities operational
- Infrastructure, building abatement, and demolition

Schedule



*Legislative Funding Could Cause Scope Reduction and Impact Schedule

**June
2023**

5

Campus Plan

- **Campus Framework**
- **Illustrative Plan**
- **Land Use**
- **Circulation**
- **Open Space**
- **Sustainability and Resilience**
- **Site Phasing**



New Hospital

The flexible campus organization reflects opportunities for long-term brain health treatment and research.

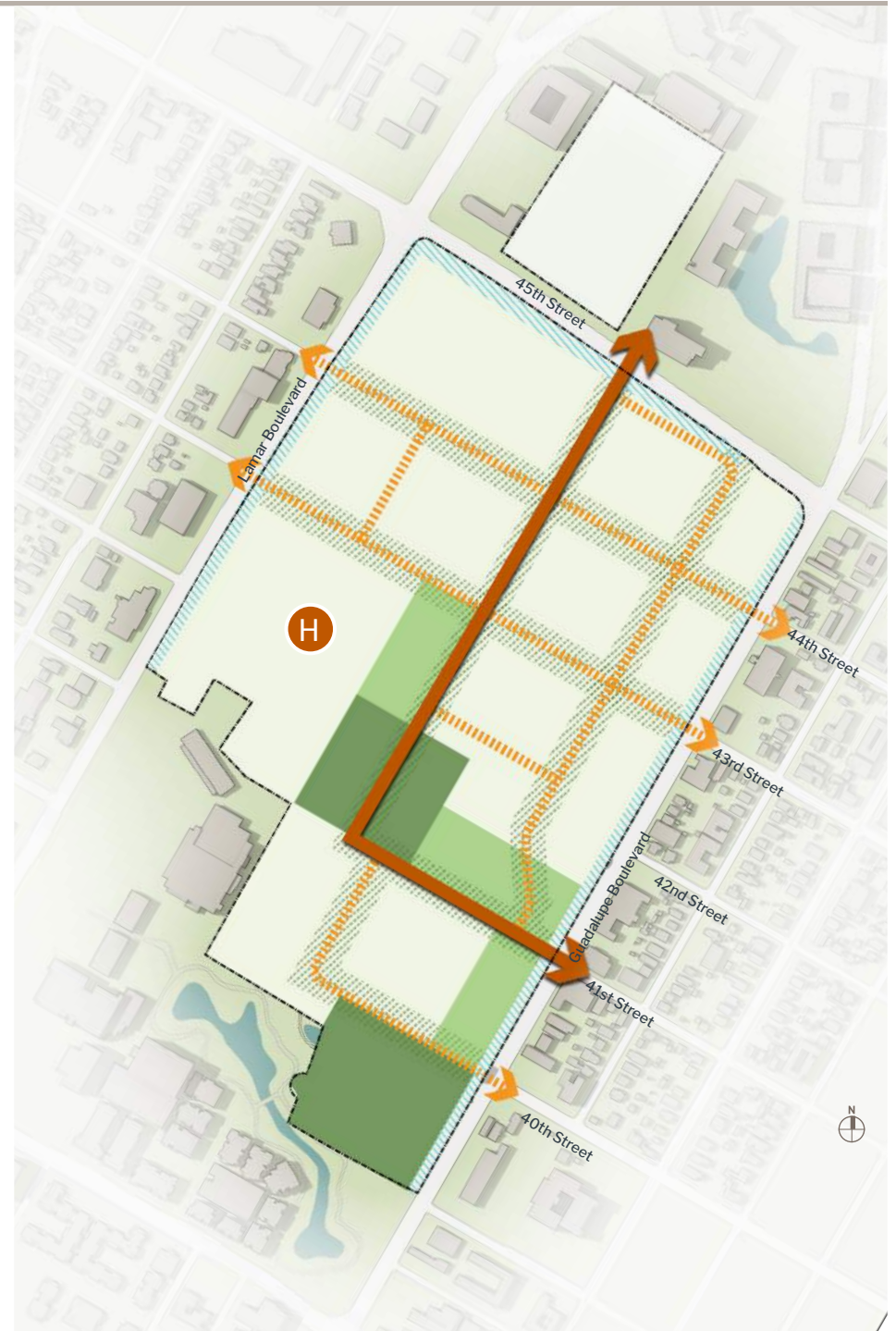
The overall campus growth pattern reflects an opportunity for brain health treatment in Central Texas to migrate from a cloistered existence within an otherwise urban setting to an outward focused campus with services available to those persons in need.

Campus Framework

The framework describes high level opportunities to provide restorative and aesthetic experiences, as well as social interactions beyond the hospital footprint, in order to create a campus that represents a model network for the continuum of brain health care.

It also encourages future projects to address sustainability and efficiencies in their design and development choices through smart development. The intent of the following framework principles is to build stronger communities and create a renewed sense of place through brain health stewardship:

- Reinforce the campus presence on Lamar Boulevard, Guadalupe Street, and 45th Street (light blue lines) as a means of turning the campus outward toward the surrounding neighborhoods.
- Reconnect the campus to the city grid and community by creating great urban, walkable corridors (dashed-orange lines).
- Create signature campus oriented open spaces and establish a central Campus Square at terminus of 41st Street (dark green) as a focal point for the hospital, campus, and surrounding community.
- Preserve existing natural campus assets (light green).
- Create an accessible urban campus spine for connectivity into the site (dark orange lines).



Illustrative Plan

The illustrative plan helps visualize the future of the ASH Brain Health Campus by providing a series of integrated solutions to meet the four identified goals to the fullest extent.

Much of the future use areas will be determined by brain healthcare growth patterns in the region and surrounding catchment area. There is built-in flexibility to accommodate a vast array of healthcare partners to enhance and enrich the overall campus. Potential partner functions that may occur in the near-term have been identified as “gray box development”, a term used to indicate that the uses fulfill the continuum of brain health care, but that the exact partners or locations may evolve as the campus develops.

The plan outlines future healthcare development opportunities beyond the indicated gray box development. These may be additional partner functions or other HHSC office and healthcare-related support functions.

1. ASH Hospital
2. Residential Care Facility
3. Acute/Short Stay Inpatient Psychiatric Hospital
4. Ambulatory Care Center and Departmental Offices
5. Urgent Care/Crisis Program
6. Therapeutic Housing Facility
7. Community Health Center
8. Campus Square
9. Healing Garden
10. Preserved Pecan Grove
11. Community Park
12. Short/Mid-Term CAPS Remains

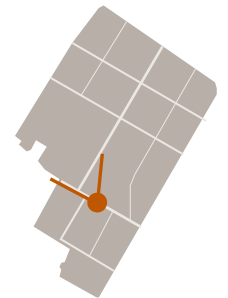




Campus Square

A traditional square is defined by its relationship to its edges and program.

Today the core of campus lacks structure, identity, and reasons to use the space. A new signature open space can bring new life to the campus, while creating a new and restorative healing environment between the sub-spaces.

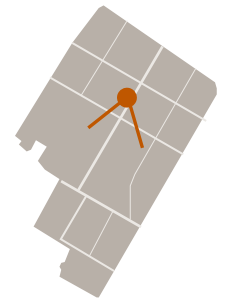




Central Spine

The central spine provides an organizing element and unifying link for the whole campus.

The new campus spine creates a central corridor for pedestrian, bicycle, and vehicular circulation through the site. It provides an opportunity for connectivity and ease of partnerships between the new hospital and associated gray box development.



Land Use Functional Zoning

Zoning areas provide distinct characteristics that help organize the functions of the campus.

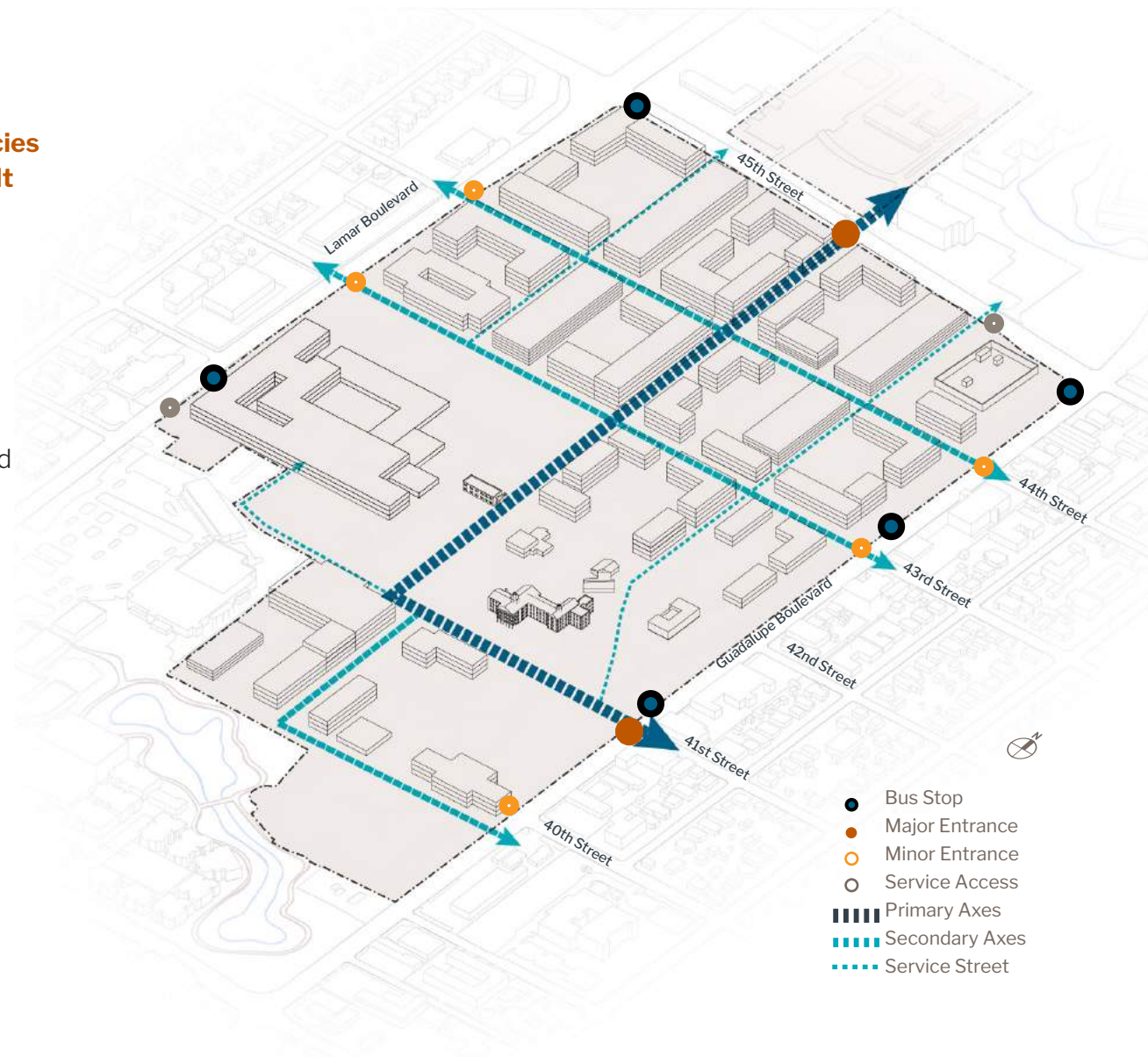
The hospital is located along Lamar Boulevard south of 43rd Street. Areas of preserved natural assets include the pecan grove, historic east entrance, and areas near Building 501. Dedicated open spaces serve multiple functions to enhance the hospital and promote community connections in the campus square and community park areas. Gray box development areas for brain health partnerships are concentrated north of 43rd and south of 41st Streets. Future use zones are primarily located north of 43rd Street with a smaller area identified for supportive therapeutic housing uses between 42nd and 43rd Streets, with a smaller scale in relation to historic Building 501, the chapel, and canteen buildings. The Austin Energy substation in the northeast corner of the site remains in place.



Circulation Multi-Modal

The central spine provides an organizational structure to the campus and eliminates redundancies in the existing roadway network that has been built up over time.

Internal access streets aligned with 43rd and 44th Streets in the adjacent neighborhood provide additional access into the site for pedestrians, bicycles, and vehicular connections to internal brain health partnerships. An extension aligned with 40th Street provides a new access point to the designated community park area.



Circulation

Multi-Modal

Primary Axes

The existing east entrance to the hospital will be improved to reinforce the primary entrance to the campus and new hospital building. This location will link to the new north-south central spine that provides connectivity through the remainder of the site for pedestrians, bicycles, and vehicles and links to a second major entrance along 45th Street.

Secondary Axes

The internal access streets are outlined to provide connectivity into the site from adjacent neighborhoods and links to multiple bus stations along the perimeter of the campus. These are outlined in the plan as multi-modal streets with ample space provided for bicycle and pedestrian access along with vehicular access. They will also provide emergency access points for gray box development and future uses within the site.

Service Access

The new hospital facility will have service access near the intersection of Lamar Boulevard and 43rd Street. A secondary service drive to the hospital is provided at the south side of this parcel. Future use parcels on the northwest quadrant of the campus will include an interior service drive for ease of access to buildings.

Circulation

Traffic Calming Strategies

As new roadways are constructed through the campus, it is important to prioritize ease of pedestrian flow, as well as bicycle access through the site.

Traffic calming strategies should be implemented along these corridors to reduce vehicular travel speeds and to discourage cut-through traffic. These corridors should have no fewer than three intersections in the east-west directions with required vehicular stops.



Strategy 1 Curb Extensions

Reduce the width of the street from the outside where there is excess pavement. They can also shorten pedestrian crossing distances.

Strategy 2 Marked Intersections/Crossings

At primary pedestrian crossings of streets, pedestrians should be given priority over vehicles and bicycles. One mechanism that should be explored, particularly at the campus spine, is the implementation of raised intersections, otherwise known as speed tables. In this instance, the entire intersection is raised to the curb height so that the pedestrian can maintain a consistent walking condition and vehicles are slowed by a stop sign and requirement to drive up and over the speed table.

Strategy 3 Digital Speed Signs

Providing digital speed signs warns drivers of their speed in relation to the posted speed limit. Though less effective than physical measures, they have been shown to be effective in reducing speed.

Circulation

Traffic Calming Strategies

Strategy 4 Medians with Reduced Land Widths

Are islands located between travel lanes that reduce travel lane widths and allows for planting and pedestrian refuge at crosswalks. Travel lanes within the campus should be kept to a minimum dimension, which makes it uncomfortable for drivers to move at excessive speeds. A maximum travel lane of 11' is recommended, and roads should consist of only one lane in each direction.

Strategy 5 Enhanced Street Character

Street character can be defined with textured or colored paving as a way to delineate roadway edges. This is a very effective method of changing the initial impression of the street. If done right, drivers tend to slow down when streetscapes are enhanced beyond typical design standards.

Strategy 6 Reduce Speed Limit (Not shown)

Another traffic calming strategy is to post a reduced speed limit at 20mph.

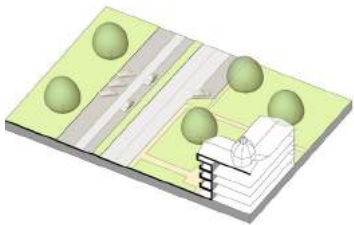


Circulation

Street Improvements

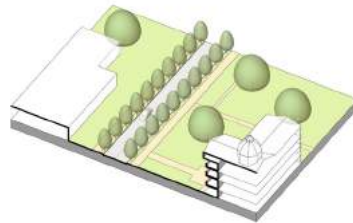


East Entrance
Existing



1. Numerous surface parking lots
2. Lack of sidewalks/ pedestrian access

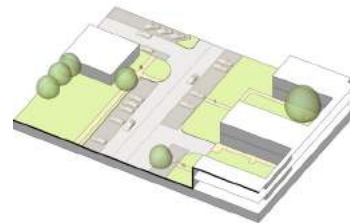
Future



1. Reduced lane widths, improved green infrastructure
2. Improved pedestrian access

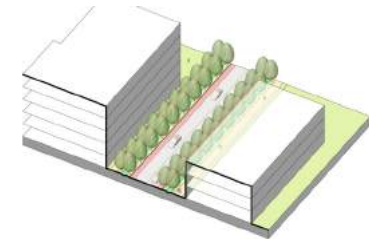


Central Spine
Existing



1. Numerous surface parking lots
2. Lack of sidewalks/ pedestrian access
3. Back of house/loading area

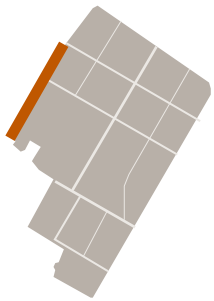
Future



1. Improved green infrastructure
2. Improved pedestrian access
3. Bike lanes

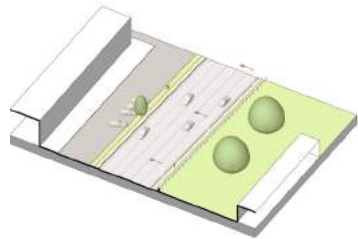
Circulation

Street Improvements

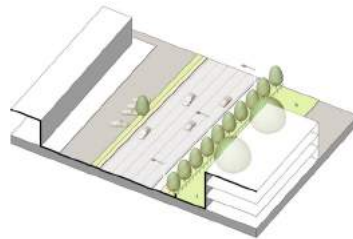


Lamar Edge

Existing



Future



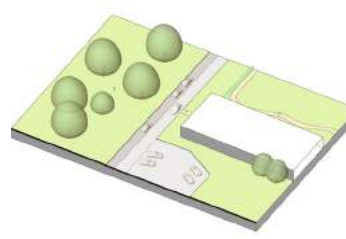
1. Surface parking lot
2. Lack of sidewalks/ pedestrian access
3. Mature trees
4. Backside of service buildings
5. Fence barrier

1. Improved pedestrian access
2. Green buffer landscape/ maintained mature trees
3. Hospital frontage to create street edge
4. Setback security fence

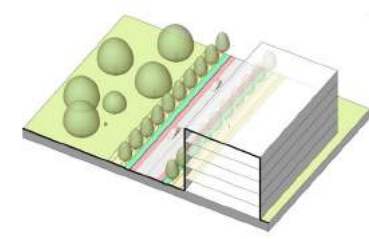


Internal Access

Existing



Future



1. Roadway
2. Surface parking lot
3. Lack of sidewalks/ pedestrian access

1. Improved pedestrian access
2. Reduced lane widths/green infrastructure/bike lanes

Open Space Typologies

The open space network for the campus has been developed to leverage existing assets and expand the utilization of these features throughout the campus. These features act as a means of enhancing the campus environment for patients and employees while also tying back into the surrounding community as a means of reducing the psychological separation between the hospital and its surroundings.

Rich landscapes and trees around the historic campus entrance and Building 501 provide a unique entrance experience that can be extended into a Campus Square that will act as the center of activity for the entire campus. The existing Pecan Grove will also act as an organizing feature and respite at the heart of the site. A community park that expands the adjacent Central Park affords a direct opportunity for the surrounding community to access and engage with the campus environment. These open spaces are all linked by green infrastructure opportunities that will provide a network of pedestrian connections throughout the site as well as creating a system for sustainable stormwater conveyance through the site.



Open Space

Existing Campus Assets



Preserve Pecan Groves & Mature Trees Where Possible

There are several clusters of mature trees on campus that should be maintained and/or enhanced to add shade and campus character. The pecan grove north of the proposed campus square is a notable grouping of trees that adds an important restorative aspect to the future ASH hospital.



Celebrate Building 501

Building 501 is an important asset for the campus and plays a pivotal role in the East Entryway experience.

Open Space Campus Square Strategies



Add Tree Canopy & Shade

Shade is an important element to creating comfortable spaces on campus. Tree canopies reduce urban heat island effects, noise, and provide a scenic setting for everyone.

Image: Page / Trinity University



Use Local Materials

Materials play a critical part of the campus identity near the hospital facilities and the campus.

Image: Page / Entrance Plaza for VA Austin Outpatient Clinic

Open Space Campus Square Strategies



Enhance Pathways

A variety of paths serve functional, healing, and health purposes to encourage walking throughout campus.

Image: Page/ University of Houston - Cougar Woods Dining Hall



Create Common Spaces

Fostering strategic areas of human interaction are important to creating a broader sense of community.

Image: Baylor Scott & White Medical Center - Lakeway

Sustainability and Resilience Strategies and Opportunities

Strategies

The Master Plan Update proposes a number of significant strategies listed below that would result in a more sustainable and resilient campus.



Healthcare and Research

- Promote partnerships for sustainability through enhanced adjacencies.



Green Building

- Maximize energy efficiency through east/west building orientations.
- Optimize laboratory and other high-demand program efficiencies through adjacencies.
- Apply passive strategies for orientation and envelope to reduce peak load and equipment first costs.



Landscape

- Establish green street design to mitigate stormwater runoff.
- Diversify uses throughout the campus to encourage walking and increased quality of campus life.
- Continue to build additional tree cover for relief against the heat.
- Enhance existing water areas to create a campus amenity.



Transportation and Mobility

- Support Transit Oriented Development (TOD) patterns by concentrating future mixed-use development near the core of campus.
- Create pedestrian connections to enhance walkability.
- Locate new parking on campus to intercept traffic at the campus edge to reduce internal traffic.
- Develop new buildings and pathways from the extended city grid to reinforce pedestrian routes to and from the campus core.
- Reinforce inter-system connectivity with CapMetro and MetroRapid to make the transfer between systems seamless and convenient.

Sustainability and Resilience Strategies and Opportunities

Opportunities

The list below is intended to generate ideas that will result in new educational, research, and community-driven actions and coalition efforts.

- Create a comprehensive Campus Sustainability Master Plan.
- Develop green building targets, sustainable procurement, and new construction standards that reference AASHE Sustainability Tracking, Assessment & Rating System (STARS) report.
- Collect and compare similar energy performance data of existing projects.
- Promote collaborative, interdisciplinary research efforts to grow a sustainable culture on campus.

Site Phasing

1a. Relocation of Program

Phase 1 development of the campus is broadly defined as activities required to construct a new hospital facility for ASH. The phase is broken into multiple sub-phases to indicate specific sequencing necessary to accomplish this objective. Phase 1a requires the relocation of existing service functions on the west side of the campus. The facilities are listed below and details about the potential moves are indicated in the associated graphic.

Plant Maintenance Facility: Buildings 627/628/629

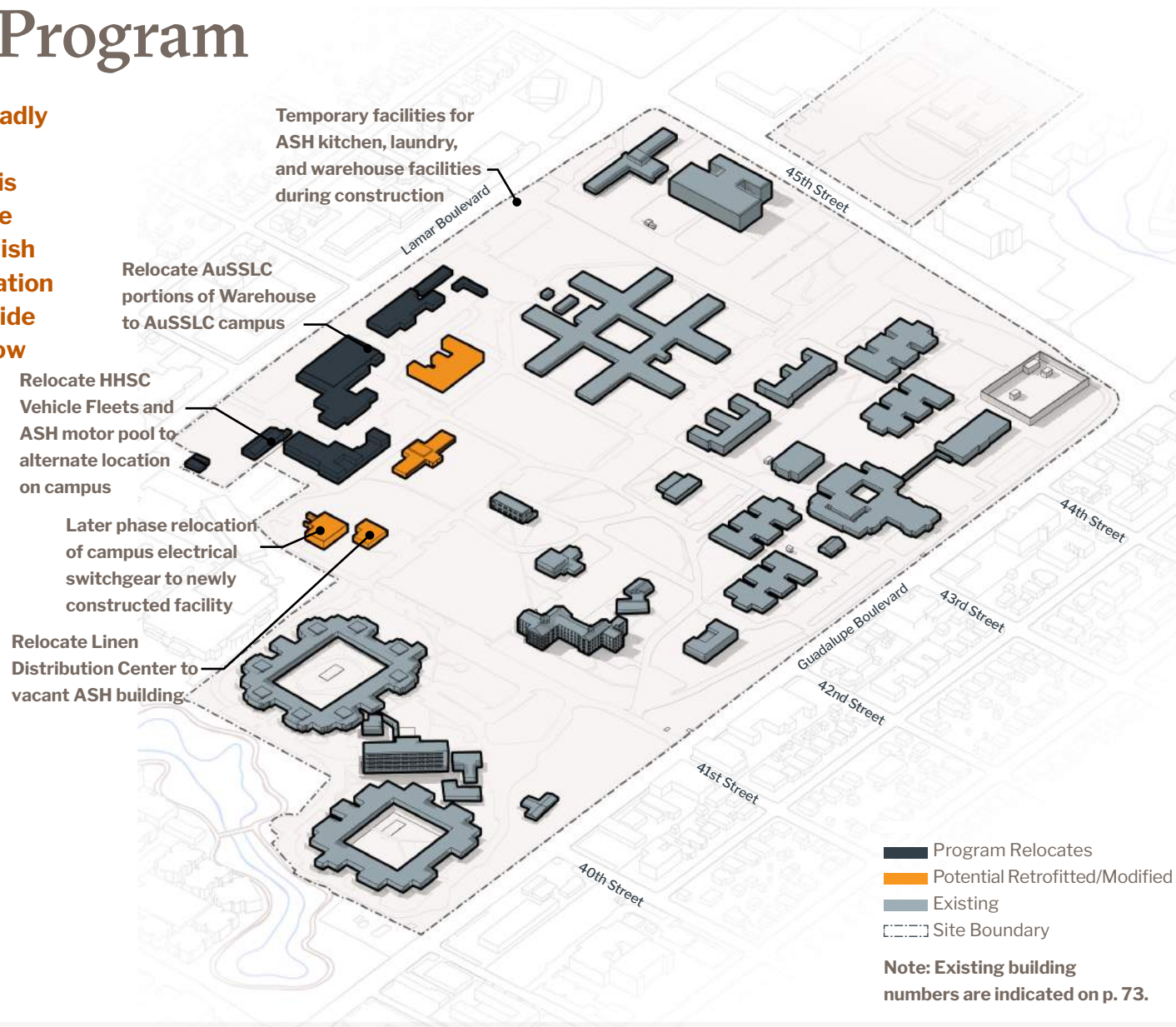
- 1.15 Site Acreage
- 15,000 Building SF

Facility Supply & Warehouse: Buildings 796/798

- 1.5 Site Acreage
- 30,000 Building SF

Motor Pool & HHSC Vehicle Fleet Area: Building 692

- 1.4 Site Acreage
- 2,500 (est.) Building SF
- Fuel Storage Tanks On-site



Site Phasing

1b. Demo-Infrastructure Improvements

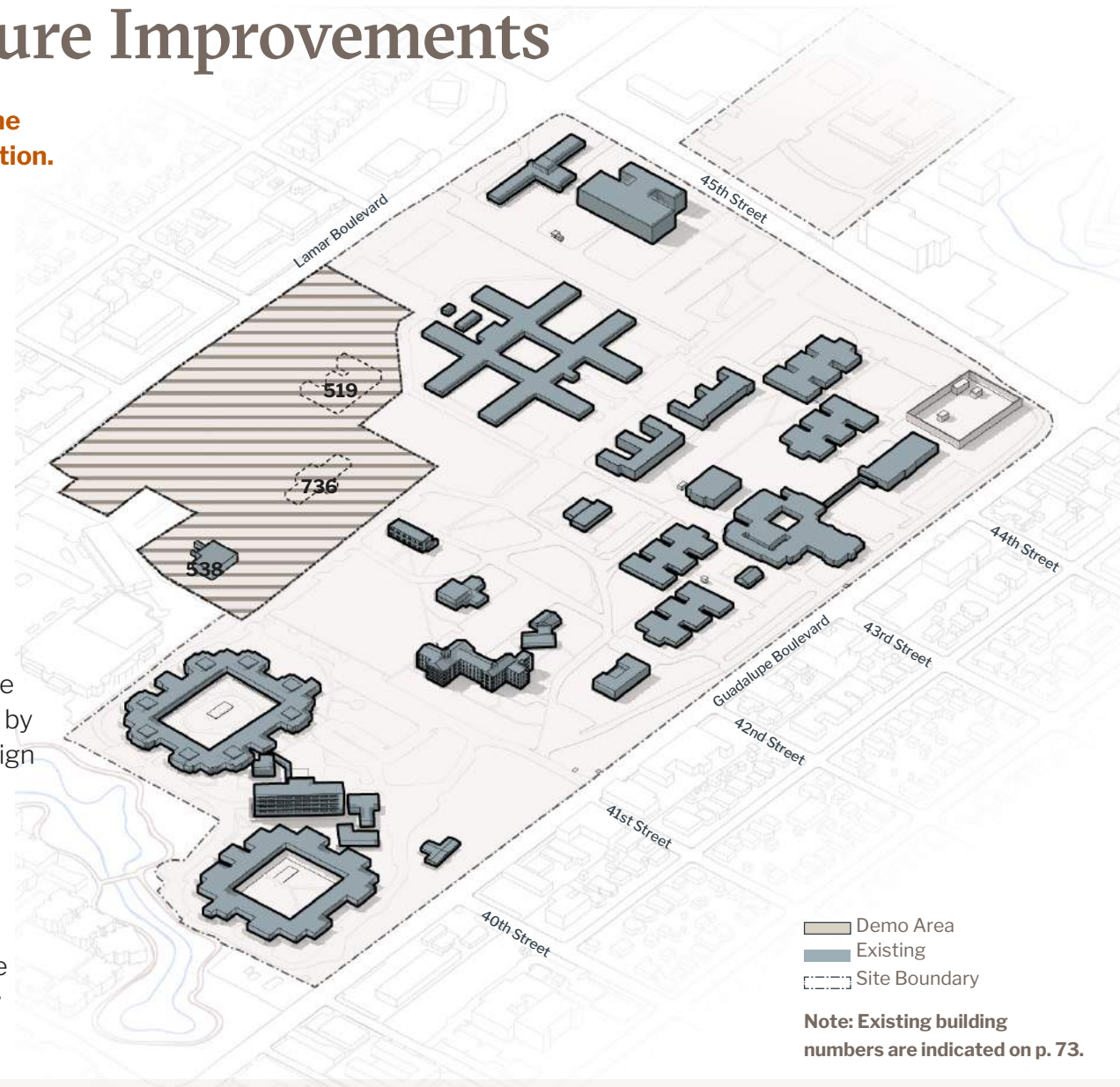
Phase 1b includes demolition of all buildings within the hospital site necessary to clear the area for construction.

- Future Hospital Site Area (+/-15AC)
- Building 524
- Building 551
- Building 627
- Building 628
- Building 629
- Building 640
- Building 692
- Building 796
- Building 798

Buildings indicated as having potential historical significance will be explored for adaptive reuse only if determined to have a viable program function within the future hospital organization. This decision will be made by the project team during detailed programming and design of the facility.

- Building 519
- Building 736

The Power Plant (Building 538) will be retained until the campus-wide electrical switchgear is replaced in a new facility.



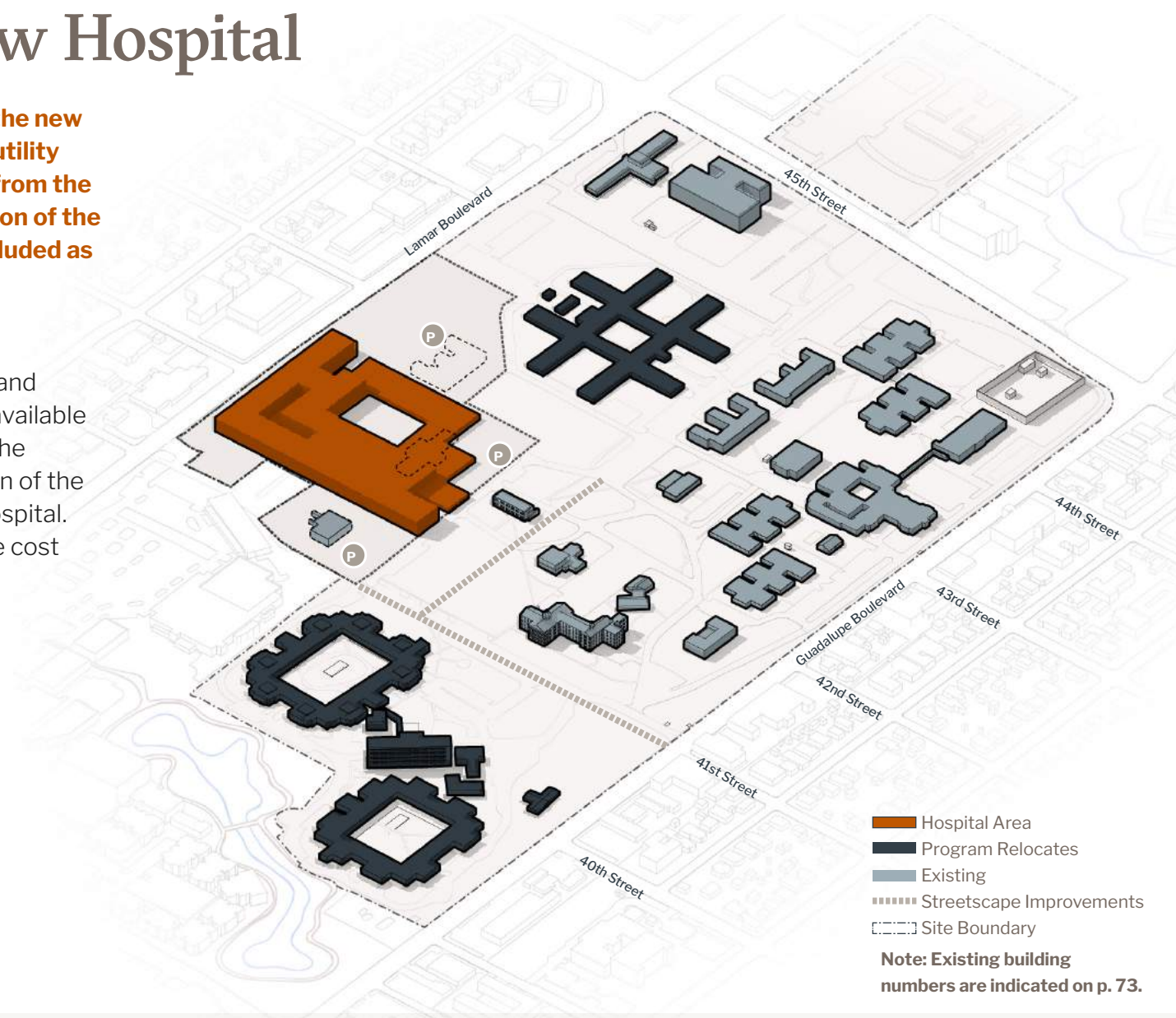
Site Phasing

1c. Construct New Hospital

Phase 1c will include the construction of the new hospital facility and all essential site and utility improvements. Improvements to access from the historic east entrance and limited extension of the central spine (Triangle Avenue) will be included as part of this phase.

Additional optional improvements are recommended to occur on campus during and after the hospital construction (subject to available funding). These include the completion of the central spine to 45th Street and the creation of the campus square near the entrance to the hospital. Estimate for these items are included in the cost estimates in section 4 of this report.

- Future Campus Square Area (+/-3AC)
- Primary Entrance Improvements
- Area A of Campus Square Completed
- Secondary Entrance Improvements

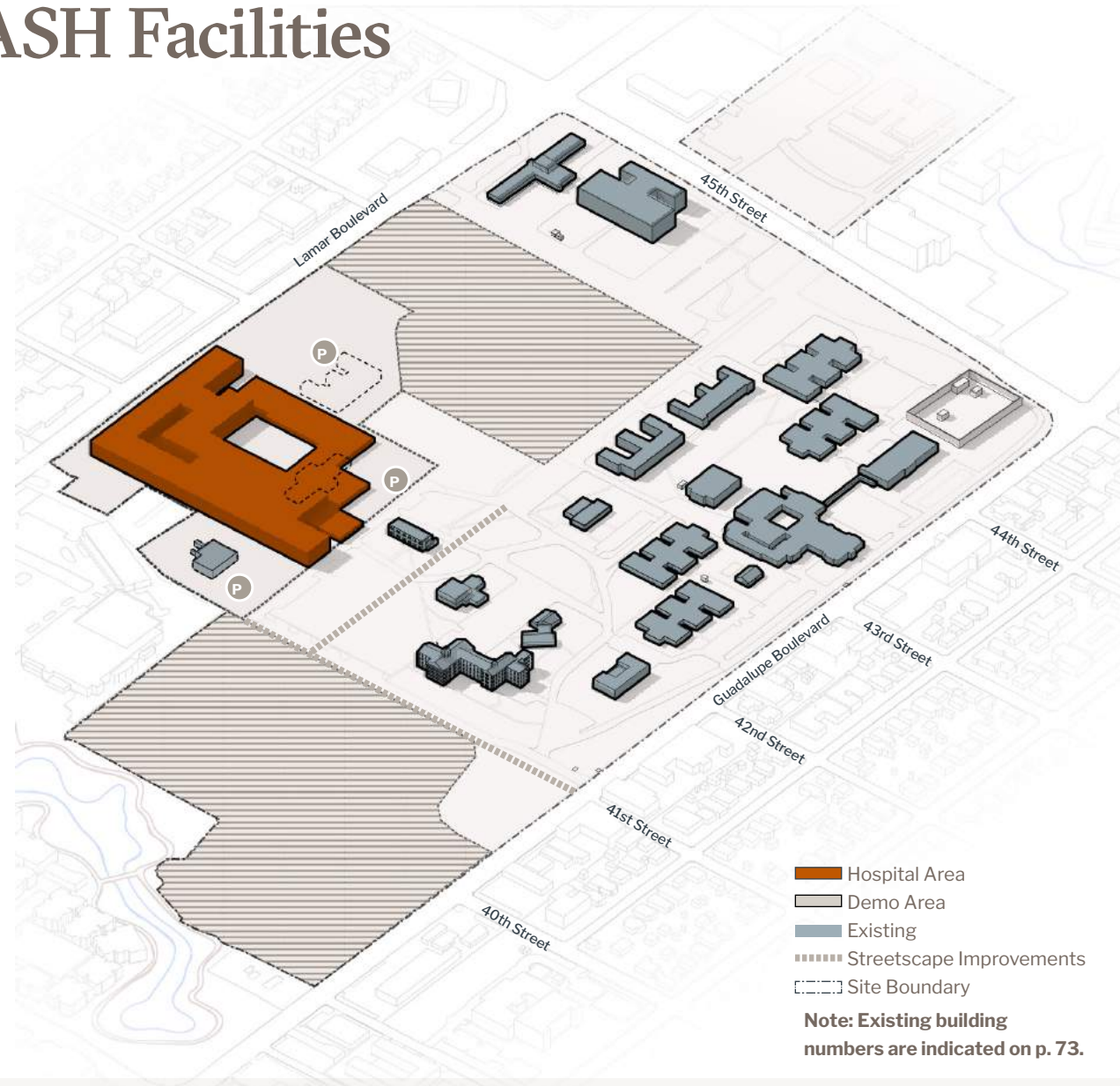


Site Phasing

2. Demolish Vacated ASH Facilities

Once the new hospital facility is completed and operational, Phase 2 will ready the sites of the existing facilities for future partnership development opportunities. This includes areas north of 43rd Street on the west half of the campus, as well as areas south of 41st Street.

- Gray Box Area North of 43rd Street (+/-13AC)
- Gray Box Area South of 41st Street (+/-16AC)



Site Phasing

3. Gray Box Development

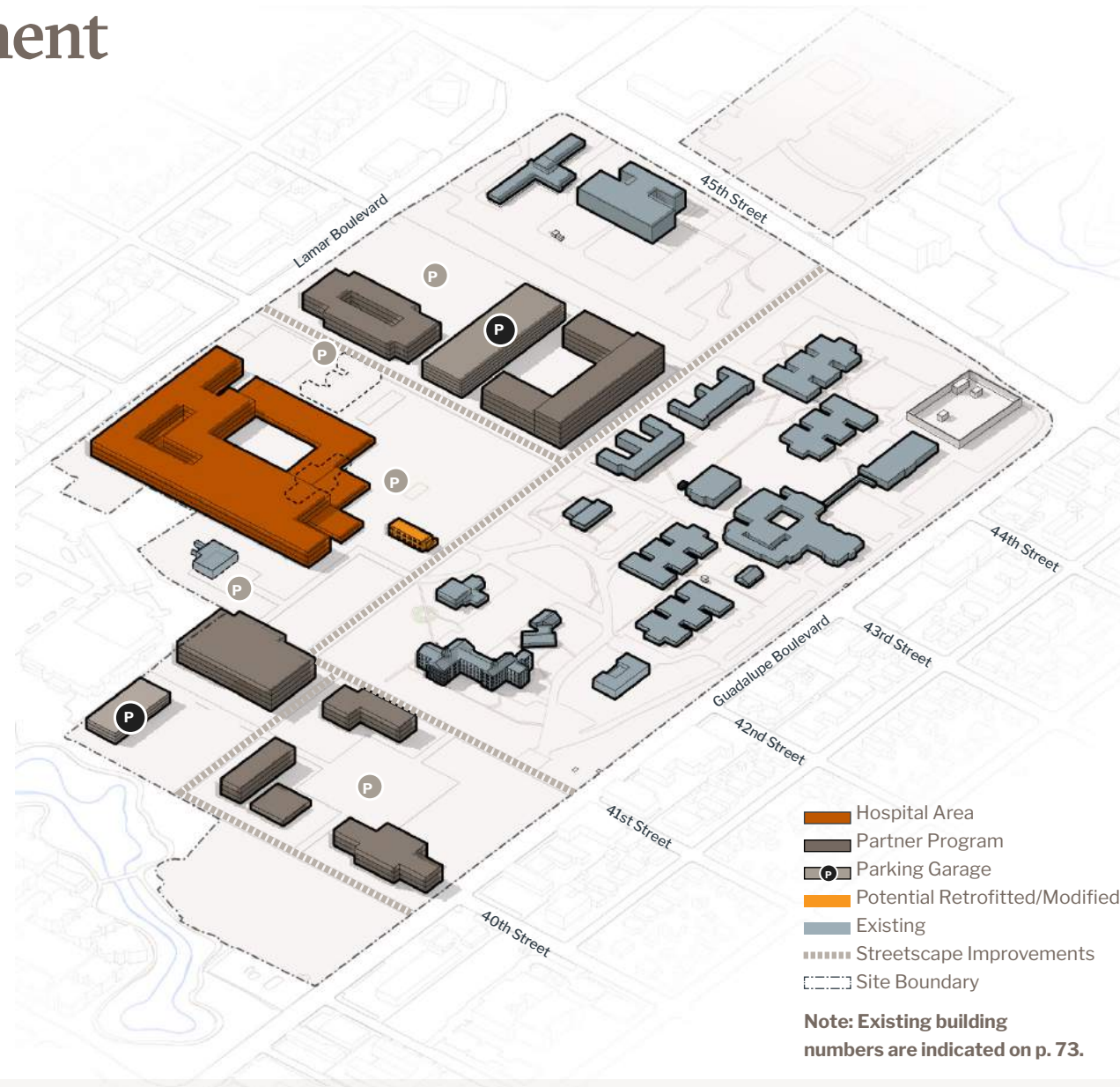
Phase 3 will utilize the area of existing hospital facilities to develop gray box opportunities for the continuum of brain health care. These facilities will be developed in partnership with other brain health organizations and will serve as a model of integrated care for the entirety of ASH catchment area. These facilities include the following:

North of 43rd Street

- Acute/Short Stay Inpatient Psychiatric Hospital
- Residential Care Facility

South of 41st Street

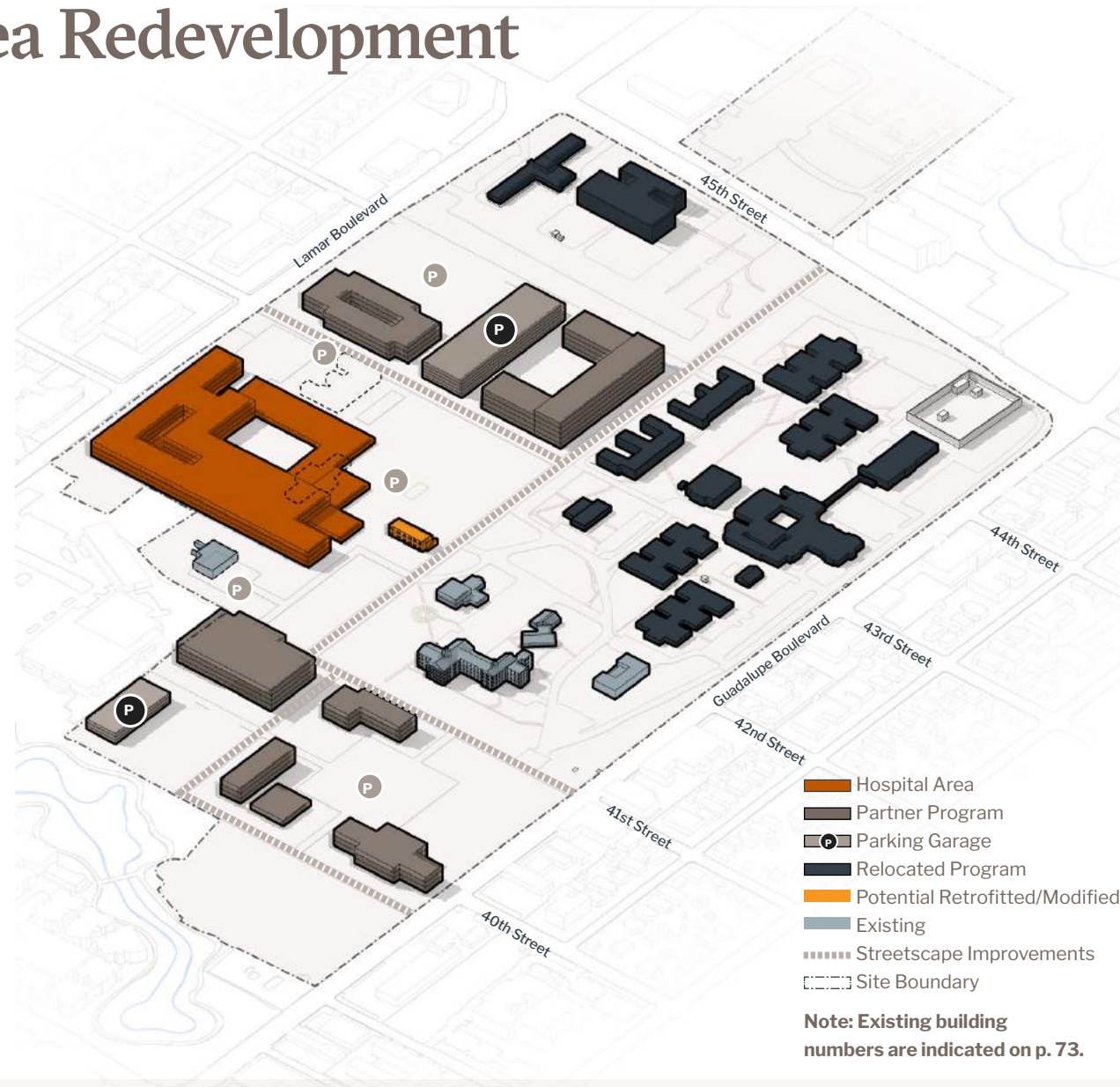
- Urgent Care/Crisis Program
- Community Health Center
- Therapeutic Housing Facility
- Ambulatory Care Center and Departmental Offices



Site Phasing

4a. Phased HHSC Area Redevelopment

Beyond the first three phases, other areas of the campus currently house a significant number of HHSC employees serving in functions not directly related to ASH. Costs to relocate these employees, either within the campus or to another nearby State site, will need to be considered prior to any redevelopment of these areas.

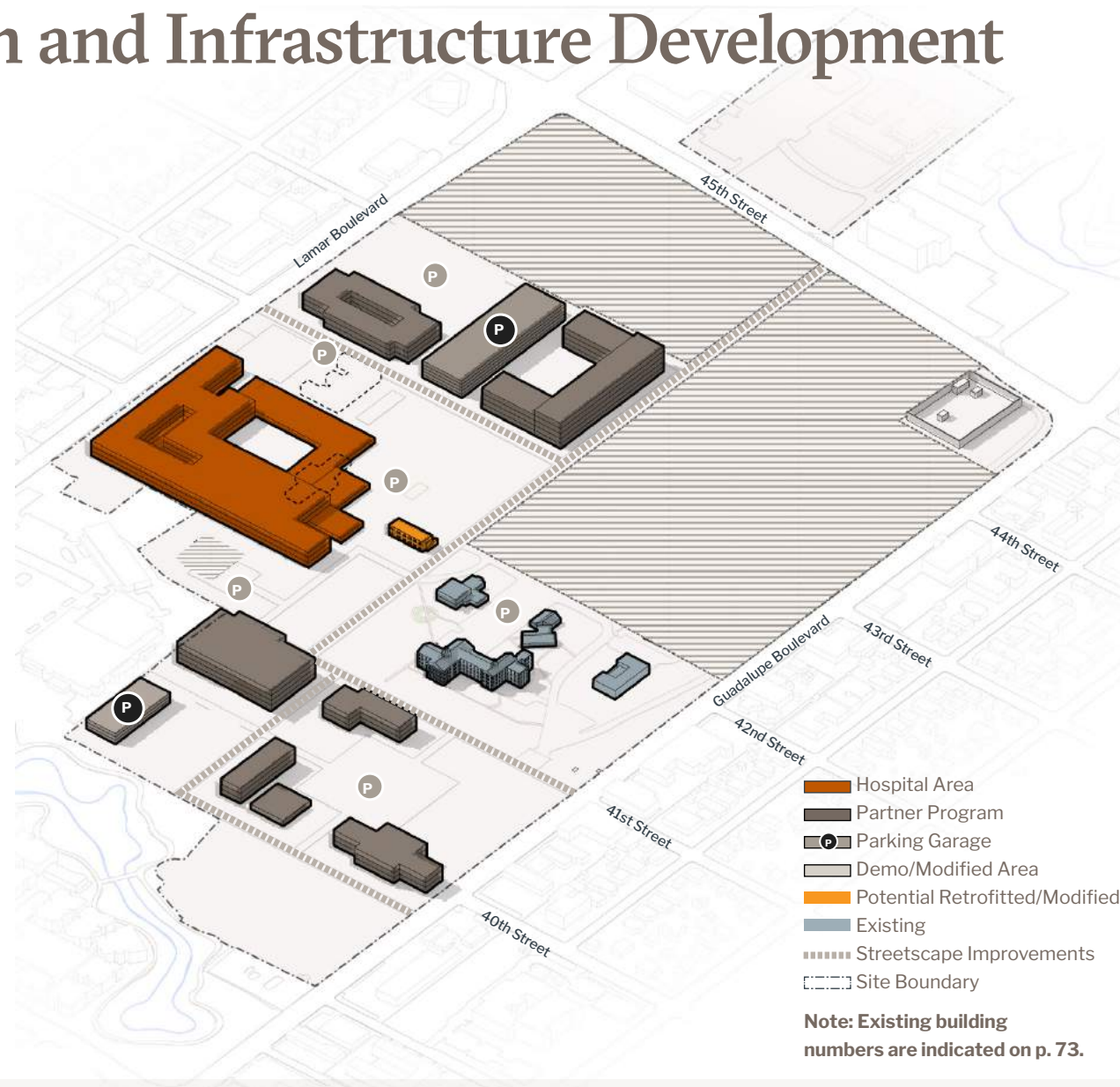


Site Phasing

4b. Phased Demolition and Infrastructure Development

Phase 4b will include demolition of previously-occupied HHSC buildings on the campus. Pending future development needs, these buildings may be removed at one time or, more likely, as subdivided development blocks as needed to make space for new improvements:

- Future Development
- New Entrance
- Streetscape Improvements
- Replacement of Campus-wide Electrical Switchgear, Building 538 (if not completed during an earlier phase)



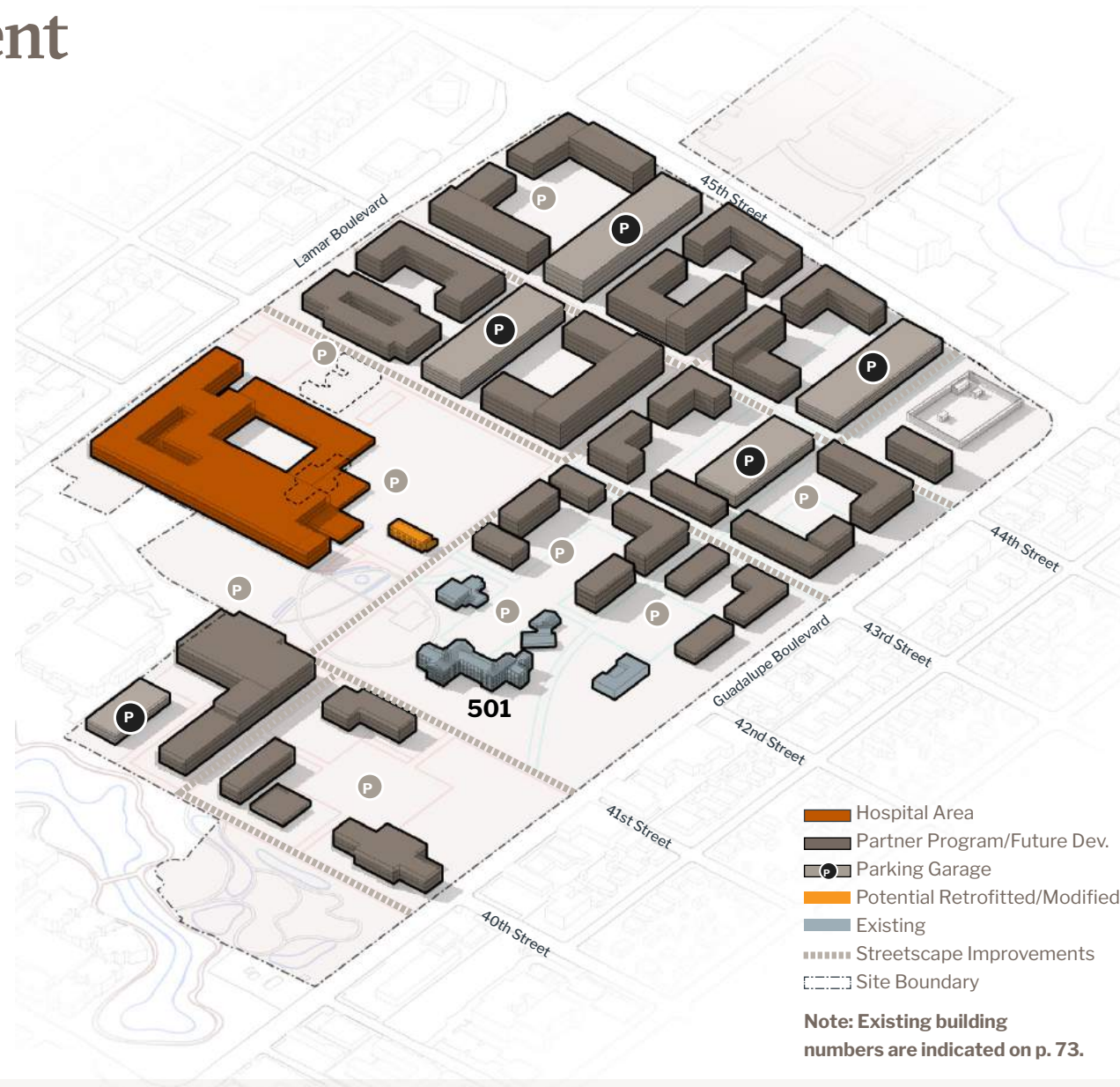
Site Phasing

4c. Future Development

Gray box development within Phase 4c is likely to be broken into multiple smaller phases as new partnership opportunities and needs are identified. These uses are yet to be determined, but will follow the model set in Phase 3 as an expansion of the continuum of care and a complete brain health campus.

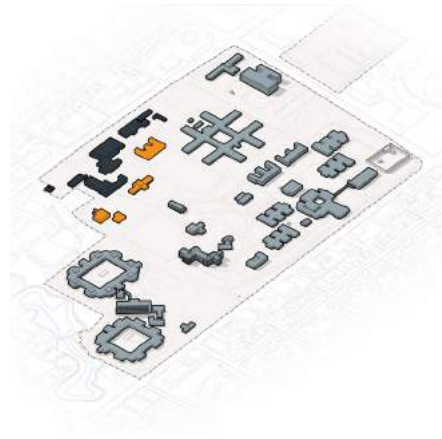
Developments closer to historic Building 501 should retain a smaller scale to relate to the massing of the smaller structures to the south. These may also function as therapeutic housing partnerships that can take advantage of the proximity to transit on Guadalupe Street as well as adjacency to open spaces around Building 501, the Chapel, and future Campus Square.

Partnership developments closer to 45th Street and Lamar Boulevard may take on a slightly larger massing to appropriately relate to nearby development outside of the campus.

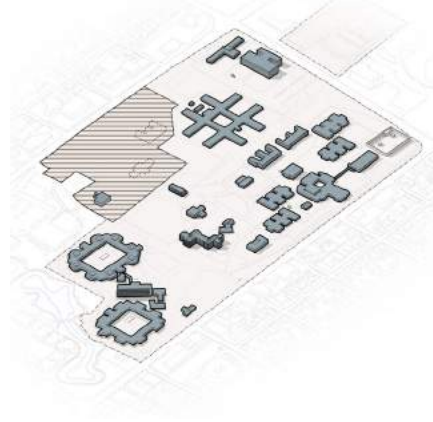


Site Phasing Summary

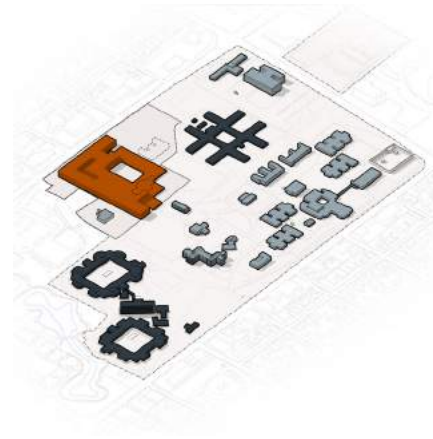
Phase 1A
Relocation of Program



Phase 1B
Demolish Buildings and Create Infrastructure Improvements



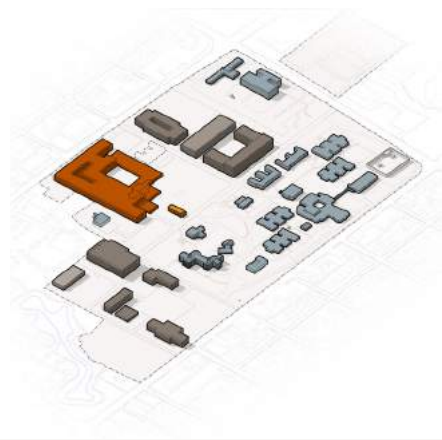
Phase 1C
Construct New Hospital



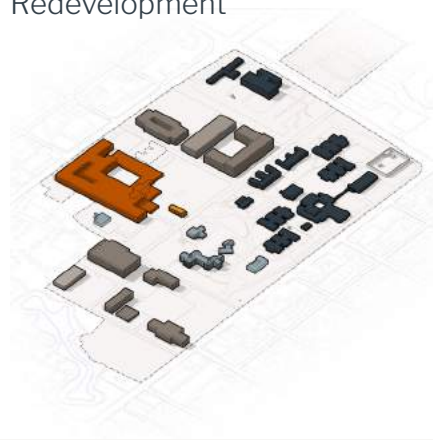
Phase 2
Demolish Vacated ASH Facilities



Phase 3
Gray Box Development



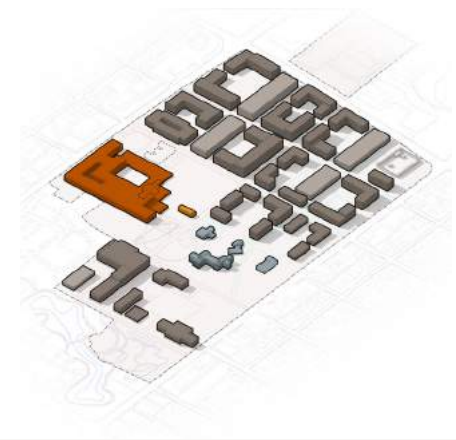
Phase 4A
Phased HHSC Area Redevelopment



Phase 4B
Phased Demolition and Infrastructure Improvements



Phase 4C
Future Development



6

Appendices

APPENDIX-A Site Analysis

APPENDIX-B Hospital Location Quadrant Analysis

APPENDIX-C Hospital Site Consumption

APPENDIX-D Space Model

APPENDIX-E Gray Box Precedents

APPENDIX-F Cost Estimate Details

APPENDIX-G Acknowledgments



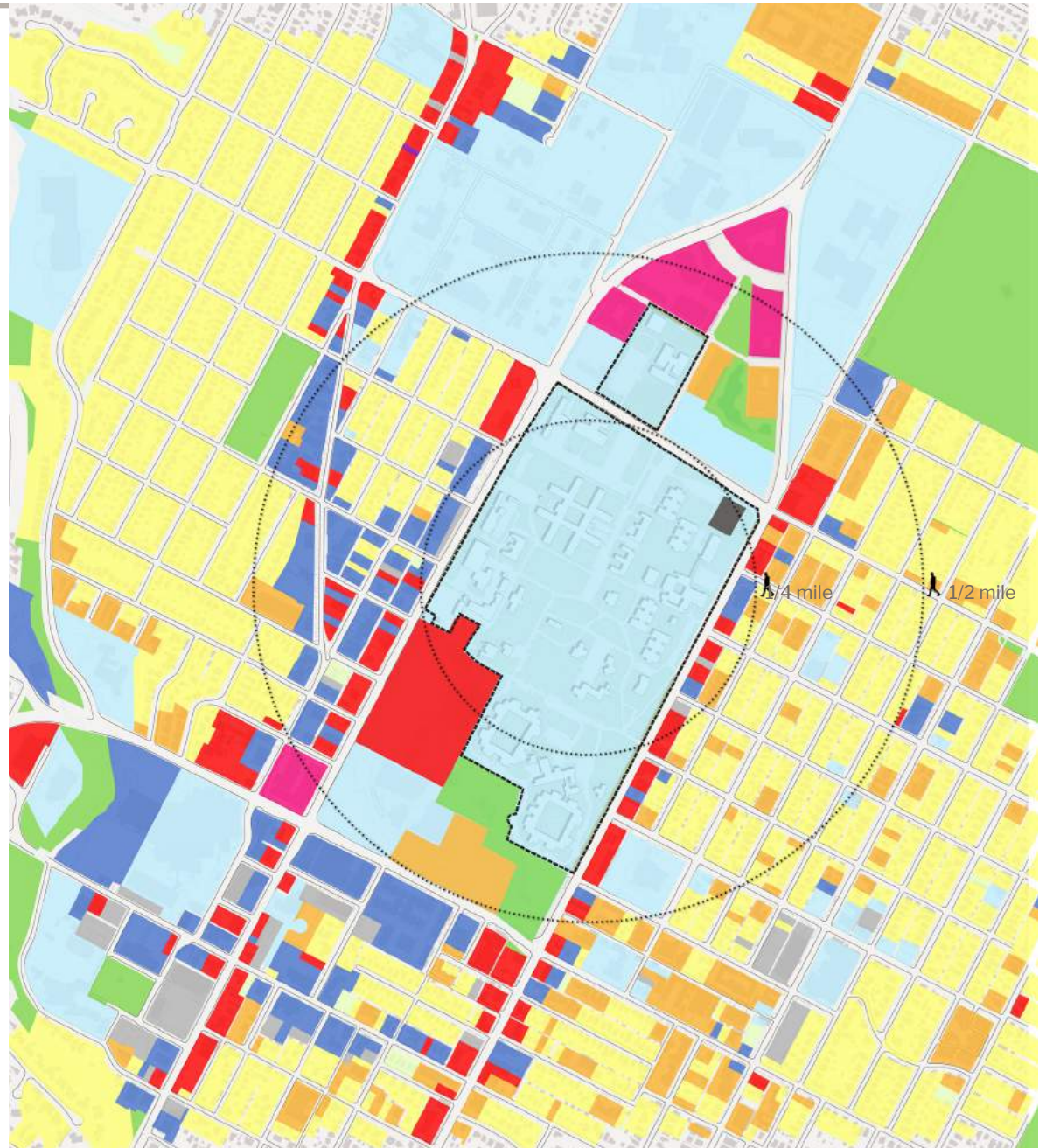
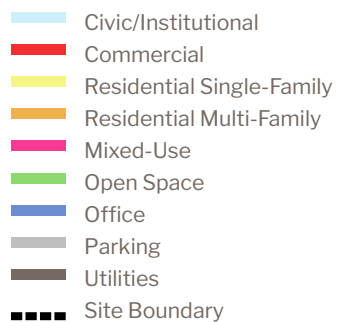


Site Analysis

Land Use

The ASH campus is bounded to the east and west with various retail and food service buildings.

- The ASH campus site co-locates the facility with other state-owned tracts that house administrative offices for several of the agencies overseen by Texas Health and Human Services.
- There is a lack of permeability to Central Market.



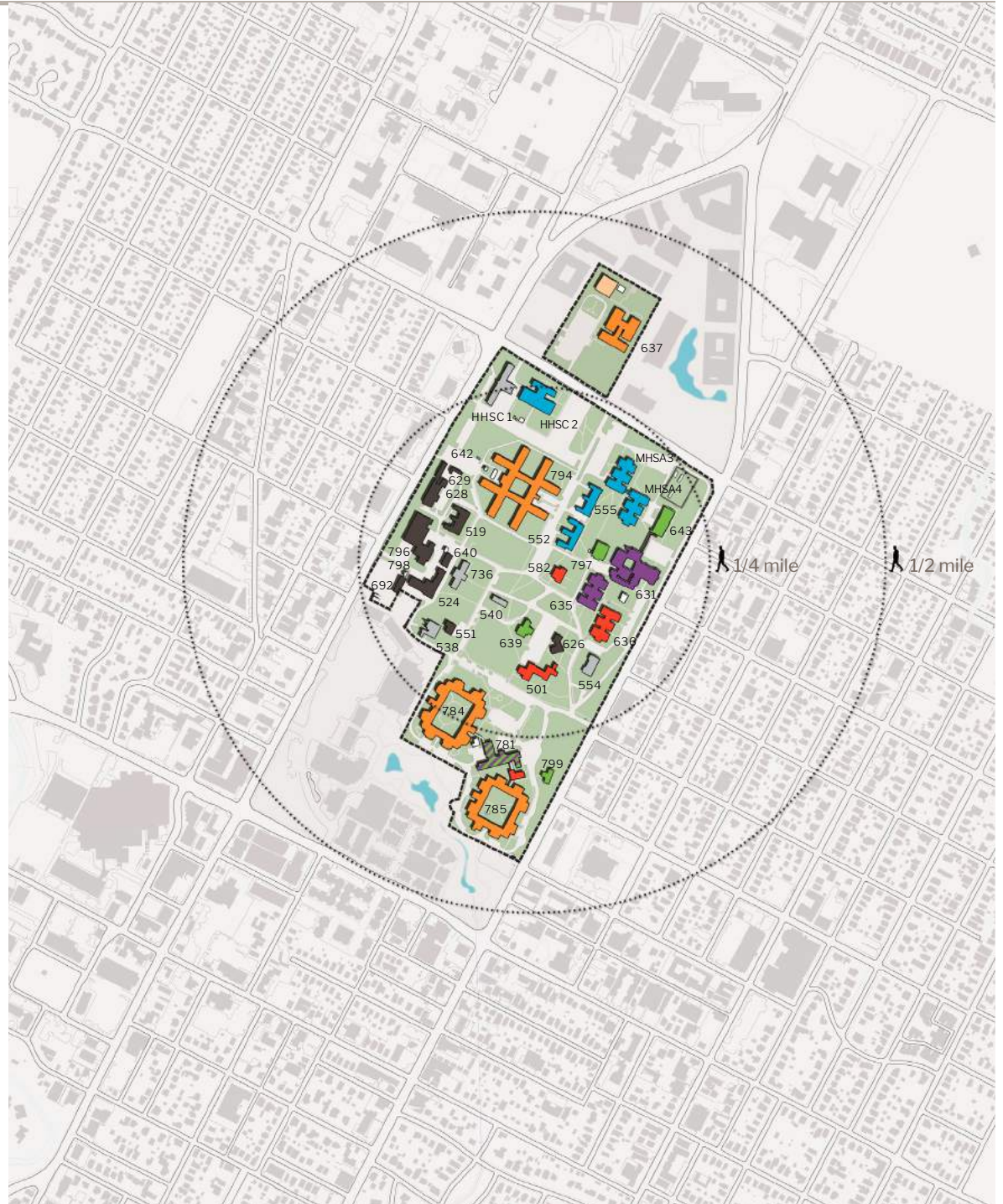
Notes GIS from City of Austin 2016

Buildings Uses

The information below describes the various building uses on the ASH campus.

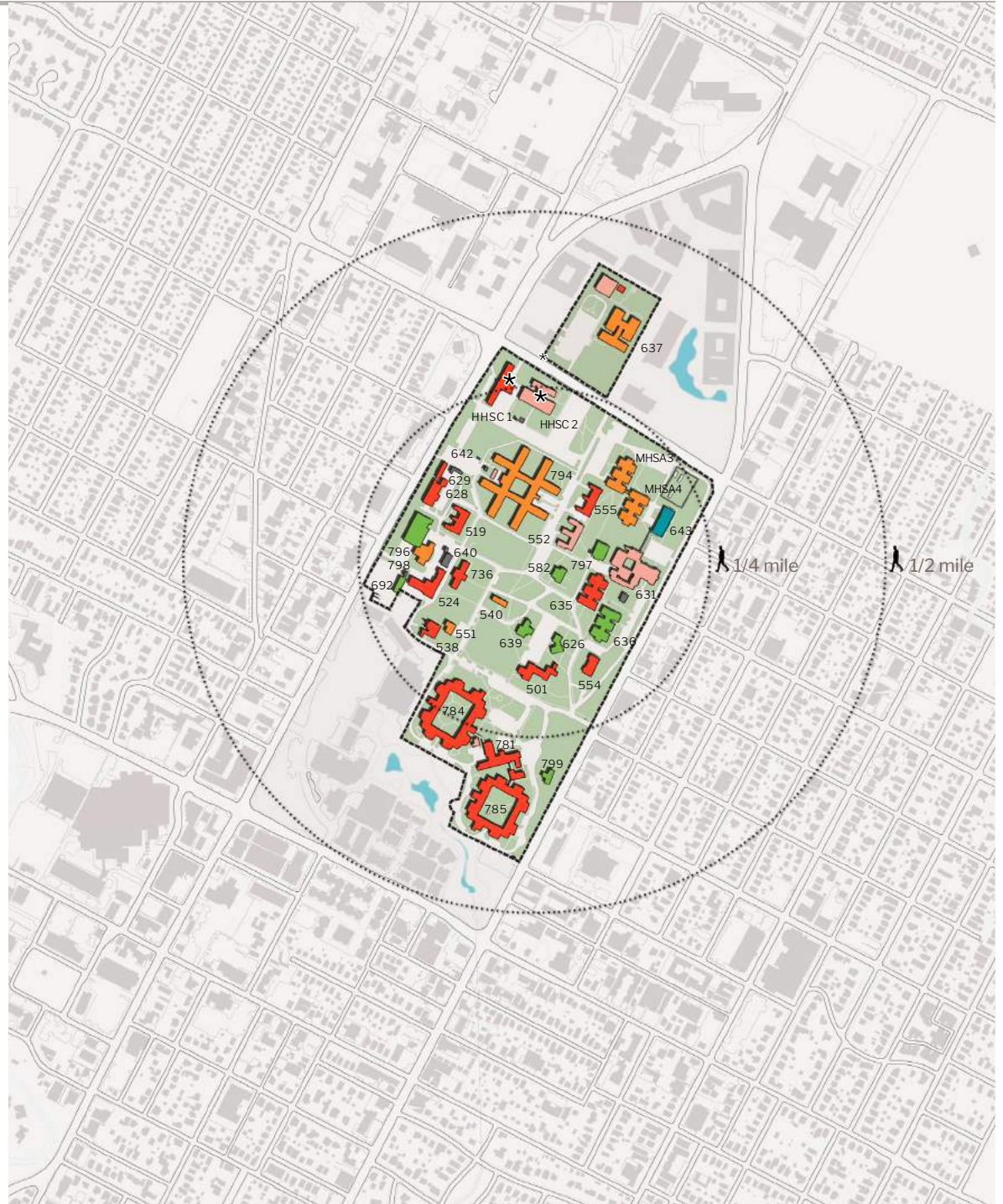
- The ASH campus has four patient buildings housing beds.
- Support services are located along the west side of the campus.
- The main administration building is housed in the original 1857 hospital building (Building 501).
- HHSC agencies are located to the north and not directly affiliated with the hospital functions.

- Day School
- Patient Occupied
- Administration
- Patient Use
- Community Partner
- Medical/Therapy
- Support
- Vacant
- Other HHSC
- Site Boundary



Buildings Condition

The majority of buildings on the ASH campus fall into the condition categories of needing moderate or major repairs.



- New
- Good
- Satisfactory
- Needs Moderate Repairs
- Needs Major Repairs
- Site Boundary

Data Source: HHSC CAFM condition code

★ Data Source: TFC owned and operated; 2016 Master Facilities Plan Report FCI data translated to HHS CAFM condition code categories

Buildings Potential Historic

The information below describes the various potential historic designations of buildings on the ASH campus.

- Building 501 on the ASH campus is designated as a State Antiquities Landmark and will be required to adhere to guidelines for this designation in any future renovation.
- The Texas Historical Commission viewed several of the older or mid-century buildings in the core of campus to have historical significance. Consequently, these are noted as potential historical buildings in the future.

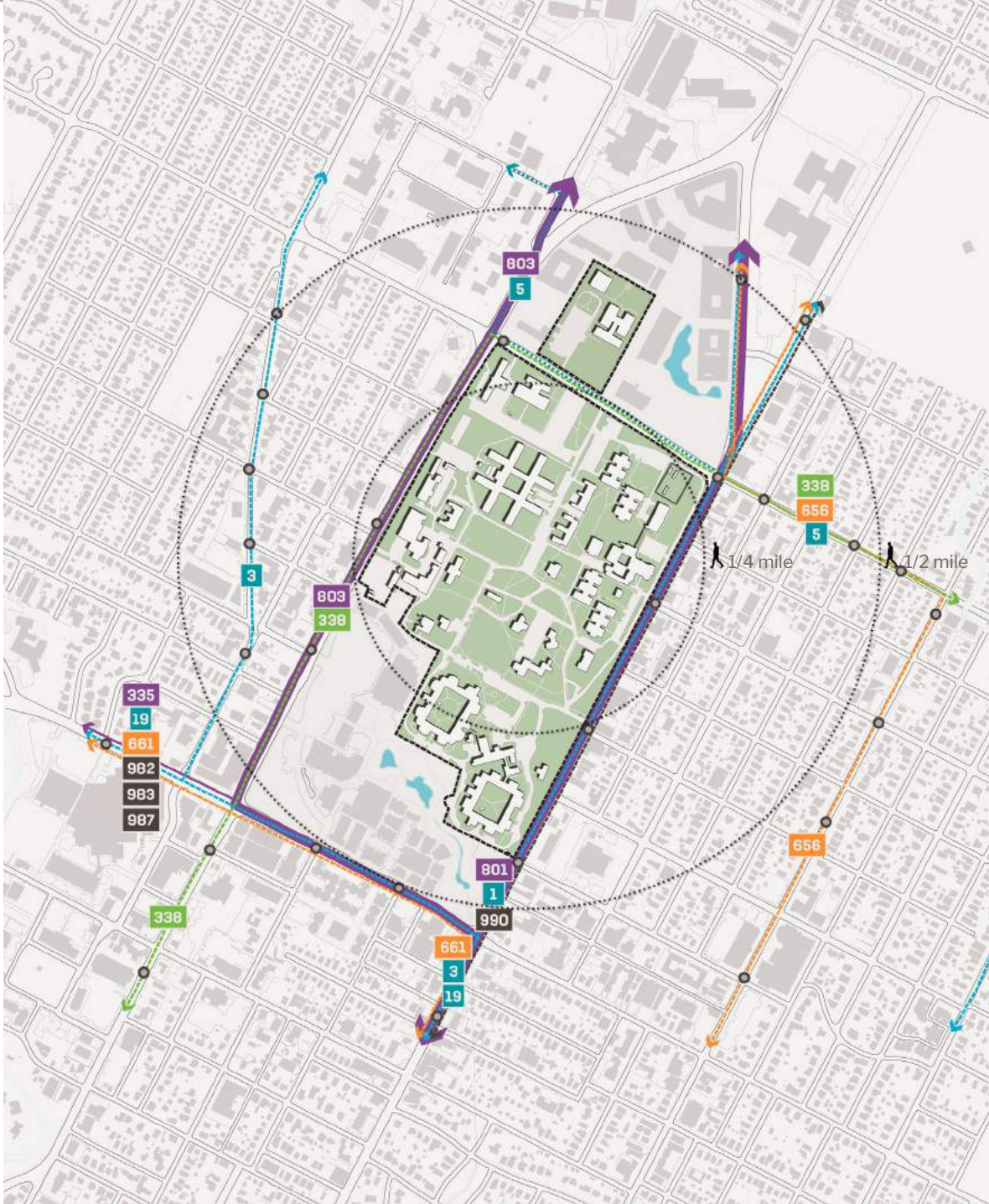


- Existing State Antiquities Landmark
- THC Historic Eligible Buildings
- THC Potential Historic Buildings
- THC Eligible Historic District
- Site Boundary

Circulation Transit

The ASH campus is connected by a variety of local and regional bus lines. Notable lines have direct access to UT-Austin and downtown Austin.

- MetroRapid service routes flank the campus along Lamar Boulevard and Guadalupe Street.
- Numerous bus stops are located along the boundaries of the campus on Lamar Boulevard, Guadalupe Street, and nearby on 38th Street.

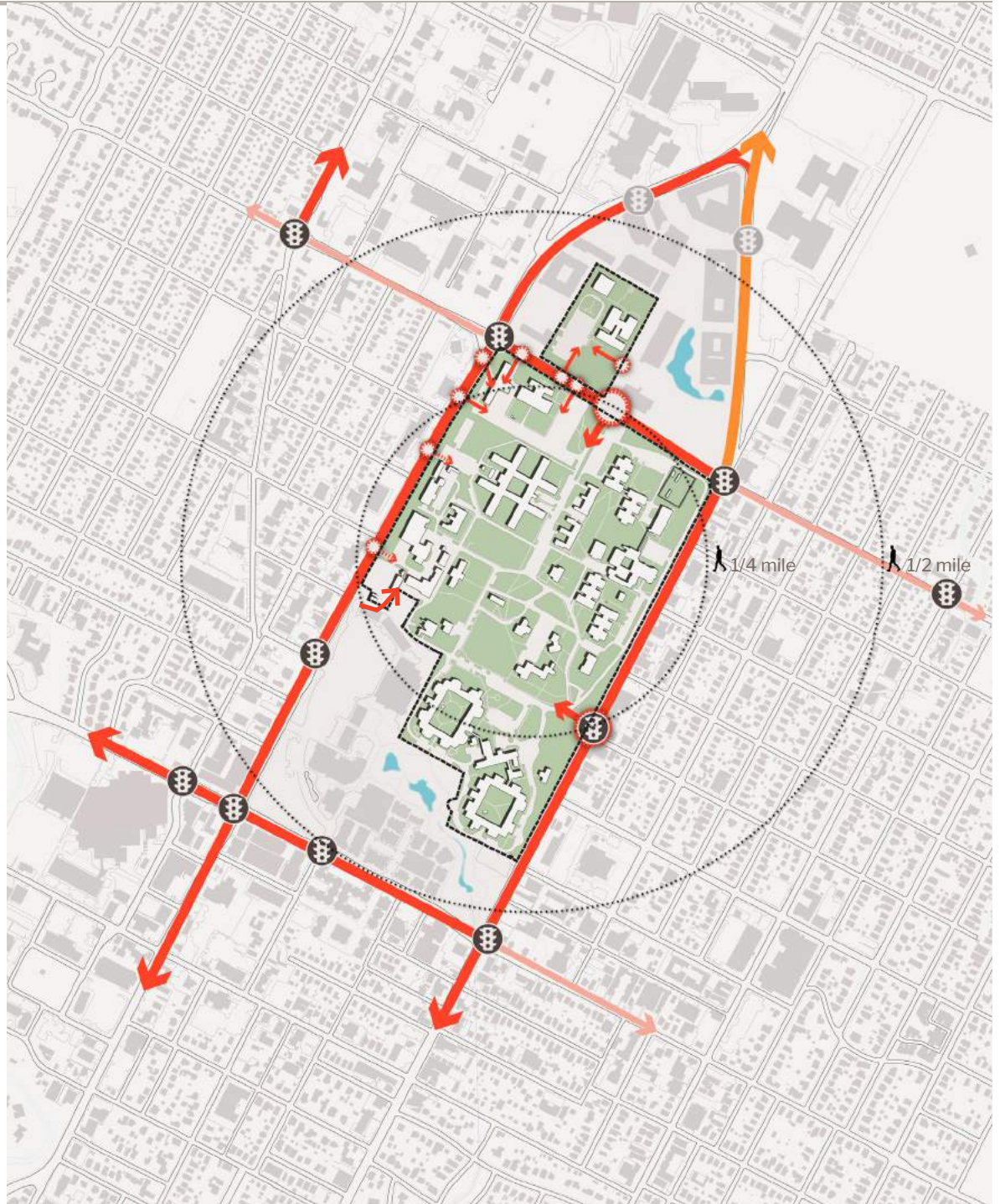


Circulation

Vehicular Parking

The site is bounded by three primary roads to the west, north, and east.

- Direct vehicular access to the ASH campus is managed through several entry points on these primary roads. The main visitors' access and formal entry to the site is located along Guadalupe Street, near W. 41st Street. Another main entrance to the site is located along W. 45th Street, across from Triangle Avenue.



- ⦿ Pedestrian crossing signal
- ⦿ Traffic signal
- Major Arterial Divided
- Major Arterial undivided
- Minor Arterial
- ➔ Entrance - Main
- ➔ Entrance - Other
- Site Boundary

Circulation Pedestrian-Bike

Several dedicated bike paths can be found on the perimeter of the site notably to the east on **Guadalupe Street** and south on **W. 38th Street** which have connections to **UT-Austin** and **downtown**.

- There are no mid-block pedestrian cross walks on W. 45th Street and one mid-block cross walk on Lamar Boulevard, W. 38th Street, and Guadalupe Street.
- Several bike friendly streets can be found to the east of campus connecting to the UT-Austin recreation fields.



- Marked Crosswalks
- Trails
- - - Bicycle Friendly Roads
- Dedicated Lanes
- - - Site Boundary

Landscape Open Space Elements

Since the ASH campus has been in existence for over a century, it contains significant numbers of mature trees that could benefit both current therapeutic environments and/or future development.

- The ASH campus has significant mature trees clustered around the original hospital and main entrance. It also has an informal lawn space in the center of campus which is utilized and valued by staff.

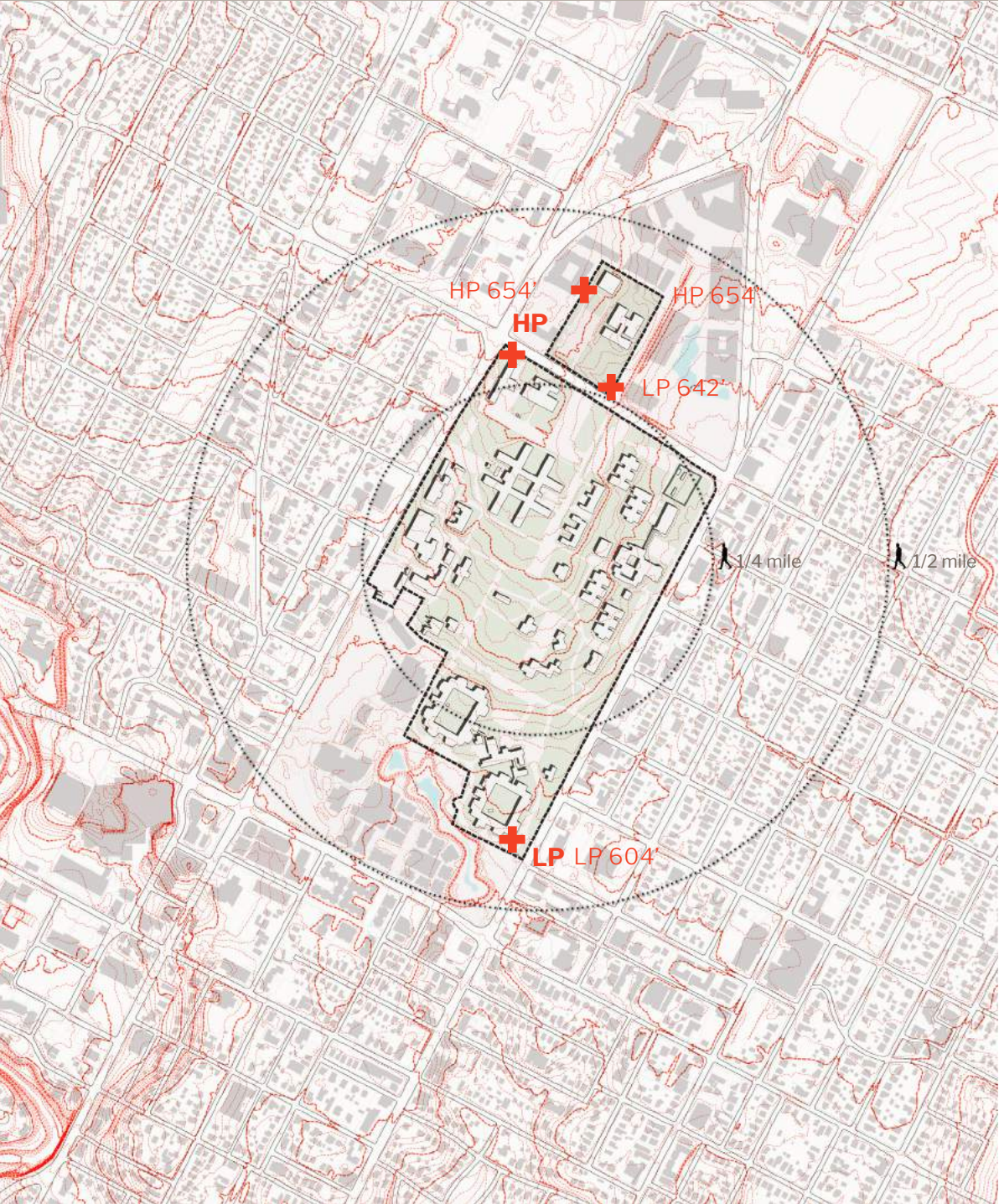
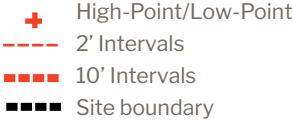
- Grouping Of Significant Trees
- Grouping Of Trees
- Open Space
- Fence
- Site Boundary



Landscape Site Topography

The site high points are located to the north and low points to the south near Central Park. Overall there's approximately a 50' difference from high point to low point.

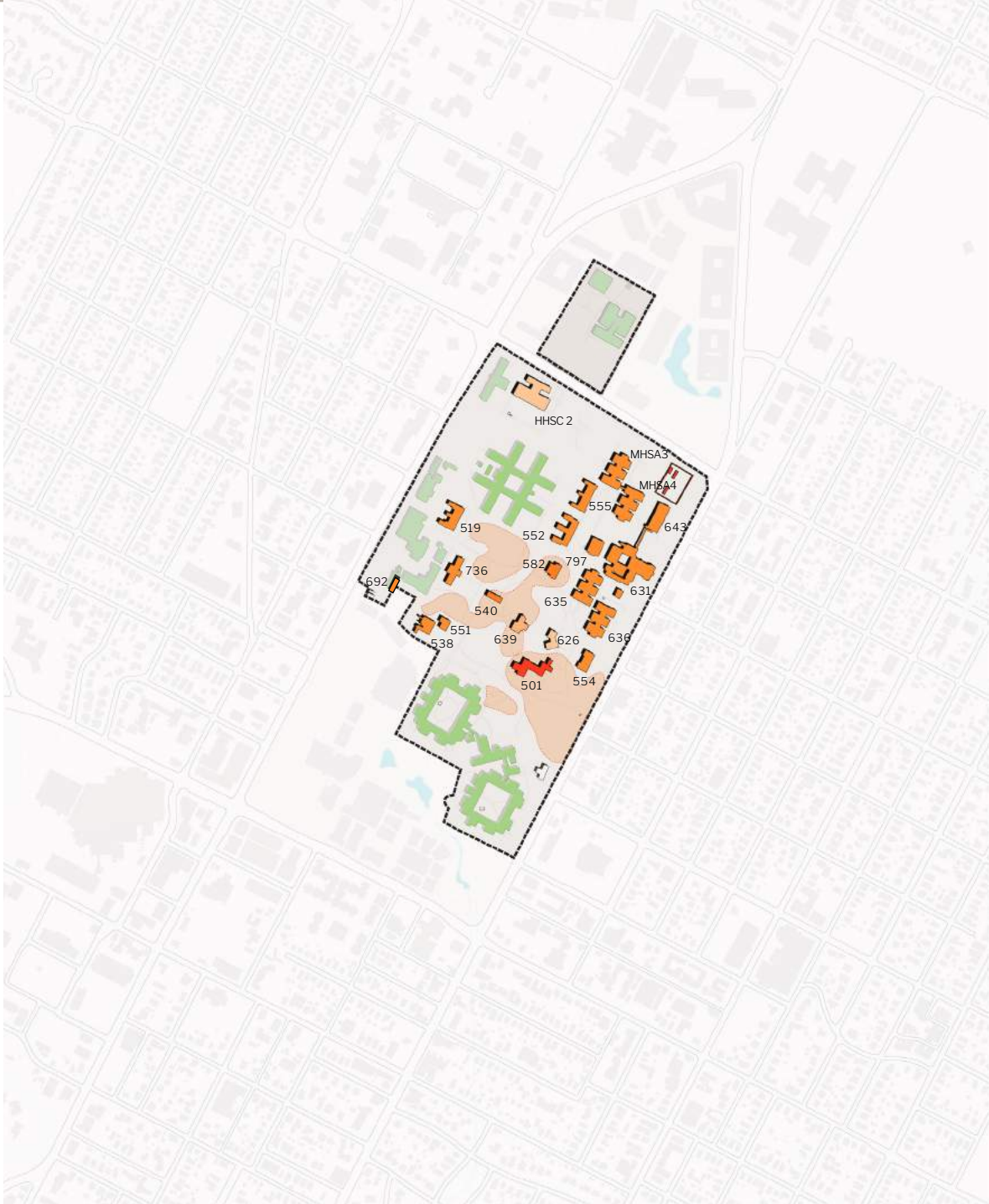
- Generally speaking there is a moderate slope of 3-5% over the span of the site.
- The campus does not have significant steep grades over 15%.
- Small areas reach grades of 10-13%



Composite Constraints

A number of constraints dot the site, some of these constraints pose more of a deterrence to potential future development than others.

- Notably Building 501 is a historically designated building, a number of potential historic buildings, infrastructure, and other significant landscape areas.



- Historic building/major infrastructure
- Potential historic/office replacement constraint
- Large Grouping of Significant trees
- SITE BOUNDARY

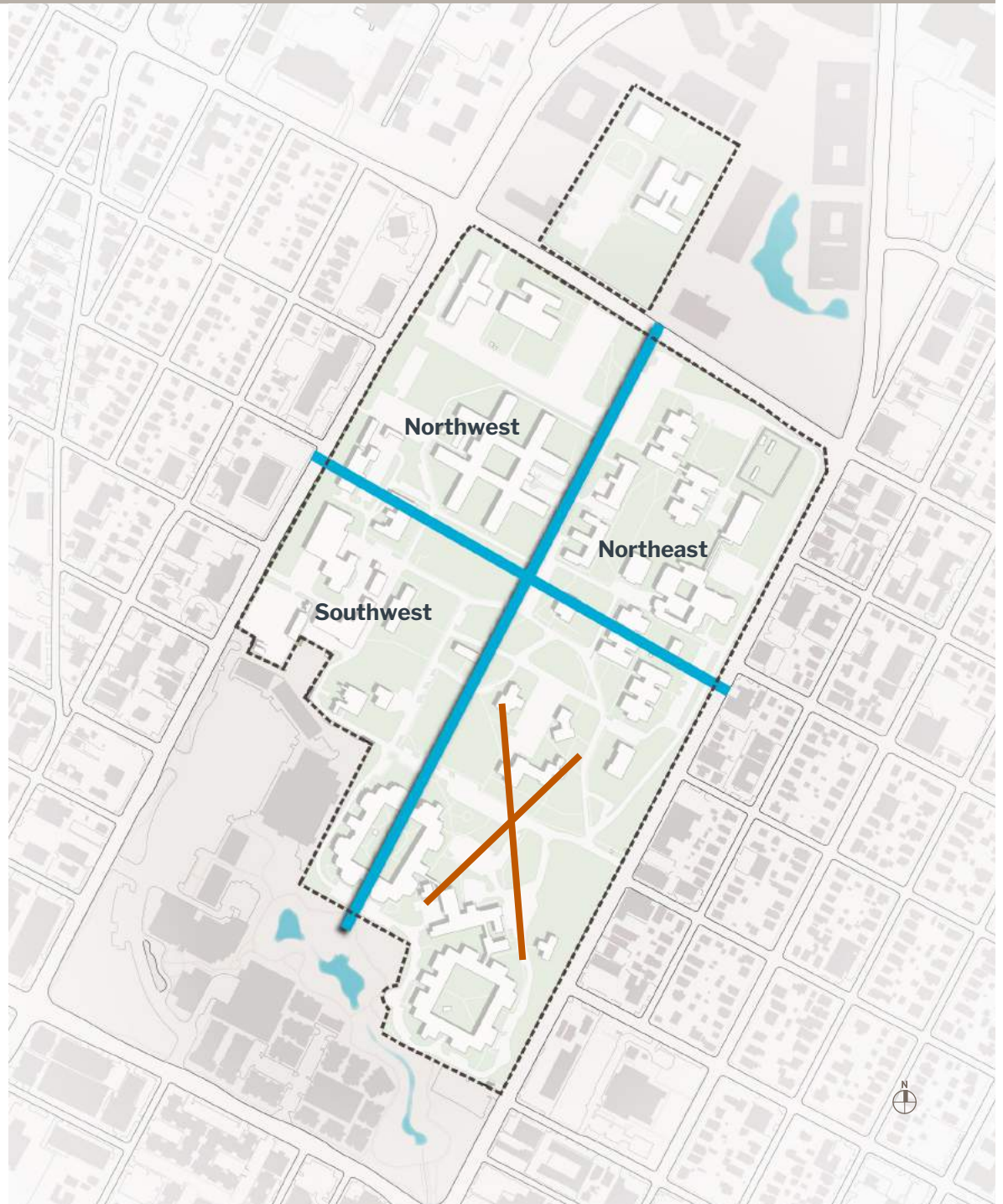
A large, stylized orange letter 'B' is positioned in the upper left corner of the page. The background of the entire page is a dark, monochromatic image of bare tree branches, creating a complex, web-like pattern.

Hospital Location Quadrant Analysis

Hospital Location Quadrant Analysis

Hospital location will drive future site planning decisions. In the diagram to the right, the campus was considered in quadrants to help focus on a hospital location.

- Southeast quadrant was excluded due to Building 501, primary site entrance, and heritage trees.
- Each of the remaining quadrants have obstacles that must be addressed:
 - Existing hospital operations
 - Historic buildings
 - Infrastructure
 - Heritage trees
 - Administrative & office functions



Northwest Quadrant

Benefits

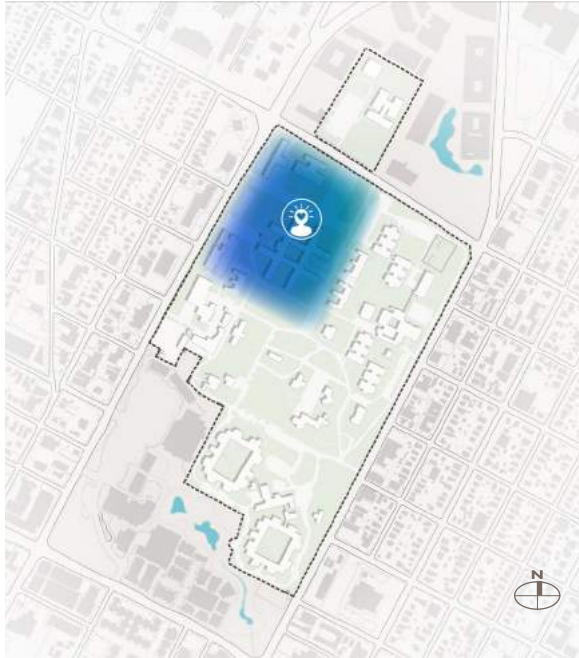
- Leaves opportunities for future front-door partner programs at 45th Street & Lamar Boulevard
- No impact on HHSC
- No impact on potential historic buildings

Challenges

- Impact on existing hospital building 794 complicates phasing
- Potential impact on Buildings 627, 628, 629
- Separates new hospital from remainder of campus



Northwest Quadrant



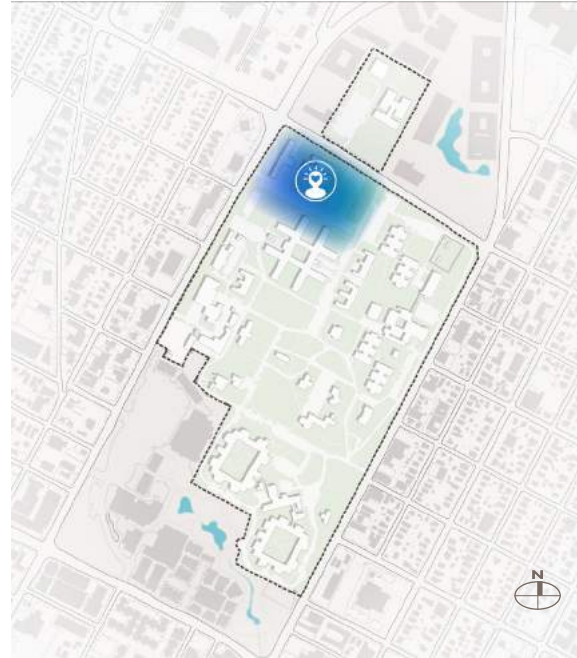
A-1-Level

Impacts

HHSC1, HHSC2, 794, 519, 628, 629, 642

Potential Impacts

555, 552, 796, Pecan Grove



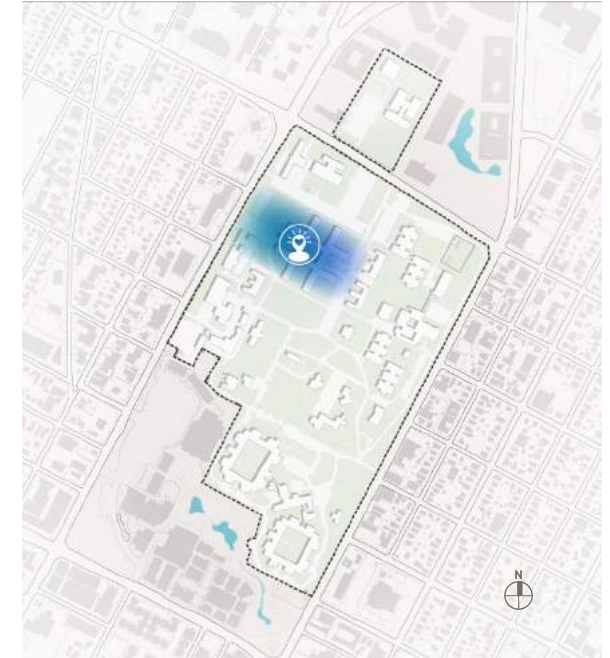
B- Multilevel - 2-Levels

Impacts

HHSC1, HHSC2

Potential Impacts

794, 629, 642



B- Multilevel - 3-Levels

Impacts

794

Potential Impacts

642, 629, 628

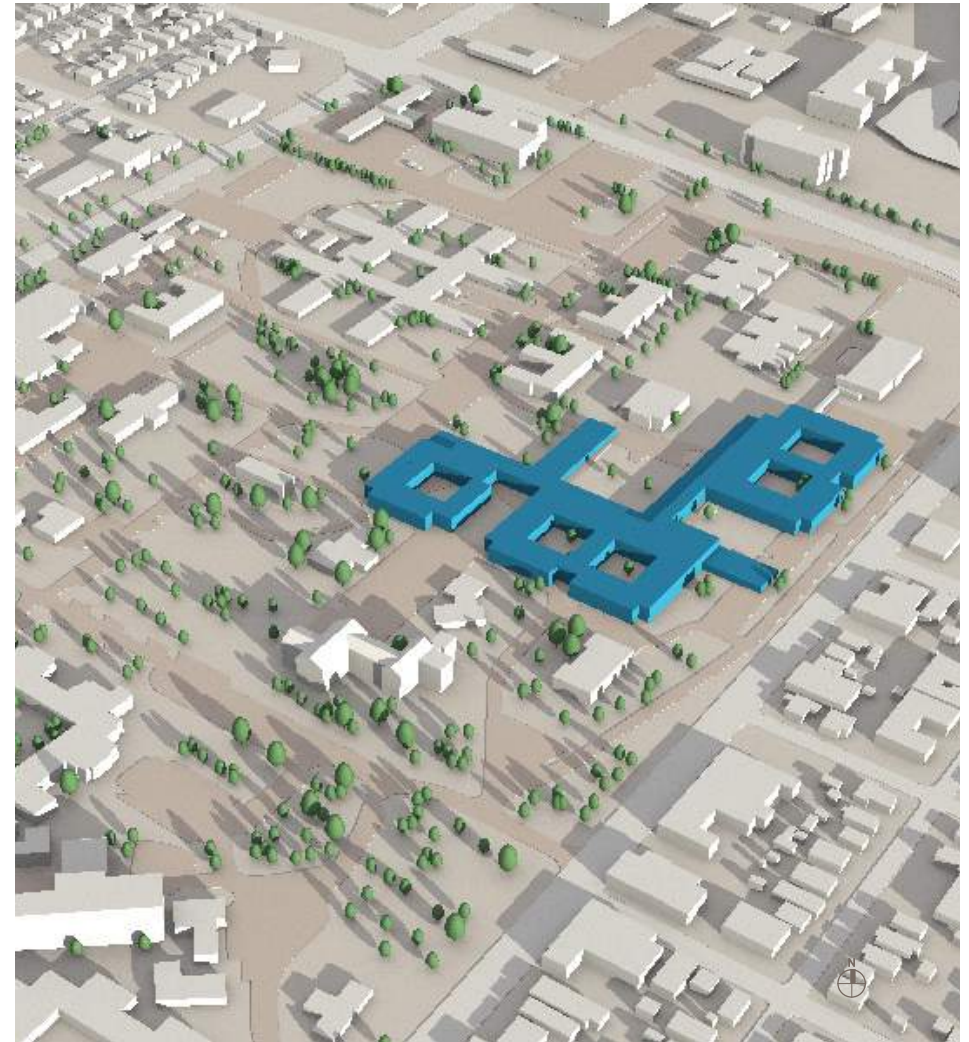
Northeast Quadrant

Benefits

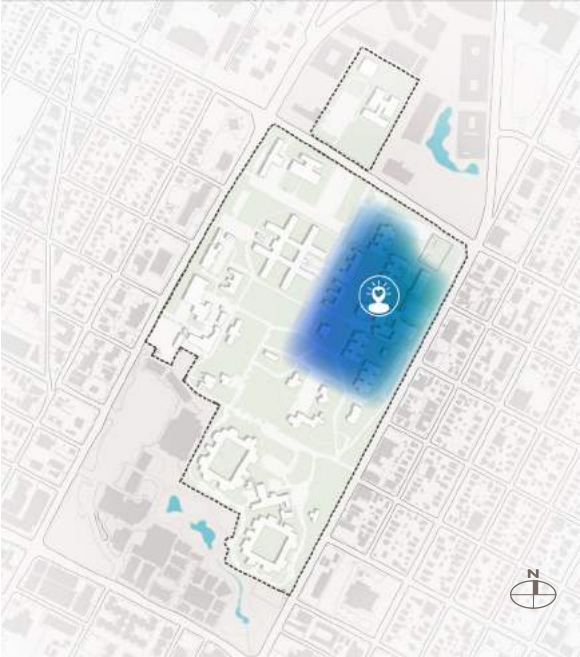
- Maximizes land for future gray boxes
- No impact on potential historic buildings
- Close proximity to historic Building 501

Challenges

- Impact on Buildings 631, 797, 635, 636
- Displacement of current employee office buildings and active hospital or partner programs



Northeast Quadrant



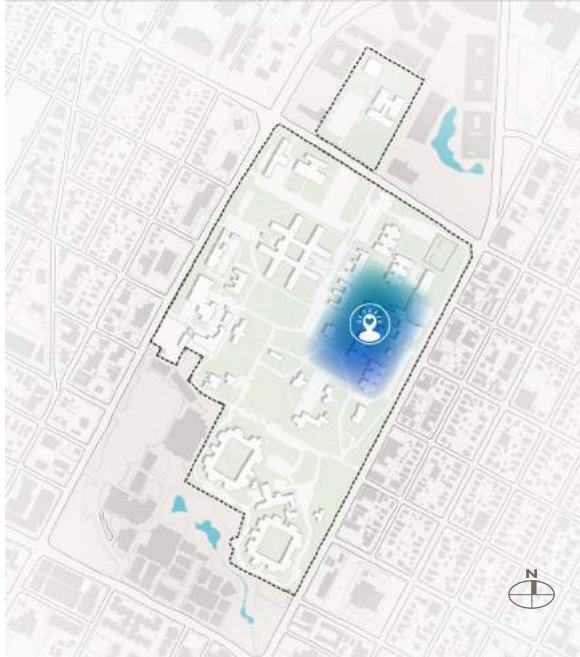
A-1-Level

Impacts

MHSA3, MHSA4, 643, 555, 552, 797, 631, 635, 636, 582

Potential Impacts

626, 639, 794



B- Multilevel - 2-Levels

Impacts

MHSA4, 552, 582, 631, 635, 636, 797

Potential Impacts

MHSA3, 555, 643, 794



B- Multilevel - 3-Levels

Impacts

MHSA4, 631, 635, 636, 343, 797

Potential Impacts

MHSA3, 552, 555, 582

Southwest Quadrant



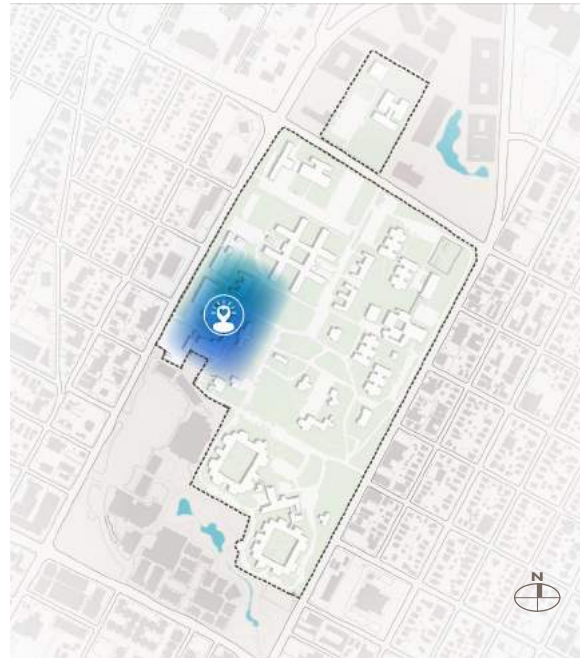
A-1-Level

Impacts

628, 629, 642, 519**, 640, 736, 524, 794, 796, 798, 692, 736**, 551**, 538**, Pecan Grove

Potential Impacts

540**



B- Multilevel - 2-Levels

Impacts

642, 628, 519, 640, 796, 798, 692, 524, 538, 551

Potential Impacts

629, 736, 794



B- Multilevel - 3-Levels

Impacts

796, 798, 692, 640, 524, 540**, 551**, 538**

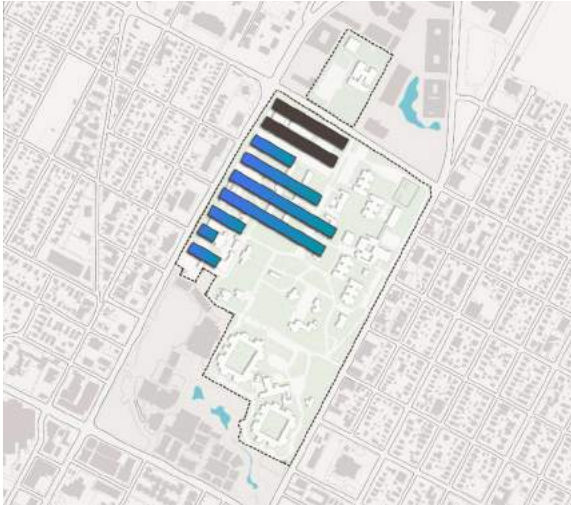
Potential Impacts

519**



Hospital Site Consumption

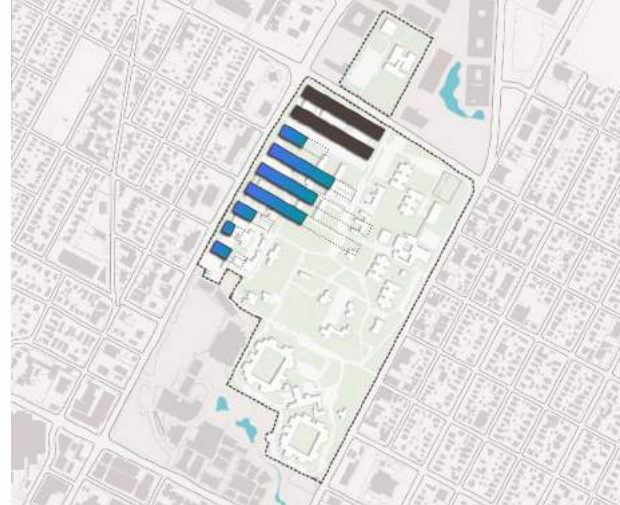
Hospital Site Consumption



Projection @ 1-Level

- A. Parking 210,000 SF (420 spaces)
- B. Program Space 29,391 GSF
- C. Utilities/Mechanical/Shared 80,920 GSF
- D. Inpatient Services 214,832 GSF
- E. Administration/Other 36,500 GSF
- F. Medical Services 15,879 GSF
- G. Support Services 27,077 GSF

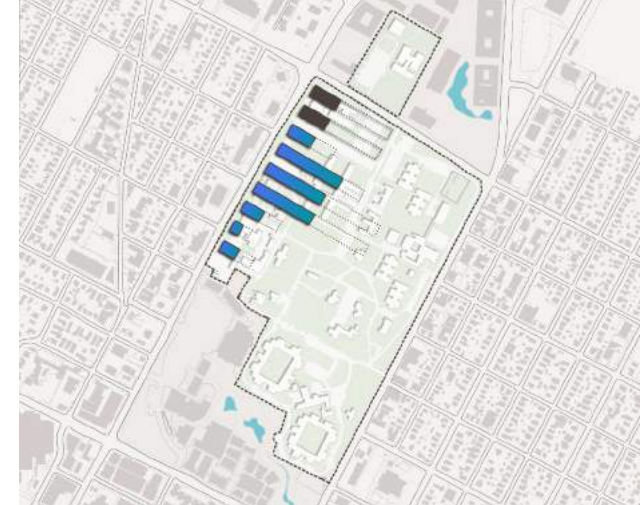
Total Footprint 614,617 GSF/SF
Total Footprint (minus parking) 404,617 GSF



Projection @ 2-Levels

- A. Parking 210,000 SF (420 spaces)
- B. Program Space 29,391 GSF
- C. Utilities/Mechanical/Shared* 60,690 GSF
- D. Inpatient Services 214,832 GSF
- E. Administration/Other 36,500 GSF
- F. Medical Services 15,879 GSF
- G. Support Services 27,077 GSF

Total Footprint 432,538 GSF/SF
Total Footprint (minus parking) 222,539 GSF

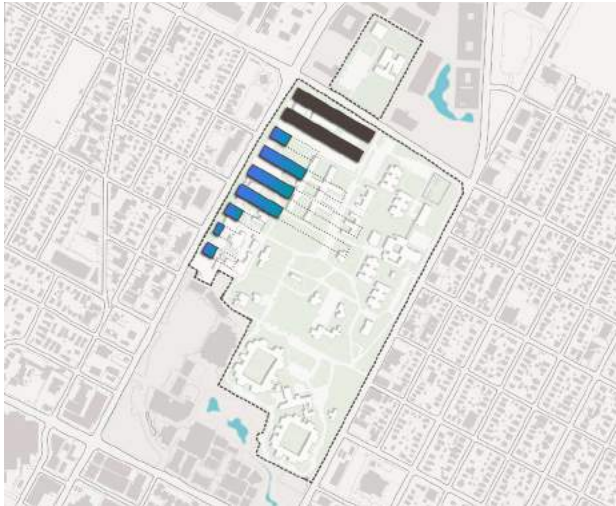


Projection @ 2-Levels (Garage)

- A. Parking 70,000 SF (420 spaces)
- B. Program Space 29,391 GSF
- C. Utilities/Mechanical/Shared* 60,690 GSF
- D. Inpatient Services 214,832 GSF
- E. Administration/Other 36,500 GSF
- F. Medical Services 15,879 GSF
- G. Support Services 27,077 GSF

Total Footprint 292,539 GSF/SF
Total Footprint (minus parking) 222,539 GSF

Hospital Site Consumption



Projection @ 3-Levels

- A. Parking 210,000 SF (420 spaces)
- B. Program Space 29,391 GSF
- C. Utilities/Mechanical/Shared* 40,460 GSF
- D. Inpatient Services 214,832 GSF
- E. Administration/Other 36,500 GSF
- F. Medical Services 15,879 GSF
- G. Support Services 27,077 GSF

Total Footprint 358,359 GSF/SF

Total Footprint (minus parking) 148,359 GSF



Projection @ 3-Levels (Garage)

- A. Parking 70,000 SF (420 spaces)
- B. Program Space 29,391 GSF
- C. Utilities/Mechanical/Shared* 60,690 GSF
- D. Inpatient Services 214,832 GSF
- E. Administration/Other 36,500 GSF
- F. Medical Services 15,879 GSF
- G. Support Services 27,077 GSF

Total Footprint 218,359 GSF/SF

Total Footprint (minus parking) 148,359 GSF



Space Model

Space Model architecture+

Benchmarking and Predictive Modeling

architecture+ has developed some tools that facilitate the reliable prediction of a hospital's size using a dataset to establish peer hospital benchmarks and a modeling tool developed for the State of New using a regression analysis of data from a large number of new psychiatric hospitals to predict both overall hospital size and the size of individual clinical settings together with their associated support and administrative functions. This tool was used to develop the space program targets that were the basis for developing critical inputs for the project's cost model and for establishing the physical building blocks used to test the site and develop this master plan.

Data Collection (Current State and Predictive)

Beyond these bed projections, trend analysis and service model changes in the context of a robust continuum of care suggest that the new hospital be developed with sufficient flexibility to facilitate:

- The re-purposing of beds for usage under other operating models or licensure
- Increased admission rates and shorter average lengths of stay
- An increased utilization by pre and post-adjudication forensic patients
- An increased utilization of in-hospital or on-campus diagnostic and treatment interventions including imaging
- A greater presence of on-site peer support services
- Greater integration of teaching, clinical practice and research including an increased presence of post-graduate medical education learners and teachers including:

- Nursing
- Medical residencies
- Post-doctoral researchers
- Social workers

Modeling

architecture+ has assembled an extensive dataset and conducted a nation-wide survey to learn which major factors influenced the square footage needed for psychiatric hospitals. With this data, they developed a standard to assist with right-sizing hospitals. architecture+ regularly updates and maintains these databases, which now include a significant number of the medium to large psychiatric hospital built in North America during the past 20 years. This allows them to project the size of hospitals and individual departments based upon a simple series of input variables. A proprietary database of over 70 public psychiatric hospitals has been developed. This wealth of information forms the bases for a number of planning tools used by the Page/architecture+ team in generating that guidance documents that establish the departmental and overall space allocations that were used to predict facility size, footprint and costs for this master plan.

Space Model architecture+



Images: Worcester Recovery Center and Hospital



Gray Box Precedents

Gray Box Precedents

Phase 3 will utilize the area of existing hospital facilities to develop gray box (partnership) opportunities. The term “gray box” refers to facilities that fulfill the continuum of brain health care, but for which the ultimate owner or operator is not yet determined. Similar brain health facilities located in Austin and around the country were used as precedent models to understand the space needs applied to the ASH campus. These facilities include the following:

Acute/Short Stay Inpatient Psychiatric Hospital

- Nationwide Children’s Hospital
- Behavioral Health Center-King’s County Hospital Center

Urgent Care/Crisis Program

- Judge Guy Herman Center for Mental Health Crisis Care

Community Health Center

- Southeast Health and Wellness Center

Residential Care Facility

- Adora Transitional Healthcare and Assisted Living

Therapeutic Housing Facility

- Housing First Oak Springs
- WakeBrook Behavioral Health Facility
- Bronx Psychiatric Center

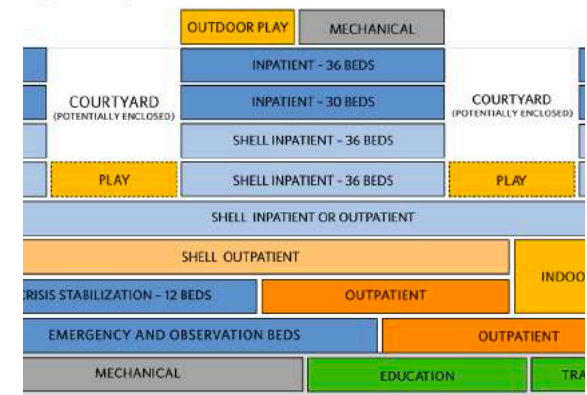
Ambulatory Care Center and Departmental Offices

- UCSF Child and Family Psychiatry Center

Acute/Short Stay Inpatient Psychiatric Hospital Nationwide Children's Hospital

One of the models used for the acute/short stay inpatient psychiatric hospital was the Nationwide Children's Hospital in Columbus, Ohio. The psychiatric wing at this facility is part of a larger hospital building.

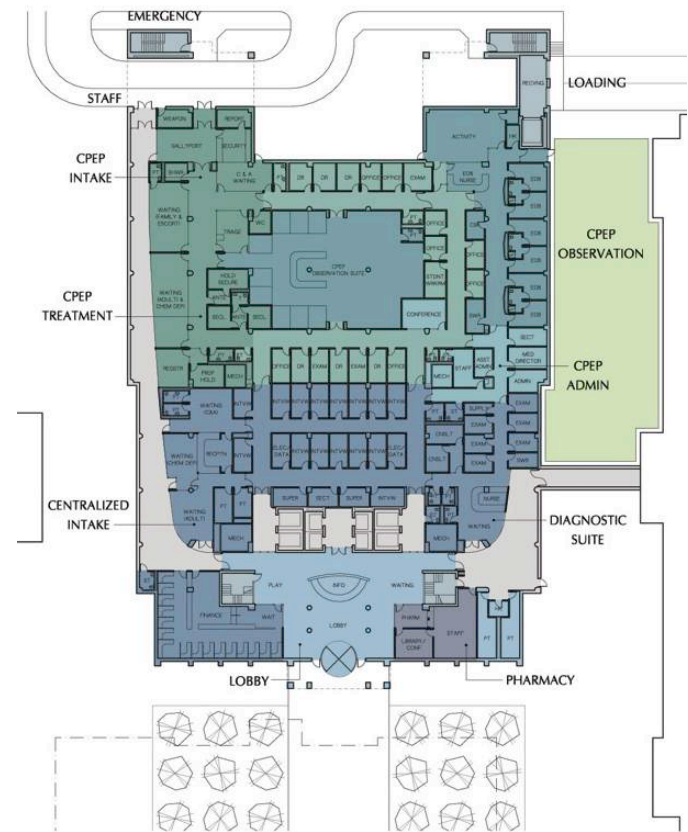
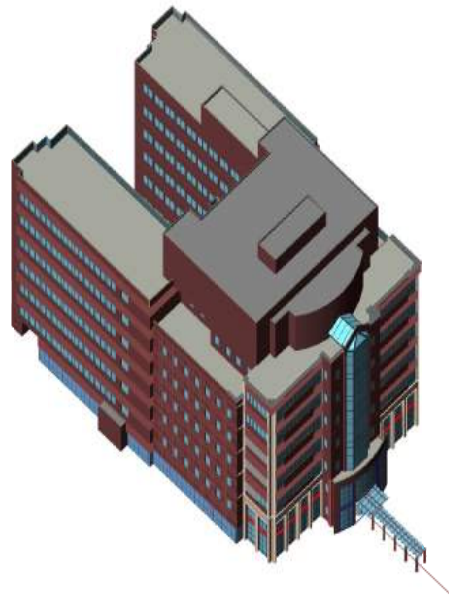
- Approximate footprint = 330'x130'
- Similar facility at ASH may include:
 - 72-120 inpatient beds
 - Admissions service
 - Bridging services
 - Mobile crisis team



Acute/Short Stay Inpatient Psychiatric Hospital Behavioral Health Center-King's County Hospital Center

A second precedent for the acute/short stay inpatient psychiatric hospital was the Behavioral Health Center at King's County Hospital Center in Brooklyn, New York.

- Approximate footprint = 252'x178'
- Similar facility at ASH may include:
 - 72-120 inpatient beds
 - Admissions service
 - Bridging services
 - Mobile crisis team



Urgent Care/Crisis Program

Judge Guy Herman Center for Mental Health Crisis Care

The model used for an Urgent Care/Crisis Program was the Judge Guy Herman Center for Mental Health Crisis Care. The facility, located in Austin, Texas, is run by the local mental health authority (LMHA) of Travis County, Integral Care.

- Approximate footprint = 100'x175'



Community Health Center Southeast Health and Wellness Center

The precedent for a community health center was the Southeast Health and Wellness Center run by a collaboration of Central Health and CommUnity Care Health Centers, a federally qualified health center (FQHC). The facility, located in southeast Austin, Texas, serves multiple healthcare needs, including psychiatry and behavioral health care.

- Approximate footprint = 150'x420'

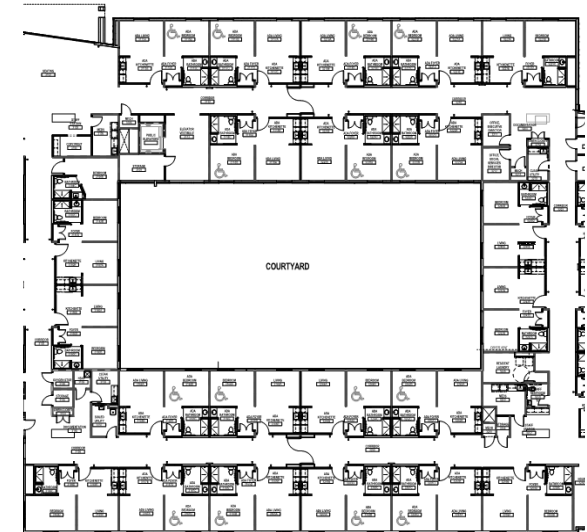


Residential Care Facility

Adora Transitional Healthcare and Assisted Living

The Adora Transitional Healthcare and Assisted Living facility in Dallas, Texas was used as a model for a residential care facility. This facility operates as a skilled nursing facility (SNF), though the gray box on the ASH campus may not require this specific designation.

- Approximate footprint = 150'x210'
- 40-50 beds



Therapeutic Housing Facility

Housing First Oak Springs

One precedent used for the therapeutic housing facility is a new building in East Austin known as Housing First Oak Springs. The facility is being developed by Integral Care.

- Approximate footprint = 130'x250'
- 50 beds



Therapeutic Housing Facility WakeBrook Behavioral Health Facility

A second example of a therapeutic housing facility is located at the WakeBrook Behavioral Health Facility in Raleigh, North Carolina, run by UNC Health Care. The campus consists of two buildings, one of which is an inpatient recovery unit.

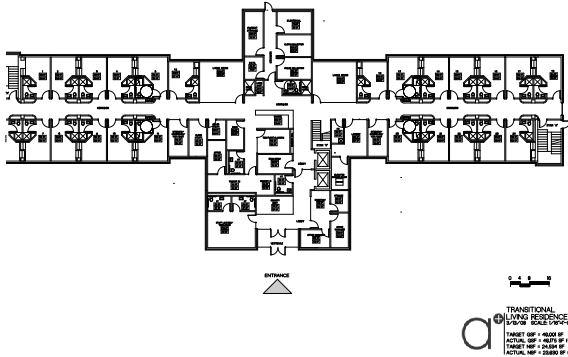
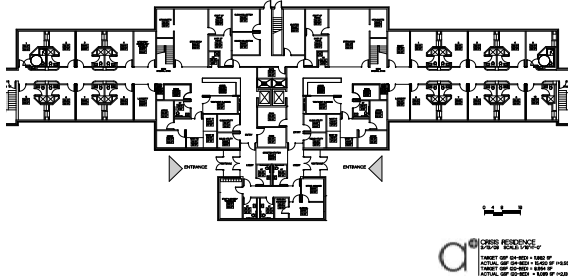
- Approximate footprint = 140'x180'
- 28 beds



Therapeutic Housing Facility Bronx Psychiatric Center

A third facility reviewed for the therapeutic housing gray box was the Bronx Psychiatric Center in Bronx, New York. The campus, operated by the New York State Office of Mental Health, includes multiple residential typologies, including studio residences, a transitional living residence, and crisis residence.

- Approximate footprint = 90'x230'
- 24+ beds

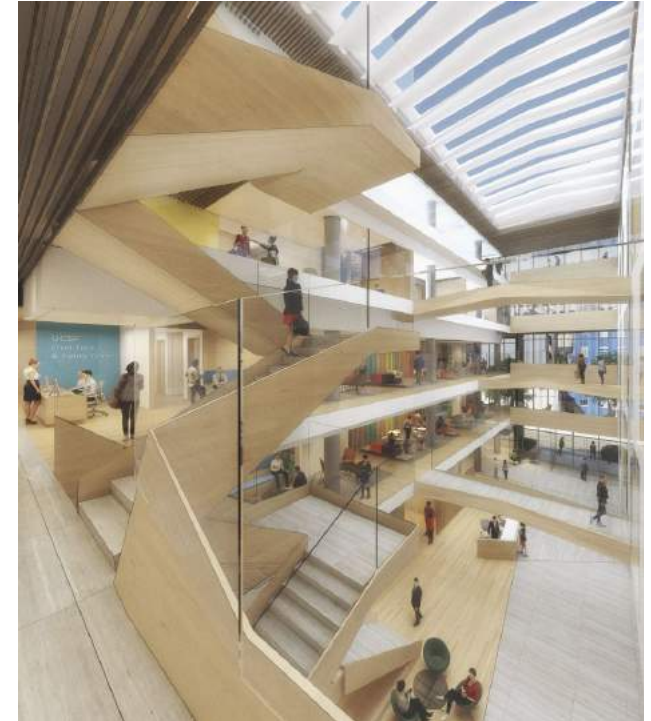
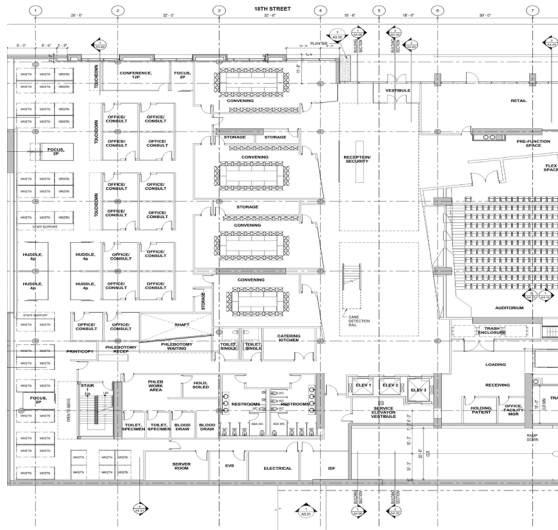


Ambulatory Care Center and Departmental Offices

UCSF Child and Family Psychiatry Center

A precedent used for the ambulatory care center and departmental offices was the UCSF Child and Family Psychiatry Center in San Francisco, California.

- Approximate footprint = 175'x200'
- Similar facility at ASH may include:
 - Ambulatory/outpatient services
 - Therapy “mall”
 - Bridging services – work skills
 - Informal partners – peer support facilities
 - Research
 - UT Department of Psychiatry
 - Consumer and professional educational center
 - Case management





Cost Estimate Details

Cost Estimate Details

Construction Cost Assumptions

- General - Costs to be considered 'order of magnitude' +/- 15% for the purpose of site selection and prioritization
- Foundations – Drilled piers with grade beams and slab on carton form
- Earthwork – Contaminated Soils have been excluded from the estimate
- Enclosure – Target of 68% skin ratio (exterior wall / GSF). 70% solid, 30% glass
- Interiors – Generally lock down ceilings
- Casework – Patient room vanities only. Bed & wardrobe part of furniture budget
- Specialties – Code min signage only. Upgrades and graphics with below the line costs
- Equipment - Cost Model assumes no major medical program: i.e. surgery, diagnostic, treatment
- Mechanical – Heating and Cooling Plant sized for standalone capacity only
- Electrical – tel/data, a/v, security and access control are carried as empty systems in the construction budget; cable and equipment below the line
- General Contractors Overhead – targeting 15% for General Conditions, General Requirements, and FEE
- Contingency – Allowing for 10% contingency in the estimate. 7% for design/estimating and 3% for the contractors construction contingency
- Site Development – site development based on historical data for 15 acre site
- Site Utilities – In addition to relocation the site development cost allow for new power and data service to the building
- Demolition – demolition costs are assumed to include hazardous material abatement

Cost Estimate Details

Master Plan Cost Summary

	Quantity	Unit	Unit Rate	Cost
Hospital - 240 Bed Program	373,869	sf	465	\$ 173,923,623
Site Development & Basic Utilities	15	acre	811,524	\$ 12,172,861
Temporary and Permanent Below Grade Utility Relocations	2000	lf	500	\$ 1,000,000
Interim Kitchen & Dishwashing Facility	34	month	123,585	\$ 4,201,875
Interim Maintenance, Linen Distribution, & Materials Management				\$ 3,000,000
Relocate HHSC Fleet & ASH Motor Pool				\$ 750,000
Abatement & Demolition to Prepare Building Site	96,100		20	\$ 1,922,000
Limited Campus Driveways	1700	lf	1,782	\$ 3,029,400
Subtotal Construction (Current Dollars)	373,869	sf	535	\$ 199,999,759
<i>Escalation - 3 years at 4% per year (midpoint of November 2021)</i>			12%	\$ 23,999,971
Total Construction (Future Dollars)	373,869	sf	599	\$ 223,999,730
<i>Project - Build-out Costs - see attached detail</i>			32%	\$ 71,679,913.53
Total Project Costs	373,869	sf	791	\$ 295,679,643

Optional Scope - See Attached Detail

Future Project Costs

Enhanced Building Program - Support Space for additional 48 beds	\$ 9,733,879
Replace Campus Electrical Switchgear & Connections (Including Building)	\$ 11,069,258
Abatement & Demolition of Existing Hospital Buildings	\$ 8,038,800
Campus Center Plaza	\$ 3,625,000
Extension of North/South Drive	\$ 3,229,875

Cost Assumptions

Costs to be considered 'order of magnitude' +/- 15% for the purpose of site selection and prioritization

Cost Model assumes no major medical program: i.e. surgery, diagnostic, treatment

Costs assume construction manager at risk including a CM contingency

Lowest floor assumed to be slab on carton form (non formed elevated structure)- \$4M add

Escalation rates are to midpoint of construction using 4% per year

Exclusions

Contaminated soils or unforeseen underground conditions

Soil retention systems

Cost Estimate Details

Build-Out Cost Items Included in 32%

- Owner Project Contingency
- Programming and OPR (Owner's Project Requirement) Fees
- AE (Architect/Engineer) Basic Services Fees
- AE Add Services Fees
- AE Reimbursable Expenses
- Site Survey and Utility Investigations
- Geotechnical Analysis and Report
- Hazardous Material Consultant and Survey
- Commissioning
- Construction Materials Testing
- Fire Alarm and Detection Testing
- Testing and Balancing
- Envelope Consulting
- Fixtures, Furniture, and Equipment
- Wayfinding
- Movable Technology and A/V (Audio/Visual) Equipment
- UT System OFPC (Office of Facilities Planning and Construction) Project Management Fees
- The University of Texas at Austin Project Management Fees
- Other Administrative Fees

Cost Estimate Details

New Construction Costs

COST MODEL SUMMARY				ASH		
Structure	Cost Model Target of 2 Stories	373,869	sf	67	\$	25,139,229
Enclosure	Cost Model Target of 70% Skin/Floor Ratio	373,869	sf	81	\$	30,152,535
Interiors		373,869	sf	90	\$	33,604,806
Mechanical		373,869	sf	94	\$	35,162,946
Electrical		373,869	sf	40	\$	15,079,383
Markups	15% OH&P, 10% contingency	373,869	sf	93	\$	34,784,725
TOTAL COST MODEL		373,869	sf	465	\$	173,923,623

STRUCTURE		Quantity	Unit	Rate	\$	
Foundations	allow for drilled pier foundations on grade beams	186,935	sf	30	\$	5,608,035
Earthwork	assume 5' of excavation and replacement with select fill	34,618	cy	35	\$	1,211,613
Lowest Floor	allow for slab on carton form	186,935	sf	20	\$	3,738,690
Upper Floor Structure	steel or concrete frame, stairs, misc metals	186,935	sf	45	\$	8,412,053
Roof Structure	structural steel roof, fireproofing, pads, dunnage - 10% overhang	205,628	sf	30	\$	6,168,839
TOTAL STRUCTURE		373,869	sf	67	\$	25,139,229

ENCLOSURE		Quantity	Unit	Rate	\$	
Cladding	<i>assume 0.68sf of exterior wall per gsf. 70% solid, 30% glass</i> solid walls - mix of brick, stone accents and metal panels	190,673	sf	45	\$	8,580,294
Backup	lgmf, avb, sheathing, rigid, spray foam, sealing & caulking, safety barricade <u>not required</u> , misc metals	190,673	sf	30	\$	5,720,196
Glazing	exterior glazing - mix of storefront and curtainwall premium for integral blinds and polycarbonate panels	63,558	sf	75	\$	4,766,830
Entrances	exterior entries - typically glazed (1/5000sf)	75	no	4,500	\$	336,482
Roofing	membrane roofing system, parapet backs, coping, flashing and accessories - assume internal drains with plumbing	205,628	sf	30	\$	6,168,839
Projections	entrance canopy, loading docks, porches, screen walls, soffits, green roofs, column covers	373,869	sf	8	\$	2,990,952
TOTAL ENCLOSURE		373,869	sf	81	\$	30,152,535

Cost Estimate Details

New Construction Costs (cont.)

INTERIORS		Quantity	Unit	Rate		\$
Partitions	block assemblies, gyp assemblies, wire mesh security partitions, polycarbonate glass allowed for break resistance [ratio 1.45]	542,110	sf	18.00	\$	9,757,981
Railings	typical egress rails	6,500	lf	125	\$	812,500
Doors	overhead coiling shutters, sally ports, glazed entrances, solid core wood doors, hollow metal support room doors [ratio 1no : 215sf]	1,739	no	2,500	\$	4,347,314
	security portal control entrances - not required	0	no	125,000	\$	-
SUBTOTAL PARTITIONS & DOORS		373,869	sf	40	\$	14,917,795
Floor Finishes	porcelain tile to washrooms, vinyl wood flooring to patient rooms, linoleum to circulation, carpet tile to administration and quiet Ares, sealed concrete at loading and mechanical [ratio 0.85]	317,789	sf	9.00	\$	2,860,098
	bases - 20% of the floor value	572,020	ls	1	\$	572,020
Ceiling Finishes	acoustic tile varieties common throughout, painted gyp soffits and detailing, metal and wood feature upgrades, paint exposed mechanical spaces [ratio 0.85]	317,789	sf	15.00	\$	4,766,830
Wall Finishes	low voc paint common throughout, ceramic tile to washrooms, wood veneer and brick veneer to common neighborhoods and main circulation spine [ratio 2.35]	878,592	sf	3.25	\$	2,855,424
	premium for tough primer - not required	373,869	gfa	0.00	\$	-
SUBTOTAL FINISHES		373,869	sf	30	\$	11,054,372
Casework	patient room vanities (bed & wardrobe as furniture), base cabinet and upper cabinets to support spaces, work counter and shelving to administrative spaces, sills, reception and display, wood blocking	11,869	lf	250	\$	2,967,214
Specialties	washroom accessories and partitions, visual display, wall protection, window treatments, lockers, fire extinguisher cabinets	373,869	gfa	4.50	\$	1,682,411
	signage and wayfinding, exterior building signage - code min	373,869	gfa	0.30	\$	112,161
	signage and wayfinding, exterior building signage - with soft costs	373,869	gfa	0.00	\$	-
Equipment	food service equipment	373,869	gfa	0.00	\$	1,750,000
	athletic equipment	373,869	gfa	0.00	\$	-
	residential kitchen equipment, loading dock equipment, av by owner	373,869	gfa	0.35	\$	130,854
Elevators		18	stp	55,000.00	\$	990,000
SUBTOTAL FITTINGS & EQUIPMENT		373,869	sf	20	\$	7,632,640
TOTAL INTERIORS		373,869	GFA	89.88	\$	33,604,806

Cost Estimate Details

New Construction Costs (cont.)

MECHANICAL		Quantity	Unit	Rate		\$
Plumbing Equipment	service entry, booster pumps, grease traps, hot water heaters, circulation pumps	373,869	sf	1.50	\$	560,804
Major Fixtures	water closets, urinals, sinks, drinking fountains, showers [ratio 1 fixture : 280sf]	1,335	no	1,600	\$	2,136,394
Minor Fixtures	food service connection, floor drains, roof drains, wall hydrants, hose bibs [ratio 1 fixture : 1000sf]	374	no	550	\$	205,628
Piping	water, sanitary, gas, storm [ratio 45lf : fixture]	76,910	lf	50	\$	3,845,510
Medical	medical outlets, equipment and gases - minimal	373,869	sf	1	\$	186,935
SUBTOTAL PLUMBING		373,869	sf	18.6	\$	6,935,270
Fire Service	service entry, fire pump, fire department connections, hose valves	373,869	sf	0.75	\$	280,402
Sprinklers	sprinklers and piping [ratio 1sprinkler : 110sf]	3,399	no	325	\$	1,104,613
	premium for safety sprinklers - 80%	2,719	no	50.00	\$	135,952
Specialty Systems	dry systems to loading, canopies, soffits - allow	373,869	sf	0.50	\$	186,935
SUBTOTAL FIRE PROTECTION		373,869	sf	4.6	\$	1,707,902
AHU's	custom air handling units, heat recovery, vfd [ratio 1cfm : 1sf]	373,869	cfm	12	\$	4,486,428
Fans	exhaust fans, return fans, vfd's [ratio 0.5cfm : 1sf]	186,935	cfm	1.50	\$	280,402
Heating Plant	boilers, pumps, heat exchangers, vfd's [ratio 1mbh : 15sf]	24,925	mbh	32.00	\$	797,587
Cooling Plant	chillers, towers, pumps, VFD's[ratio 1ton : 200sf]	1,869	ton	1,650	\$	3,084,419
Air Distribution	ductwork, vav, diffusers, grilles, dampers, insulation [ratio 1.5lbs : 1sf]	560,804	lbs	17.00	\$	9,533,660
Terminal Units	reheat coils, unit heaters, CRAC units [ratio 1no: 500sf]	748	no	650	\$	486,030
HVAC Piping	hot water, chilled water, condensate (steam not required) 100lf per terminal	74,774	lf	55	\$	4,112,559
Misc HVAC	test, balance, 3rd party assist, fuel oil system	373,869	sf	2.00	\$	747,738
Controls	DDC Controls System	373,869	sf	8.00	\$	2,990,952
SUBTOTAL HVAC		373,869	sf	71	\$	26,519,774
TOTAL MECHANICAL		373,869	GFA	94.05	\$	35,162,946

Cost Estimate Details

New Construction Costs (cont.)

<i>ELECTRICAL</i>		Quantity	Unit	Rate		\$
Normal Power	incoming feeder, substation, panelboard, feeder, grounding [ratio 1A : 100sf]	3,739	A	500.00	\$	1,869,345
Emergency Power	generator, ATS, switch gear, panelboards, feeder[ratio 1KW: 200sf]	1,869	kw	1,500	\$	2,804,018
Motor Wiring	power to mechanical equipment	373,869	sf	2	\$	747,738
<i>SUBTOTAL SERVICE & DISTRIBUTION</i>		373,869	sf	14.5	\$	5,421,101
Lighting	Light Fixtures - LED, wiring, switching [ratio 1fixture : 50sf]	7,477	no	600	\$	4,486,428
	lighting controls	373,869	sf	1.5	\$	560,804
Branch Power	branch power outlets [ratio 1no : 60sf]	6,231	no	330	\$	2,056,280
<i>SUBTOTAL LIGHTING & DEVICES</i>		373,869	sf	19.0	\$	7,103,511
Fire Alarm	full fire alarm system	373,869	sf	3.0	\$	1,121,607
Tel/Data	conduit drops, cable tray. Soft Costs included - horizontal cable, backbone/fiber, equipment[ratio 1drop : 250sf]	1,246	no	250	\$	311,558
Security	security & access control: empty system [ratio 1drop : 300sf]	373,869	sf	0.5	\$	186,935
Other Systems	lightning protection, DAS, nurse call, clock, a/v infrastructure, misc electrical	373,869	gfa	2.50	\$	934,673
<i>SUBTOTAL LOW VOLTAGE SYSTEMS</i>		373,869	sf	7	\$	2,554,772
TOTAL ELECTRICAL		373,869	GFA	40.33	\$	15,079,383
<i>SUBTOTAL DIRECT CONSTRUCTION COSTS</i>		373,869	sf	372	\$	139,138,898
<i>MARKUPS</i>						
Overhead & General Conditions	general conditions (labor), general requirements (hoisting, trailers, temp provisions), insurance & bonds, fee	15%			\$	20,870,835
Design Contingency	maintained low as this should be a ROM range. Above costs should be achievable as a design to budget	7%			\$	9,739,723
Escalation Contingency	see project summary - costs in current dollars	0%			\$	-
Construction Contingency	CM construction contingency - change orders with owner soft costs	3%			\$	4,174,167
<i>SUBTOTAL MARKUPS</i>		373,869	sf	93	\$	34,784,725
<i>TOTAL ESTIMATED CONSTRUCTION COSTS</i>		373,869	sf	465	\$	173,923,623

Cost Estimate Details

Optional Costs

	sf	\$/sf	Construction	Escalation	Soft Costs	Future Project Costs
Replace Campus Electrical Switchgear & Connections			\$ 8,079,750	12%	25%	\$ 11,069,258
Abatement & Demolition of Existing Hospital Buildings	277,200	20	\$ 5,544,000	20%	25%	\$ 8,038,800
Campus Center Plaza	25,000	100	\$ 2,500,000	20%	25%	\$ 3,625,000
Extension of North/South Drive (1250lf x 40')	50,000	45	\$ 2,227,500	20%	25%	\$ 3,229,875

Site Development Costs

Assume 15 Acre Development (net of building footprint)

		Quantity	Unit	Rate	\$
Site Preparation	clear vegetation, demo utilities, rough grading, construction entrances, construction fencing, erosion control	466,466	sf	1.50	\$ 699,698
Hardscape	roads, parking, sidewalks, curbs - 40% of site - reinforced concrete	186,586	sf	10.0	\$ 1,865,862
	premium for features/plaza's - 10% of hardscape	18,659	sf	25.0	\$ 466,466
	premium for patient courtyards	80,000	sf	20.0	\$ 1,600,000
Improvements	retaining walls, landscape walls, railings, signage, bike racks, trellis, water features (NIC)	466,466	sf	1.5	\$ 699,698
Softscape	top soil (4"), trees, shrubs, groundcover, irrigation (full site)	279,879	sf	4.0	\$ 1,119,517
Civil	water, fire, sanitary	6,000	lf	125.0	\$ 750,000
	storm main, storm branch, landscape	3,500	lf	125.0	\$ 437,500
	storm water retention - allow	466,466	sf	0.75	\$ 349,849
Mechanical	hot water, chilled water, vaults - not required	0	lf	1,000.0	\$ -
Electrical	primary ductbank (dual feed), telecom ductbank	2,000	lf	400.0	\$ 800,000
	secondary ductbank, building switch, building transformer	250,000	ls	1.0	\$ 250,000
	lighting - street lights, pedestrian lights, landscape lights	466,466	sf	1.5	\$ 699,698
Subtotal Site Development		466,466	sf	20.9	\$ 9,738,289
Overhead & Gen Cond.				15%	\$ 1,460,743
Design Contingency	maintained low as this should be a ROM range. Above costs should be achievable as a design to budget			7%	\$ 681,680
Escalation Contingency	see project summary - costs in current dollars			0%	\$ -
Construction Contingency	CM construction contingency - change orders with owner soft costs			3%	\$ 292,149
Total Site Development		466,466	sf	26.1	\$ 12,172,861
Acre		15.0	acre	811,524	\$ 12,172,861

Cost Estimate Details

Cost of Limited Campus Drives

Allow 1700lf x 40' wide		Quantity	Unit	Rate	\$
Site Preparation	clear paving/vegetation	68,000	sf	2.00	\$ 136,000
Hardscape	concrete paving	68,000	sf	9.0	\$ 612,000
	curbs	3,400	lf	25.0	\$ 85,000
Improvements	retaining walls, landscape walls, railings, signage, bike racks	68,000	sf	2.0	\$ 136,000
Softscape	top soil (4"), trees, shrubs, groundcover, irrigation (30% additional project area)	17,000	sf	5.0	\$ 85,000
Civil	water & sanitary	3,400	lf	125.0	\$ 425,000
	storm main and inlets	1,700	lf	250.0	\$ 425,000
Electrical	primary ductbank (dual feed), telecom ductbank	0	lf	350.0	\$ -
	lighting - street lights, pedestrian lights, landscape lights	1,700	lf	200.0	\$ 340,000
Subtotal Site Development		68,000	sf	33.0	\$ 2,244,000
Overhead & Gen Cond.				15%	\$ 336,600
Logistics & Traffic Control				10%	\$ 224,400
Design Contingency	maintained low as this should be a ROM range. Above costs should be achievable as a design to budget			7%	\$ 157,080
Escalation Contingency	see project summary - costs in current dollars			0%	\$ -
Construction Contingency	CM construction contingency - change orders with owner soft costs			3%	\$ 67,320
Total Site Development		68,000	sf	44.6	\$ 3,029,400

Cost Estimate Details

Cost of Modular/Interim Kitchen and Storage

	Quantity	Unit	Rate	\$
Setup & Remove	190,000	ls	1	\$ 190,000
Transportation	130,000	ls	1	\$ 130,000
Cleaning	15,000	ls	1	\$ 15,000
Rental Fees	34	month	80000	\$ 2,720,000
<u>Site Enabling</u>				
Site Preparation	clear paving/vegetation	10,000	sf	2.00 \$ 20,000
Hardscape	concrete paving	6,000	sf	9.0 \$ 54,000
Improvements	retaining walls, landscape walls, railings, signage, bike racks, trellis, water features (NIC)	10,000	sf	2.0 \$ 20,000
Softscape	top soil (4"), trees, shrubs, groundcover, irrigation (30% additional project area)	2,500	sf	5.0 \$ 12,500
Mech Utilities	water, fire, sanitary, gas	800	lf	125.0 \$ 100,000
Electrical	electrical services	100,000	ls	1.0 \$ 100,000
Subtotal Construction				\$ 3,361,500
Overhead & Gen Cond.			15%	\$ 504,225
Design Contingency	maintained low as this should be a ROM range. Above costs should be achievable as a design to budget			7% \$ 235,305
Escalation Contingency	see project summary - costs in current dollars			0% \$ -
Construction Contingency	CM construction contingency - change orders with owner soft costs			3% \$ 100,845
Total Construction	5,000		840	\$ 4,201,875

Inclusions
Skinks/tables/shelving/mech/hoods

Exclusions
Tray line
Table Top Equipment
Small Wares
Offices
Restrooms

Cost of Electrical Relocation

	Quantity	Unit	Rate	\$
Main Campus Switchgear	1	no	250000	\$ 250,000
Emergency Generator	1	no	500000	\$ 500,000
Transfer Switches	2	no	100000	\$ 200,000
Emergency Gear	1	no	250000	\$ 250,000
Building Load Switches	3 x 200A MV fuses each	6	no	150000 \$ 900,000
Feeder		2,250	lf	500 \$ 1,125,000
Reconnection of Existing		8	no	25000 \$ 200,000
Relocation of Underground		1,000,000	ls	1 \$ 1,000,000
Associated Site Paving Work		250,000	ls	1 \$ 250,000
Demo Existing & Building		150,000	ls	1 \$ 150,000
New Building Enclosure		5,000	sf	250 \$ 1,250,000
Subtotal Construction				\$ 6,075,000
Overhead & Gen Cond.			15%	\$ 911,250
Design Contingency	maintained low as this should be a ROM range. Above costs should be achievable as a design to budget			15% \$ 911,250
Escalation Contingency	see project summary - costs in current dollars			0% \$ -
Construction Contingency	CM construction contingency - change orders with owner soft costs			3% \$ 182,250
Total Construction				\$ 8,079,750

Cost Estimate Details

Hospital Configuration Scheme Analysis



	Courtyard 2 Schemes	T Scheme - Partial 3 Story	L Scheme 2 Story	Spine Scheme 2 Stories
Bed & Treatment	200,836	203,766	209,348	209,112
Medical	13,108	13,260	11,884	14,090
Downtown	20,929	27,481	23,874	23,488
Admin & entry	28,863	29,541	28,642	30,933
Support	46,753	43,597	42,543	42,589
Subtotal	310,489	317,645	316,291	320,212
Grossing	42,290	35,134	36,488	32,567
Total	352,779	352,779	352,779	352,779

Adaptive Re-use DGSF	35,600	35,600	35,600	
Total Reno	35,600	35,600	35,600	
Total New	317,179	317,179	317,179	352,779

Area Breakdown				
L1	168,030	132,706	170,130	185,426
L2	149,149	130,444	147,049	167,353
L3	-	54,029	-	-
Reno	35,600	35,600	35,600	-
Total	352,779	352,779	352,779	352,779

Exterior Wall	55%	192,838	70%	245,830	61%	216,924	55%	192,501
Articulation	5%	9,642	5%	12,292	5%	10,846	5%	9,625
Reno Walls Allow	50%	17,800	50%	17,800	50%	17,800	50%	-
Total Exterior Wall	62%	220,280	78%	275,922	70%	245,570	57%	202,126
Standard Roof		163,730		128,244		163,380		180,727
Green Roof		4,300		4,462		6,750		4,699
Balcony		2,300		6,000		11,050		10,965
Internal Courtyard		99,022		66,812		105,871		43,102
Allow Overhangs	10%	16,803	10%	13,271	10%	17,013	10%	18,543
Actual Roof Area		187,133		151,977		198,193		214,934

Cost Analysis With only Configuration Drivers

	Quantity	Unit	Rate	\$	Quantity	Unit	Rate	\$	Quantity	Unit	Rate	\$	Quantity	Unit	Rate	\$
Foundations	168,030	sf	30	\$ 5,040,900	132,706	sf	30	\$ 3,981,180	170,130	sf	30	\$ 5,103,900	185,426	sf	30	\$ 5,562,780
Earthwork	31,117	cy	35	\$ 1,089,083	24,575	cy	35	\$ 860,131	31,506	cy	35	\$ 1,102,694	34,338	cy	35	\$ 1,201,835
Lowest Floor	168,030	sf	20	\$ 3,360,600	132,706	sf	20	\$ 2,654,120	170,130	sf	20	\$ 3,402,600	185,426	sf	20	\$ 3,708,520
Renovated Lowest Floor	35,600	sf	25	\$ 890,000	35,600	sf	25	\$ 890,000	35,600	sf	25	\$ 890,000	0	sf	25	\$ -
Upper Floor Structure	149,149	sf	45	\$ 6,711,705	184,473	sf	45	\$ 8,301,285	147,049	sf	45	\$ 6,617,205	167,353	sf	45	\$ 7,530,885
Roof Structure	187,133	sf	35	\$ 6,549,655	151,977	sf	35	\$ 5,319,181	198,193	sf	35	\$ 6,936,755	214,934	sf	35	\$ 7,522,676
Renovated Roof Structure	35,600	sf	25	\$ 890,000	35,600	sf	25	\$ 890,000	35,600	sf	25	\$ 890,000	0	sf	25	\$ -
Cladding	154,196	sf	45	\$ 6,938,817	193,145	sf	45	\$ 8,691,527	171,899	sf	45	\$ 7,735,461	141,488	sf	45	\$ 6,366,971
Backup	154,196	sf	35	\$ 5,396,858	193,145	sf	35	\$ 6,760,077	171,899	sf	35	\$ 6,016,470	141,488	sf	35	\$ 4,952,088
Glazing	66,084	sf	75	\$ 4,956,298	82,776	sf	75	\$ 6,208,234	73,671	sf	75	\$ 5,525,330	60,638	sf	75	\$ 4,547,836
Glazing Premium	66,084	sf	25	\$ 1,652,099	82,776	sf	25	\$ 2,069,411	73,671	sf	25	\$ 1,841,777	60,638	sf	25	\$ 1,515,945
Entrances	34	no	5,000	\$ 168,030	27	no	5,000	\$ 132,706	34	no	5,000	\$ 170,130	37	no	5,000	\$ 185,426

Cost Estimate Details

Hospital Configuration Scheme Analysis (cont.)



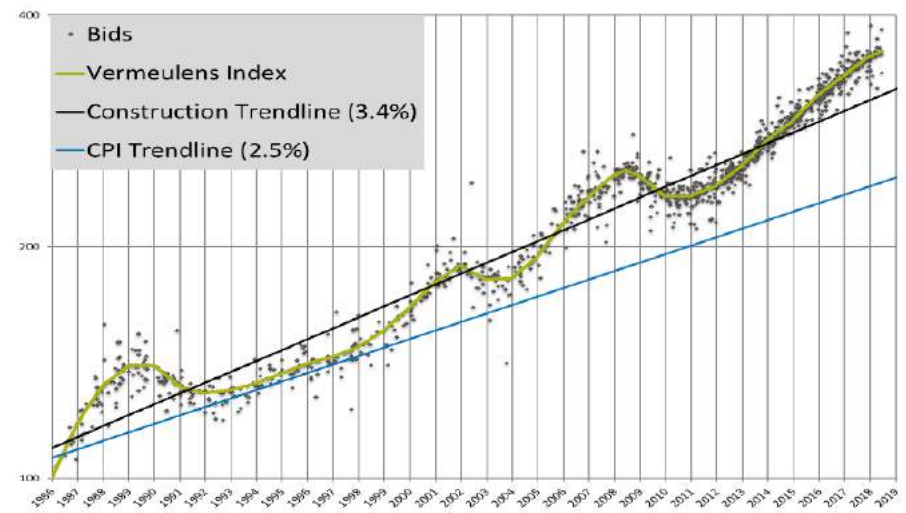
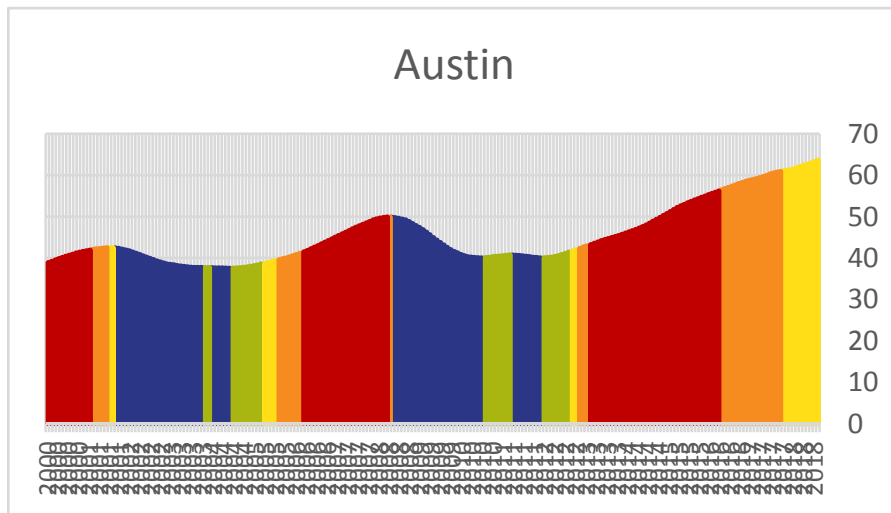
Roofing	222,733	sf	30	\$	6,681,990	187,577	sf	30	\$	5,627,298	233,793	sf	30	\$	7,013,790	214,934	sf	30	\$	6,448,008
Egress Stairs	24	no	25,000	\$	600,000	36	no	25,000	\$	900,000	36	no	25,000	\$	900,000	20	no	25,000	\$	500,000
Elevator Stops	12	stp	55,000	\$	660,000	18	stp	55,000	\$	990,000	18	stp	55,000	\$	990,000	10	stp	55,000	\$	550,000
Balcony	2,300	sf	200	\$	460,000	6,000	sf	200	\$	1,200,000	11,050	sf	200	\$	2,210,000	10,965	sf	250	\$	2,741,250
Green Roof	4,300	sf	100	\$	430,000	4,462	sf	100	\$	446,200	6,750	sf	100	\$	675,000	4,699	sf	100	\$	469,900
Total	352,779	sf	149		52,476,035	352,779	sf	159		55,921,350	352,779	sf	164		58,021,112	352,779	sf	153		53,804,120

Cost Estimate Details

Market and Construction Escalation

Austin, Texas has been, and is assumed to continue to be, a very busy and volatile construction market. Because of this we have included within the cost estimates 1% per quarter escalation factor to the mid-point of construction, as well as a 5% factor for market conditions.

Vermeulens has tracked market escalation for more than 40 years. The primary driver in cost escalation is the growth rate/decline of construction labor in a market. Below is the current data for Austin along with our historical tracking of cost escalation.



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Acknowledgments

Acknowledgments

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Planning Team

Page	Project Lead: Planning, Urban Design, Architecture, Landscape
architecture+	Programming, Architecture
Vermeulens	Cost Estimating
Kitchens to Go	Modular Kitchen Advising