Section 04 | Programming

Facilities Planning and Construction
Division of Administration
& Finance

January 2025

Introduction

The University of Houston follows a Capital Improvement Program (CIP), a five-year plan that details the long-range strategy to maintain and enhance the System's resources. The CIP allows for strategic planning for projects with a debt load over $5 million.

Once a project has been identified in the CIP, the project may begin programming. The University of Houston System requires each capital project to be defined by a comprehensive program of requirements with a detailed cost estimate. Once programming is complete and funding has been identified, the project may be presented to the Board of Regents for approval to begin design.

A complete facility program helps to reduce the number of changes and potential cost increases that can occur during a project. Other benefits include:

- Campus stakeholders have an early opportunity to provide input and discuss issues.
- Project scope and needs can be developed into well-defined requirements before engaging architects and engineers to begin design.
- Concepts can be tested, and various options evaluated inexpensively during programming.

Definition

Facility programming is the process of collecting, analyzing, synthesizing and documenting the requirements for a capital improvement project prior to beginning design. The final program document becomes a "building instruction manual" for the architects and engineers.

Programming involves gathering information from intended building occupants and user groups through group and individual interviews. The programmer researches current and projected needs in such areas as information and instructional technology, academic teaching methods, privacy and security. This process results in a comprehensive description of the necessary components of the project.

Programming has a significant impact on the design and construction of a capital improvement project. It is easier to influence a project's outcome during the early stages than it is to affect the outcome as the project moves forward.

Purpose

The goals of programming are to:

- Finalize the project objectives.
- Determine building and user requirements.
- Establish a total building area.
- Balance and align the scope of work with the project budget.

Using a defined program, it is possible to estimate a realistic project cost, to which yearly escalation factors may be added to account for the proposed schedule of construction and occupancy.

Final Program Document

The project program, the end result of programming, describes how the finished project will "work"--how it will function for building occupants and how it will meet the project requirements.

The final program document presents final recommendations in a clear and succinct manner. It addresses the following key topics:

- Strategic and master planning requirements, consistent with the University's master plan
- Space and functional relationships
- Site location and utility considerations
- Total project cost
- Design expertise required by the project design team
- Concerns, if any, identified about the project scope, schedule, risks and plan of execution

Programming Guidelines

Use these guidelines as a tool to prepare the project program. The guidelines are generic in nature and are suitable for use for all University capital projects.

Table of Contents

Organize the final program document in the following order:

1. Executive Summary

Provide a summary of the project scope, budget, and schedule. Include a synopsis of the major points in the program document.

Address the following topics in the executive summary:

- Project Name
- University Mission Statement
- Departmental Mission Statement
- Include acknowledgments of those who participated in creating the program:
    - Executive Steering Committee Members
    - User Groups
    - Facilities Operations and Maintenance
    - Any other participants
- Project Description and Scope Narrative
- Project Justification
- Project Vision and Goals
    - Describe why the project is necessary for the department(s) and College.
    - Affirm that the project aligns with the stated direction and strategic plan of the University.

  Include the following topics:
    - Explain how the project complies with or will enhance the stated mission and vision of the University and the College/department.
    - Explain how the project will support the academic direction of the institution and the overall need of the project for the next five years.
    - Demonstrate how the project complies with or enhances the campus master plan.
    - Describe the main objectives for the project.

Example (Project Vision + Goals)

PROJECT VISION + GOALS

The committee defined the following vision and goals for the project:

Build an innovative and entrepreneurial culture of learning at the center of campus

- Create a university-wide resource for students of all disciplines to connect to their academic interests—beyond coursework—with external pursuits that create business ideas or impactful community engagement
- Emphasize experiential learning opportunities for students
- Create a space for collisions, engagement, and the development of new ideas
- Create a facility where students can define, develop, and build *proof of concept* projects whether an object or a service

Privilege community engagement and external stakeholder access to innovative and entrepreneurial students

- Establish a new culture of research that emphasizes community engagement and economic impact
- Create a *showcase* with demonstration and display space that illustrates the connection between University research, industry, and the community
- Provide a platform for *theme* and *project driven* opportunities using experiential learning to incorporate multiple disciplines

Design a forward looking, flexible facility with the ability to evolve

- Create physical and visual connectivity throughout the building to drive collaboration across disciplines
- Highlight attractors—people, space, resources, and projects
- Integrate multipurpose classrooms and networking spaces to support meetings, events, and co-working
- Integrate spaces for visualization and virtual connectivity
- Create a welcoming space where individuals do not have to classify themselves as innovators to participate
- Challenge the building to be forward looking and anticipate innovation
- Incorporate sustainable building design to model principles of environmental responsibility and innovative, integrated design
- Achieve LEED Silver—or better—building certification

**Project Vision & Goals – Innovation Hub Program Excerpt*

2. Design Parameters

Describe the design objectives for the project and any design constraints.

Identify the building codes, regulations and *University Design Guidelines* that will directly influence the design and construction of the proposed facility.

Note that the State Fire Marshal is the authority having jurisdiction (AHJ) for all issues pertaining to NFPA 101 Life Safety Codes. The University Fire Marshal is part of the State office.

Include the following references for code compliance:

- National Fire Protection Association - NFPA 101
- International Building Code (IBC)—most recent editions adopted by the City of Houston
- Texas Accessibility Standards (TAS)
- FEMA Flood Mapping

Note the requirement to follow the published University Design Guidelines. These include:

- Project reviews
- Architecture, site and landscape, exterior lighting, and other topics
- Sustainable design
- Furnishings, both exterior and interior
- Signage standards, including donor recognition requirements

State the requirement to adhere to the *University Master Specifications* for design and construction of UH System projects.

Note the requirement to design and certify the project to LEED Silver (or better) Certification.

Donor Recognition Signage

- Engage Advancement as campus partners to discuss the project
- Identify and document donor opportunities. Include in final program

3. Site Development

Provide an analysis of the proposed site or sites for the project.

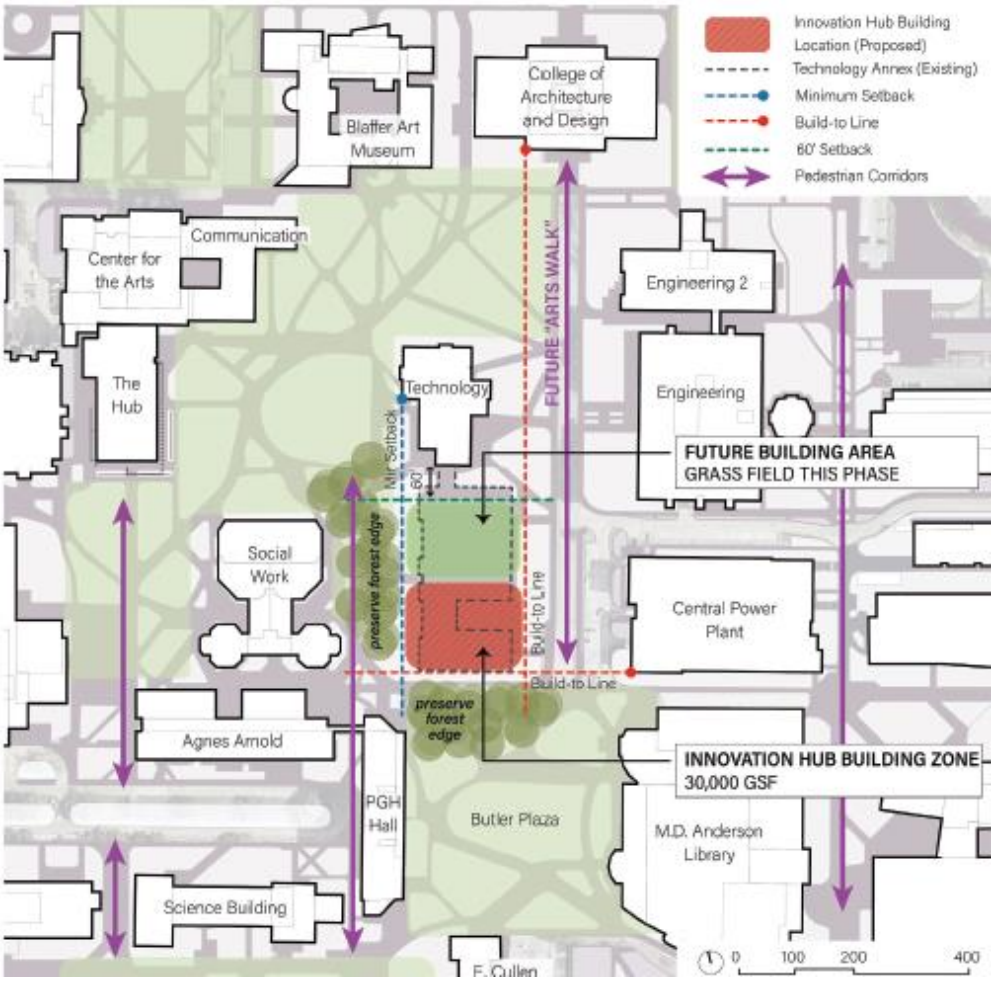
Identify the factors or site drivers that will affect the design of the facility.

Prepare the site analysis in collaboration with the University Architect and Director of Engineering Services.

Use illustrations with narrative to address the following topics:

- Site Introduction
- Site Location and Orientation (including climate, prevailing winds and solar angles)
    - Illustrate how the project and its site reinforce the University Master Plan
    - Identify potential synergies with neighboring buildings and open space
- Site Constraints and Opportunities
    - Visual connections
    - Primary entries
    - Site boundaries, setbacks, build-to lines
    - Location of any easements or setbacks
- Site Circulation/Connectivity
    - Pedestrian access
    - Vehicular access and parking
    - Service access
    - Emergency vehicle access
- Site Utilities
    - Locations, Tie-in Information & Related Infrastructure Improvements
- Storm Water Management
- Landscape Overview
- Parking – Impacts to Existing Parking or Project Special Needs
- Building Massing
- Other
    - Alternative site studies, if required
    - Description of any known environmental issues that would limit use of the site or necessitate additional project costs such as hazardous waste cleanup
    - Diagram showing intended expansion during future phases, if planned
    - Any other significant site influences

Example (Site Development)



**Site Location/Constraints - Innovation Hub Program Excerpt*

4. Space and Adjacency Requirements

Use this section to explain the space requirements and desired functional relationships of the program.

Include an overview or summary description of the proposed facility.

Describe and quantify the facility in physical terms, including:

- Building Summary Space List
    - Include an overall summary list, by space type, of the space requirements for the project
    - Show the total assignable and total gross square footage and the target efficiency
    - Identify any specific requirements associated with non-assignable spaces (e.g., extra wide corridors or impromptu gathering spaces)
    - Total Assignable and Gross Square Footage with Efficiency Factor Noted
- THECB Efficiency and Space Inventory Code Requirements (Only Required for E&G Space)
- University Required Space – Refer to UH Design Guidelines
- Auxiliary Services Space Approval Required, if Applicable
- Adjacency Diagrams
    - Shows relationships between specific rooms and spaces
- Building Stacking Diagrams
- Room Data Sheets
    - Calls out specific requirements for each space
- Test Fits for Non-typical or Specialty Spaces
    - Demonstrate typical layouts for a given program square footage
- Additional Space Requirements – Advancement, Facilities Services, Fire Marshall, Parking & Transportation, if applicable

Texas Higher Education Coordinating Board (THECB) Requirements (E&G Space Only)

Adhere to the following definitions to comply with THECB space calculation and reporting requirements:

- **Gross Square Feet (GSF**) – The sum of all enclosed areas on all floors; areas measured to the exterior surface of building walls, including basements and vertical penetrations. Usable area plus building circulation, mechanical rooms, general restrooms, janitor closets, unassigned storage, exterior walls and structure.

- **Assignable Square Feet (ASF)** – The sum of all areas on all floors of a building that is assigned to or available for assignment to an occupant or other specific program use, for example, classrooms, offices, conference areas and reception. Does not include circulation areas. Measured from the inside face of enclosing partitions or walls.

- **Space Efficiency Factor** – Total or gross building area is calculated using a factor with the assignable area as the base. This ratio is the expression of the assignable areas to the gross building area as a percentage. To calculate gross square feet (GSF), divide the sum of the assignable spaces by the appropriate grossing factor.

Provide the Space Efficiency Factor.

Provide the THECB space code for each program space type. (Required for E&G space only)

Auxiliary Services – Food Service Review

Engage the Department of Auxiliary Services if food or beverage service is desired in the new facility.

Summary Space List

Include an overall summary list, by space type, of the space requirements for the project.

Show the total assignable and total gross square footage and the target efficiency.

Identify any specific requirements associated with non-assignable spaces (e.g., extra wide corridors or impromptu gathering spaces).

Example

Summary Space List

	Program
	Total SF
Residential Community Spaces	
Residential Spaces	98,280
Community Spaces	30,135
Community Support Services	5,900
Building Common Spaces	
Building Commons	3,800
Learning Spaces	2,500
Staff/Administrative	2,665
Staff/ Residences	3,600
Support Services	2,790
SUMMARY	
NSF	149,670
gross ratio factor	0.65
GSF	230,262 *
# Beds:	1,000
GSF / Bed:	230.26
	65.00%

* This is based on 1,000 beds

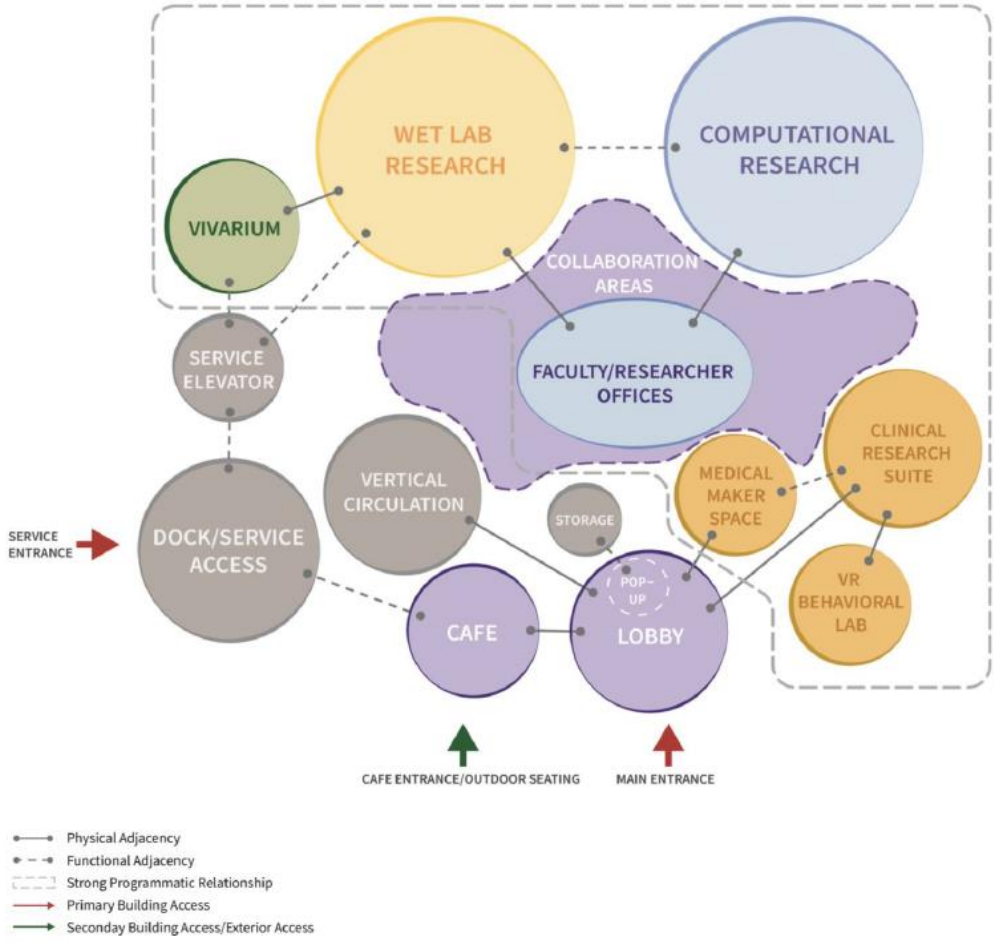
**Summary Space List. First-Year Student Residence Hall Program Excerpt*

Adjacency Diagram

Provide a diagram that illustrates the most important adjacencies for the program spaces. The adjacency diagram imagines all of the spaces as if on a single floor.

Example

Adjacencies



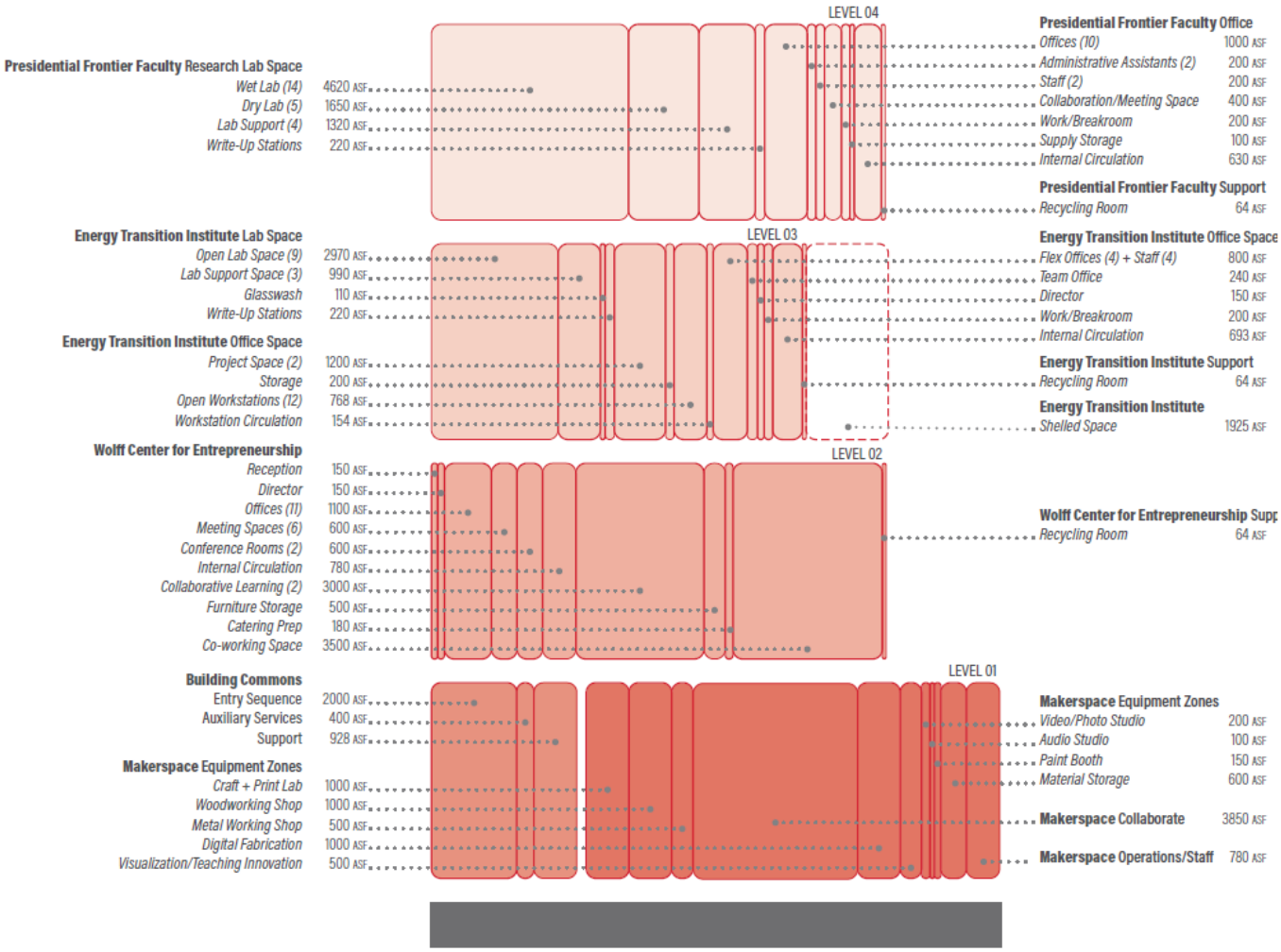
**Adjacency Diagram – College of Medicine Medical Research Building Excerpt*

Building Stacking Diagram

Create a diagram that illustrates conceptually where each department or functional unit is placed, or "stacked," vertically in a multi-story building. The stacking diagram balances many factors, including desired functional adjacencies, space requirements, site constraints and opportunities and campus master plan requirements.

Example

Stacking Diagram



**Stacking Diagram - Innovation Hub Program Excerpt*

Detailed Space Lists

Include detailed lists of program spaces organized by typology.

Label each program space with the appropriate THECB space code.

Example (Instructional Areas)

Detailed Space List

SPACE	№ + SIZE	SF
Large Classroom Pre-function	2 @ 400 asf	800
Dividable Tiered Lecture	1 @ 6,231 asf	6,231
Control Room/AV Support	1 @ 100 asf	100
Furniture Storage	1 @ 400 asf	400
Conf./Robing	1 @ 200 asf	200
Parliament Classroom	2 @ 2,260 asf	4,520
Medium Classroom	4 @ 1,150 asf	4,600
Seminar Room	6 @ 574 asf	3,444
Active Learning Classroom	1 @ 768 asf	768
Advocacy Skills		
Advocacy Skills Lab	4 @ 574 asf	2,296
Support Storage	2 @ 200 asf	400
Interview/Video Review Rooms	8 @ 120 asf	960
TOTAL ASF		24,719

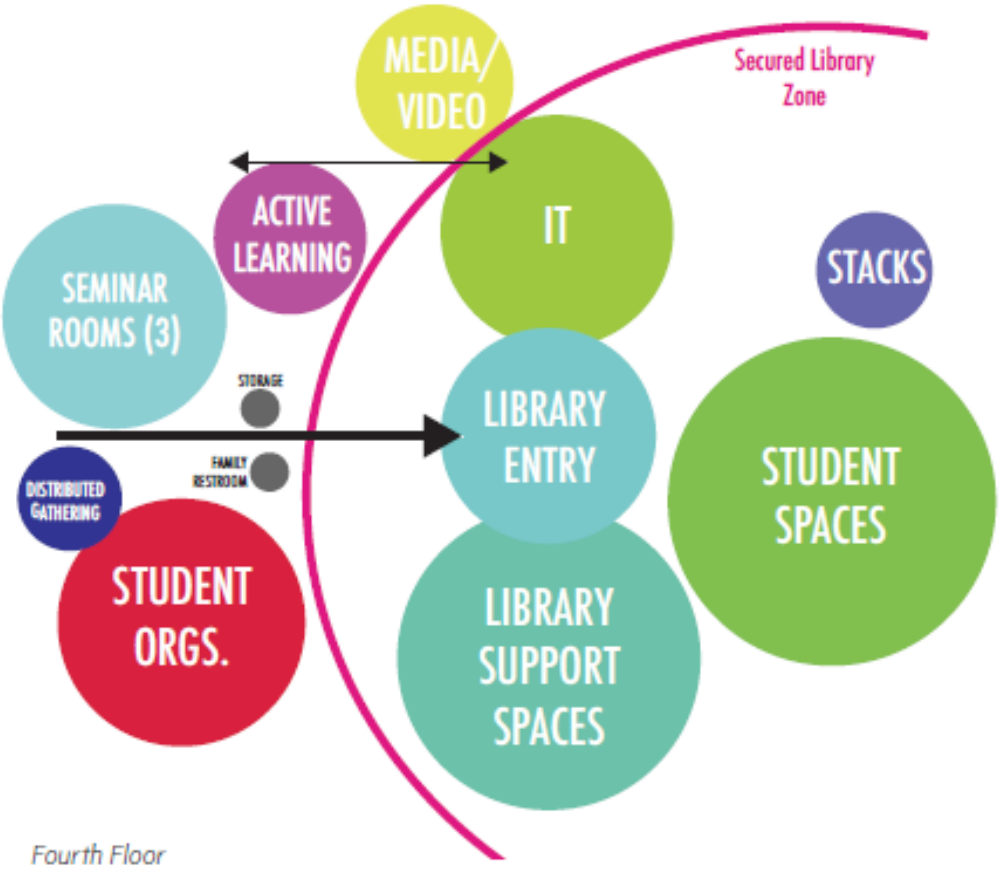
*Detailed Space List – Innovation Hub Program Excerpt

Functional Relationship Diagrams (As Necessary)

Use functional relationship diagrams to illustrate the hierarchy of adjacencies on a floor, within a department or within a grouping of rooms.

Illustrate adjacency requirements clearly so the architect can later convert the diagram into a floor plan that maintains all required relationships.

Example



Room Data Sheets

Provide room data sheets to identify specific requirements for each space type. These may include:

- Desired occupancy
- Finishes
- Special security or access features
- Special mechanical, electrical or plumbing requirements
- Furniture or equipment to be relocated or provided by the Owner
- Specialty furniture or equipment to be purchased and installed by the project

Example

COUNSELING ROOM

Expansion ▹ *VS* ▹ Shared Support

One-on-one counseling space

SPATIAL CHARACTERISTICS

ROOM SIZE	150 ASF
OCCUPANTS	2
WALL FINISH	Painted GWB
FLOOR FINISH	Carpet tiles
CEILING FINISH	Suspended acoustical tile
DOOR SIZE	36 in wide
EXTERIOR ACCESS	–
NATURAL LIGHT	Preferred

ELECTRICAL • IT • AUDIOVISUAL

POWER	Standard 120-volt[1]
DATA	Ethernet + wireless[1]
TELEPHONE	VOIP[1]
AUDIOVISUAL	–
SECURITY	Standard door lock; panic button[2]
LIGHTING	LED[3]

FURNISHINGS • FIXTURES • EQUIPMENT

Writable surface(s)	OFOI
Table and chairs	OFOI
Computer station (for tele-health sessions)	OFOI
Telephone	OFOI

NOTES

1 Provide electrical receptacles and ethernet ports along the perimeter walls for convenience and to support a computer workstation

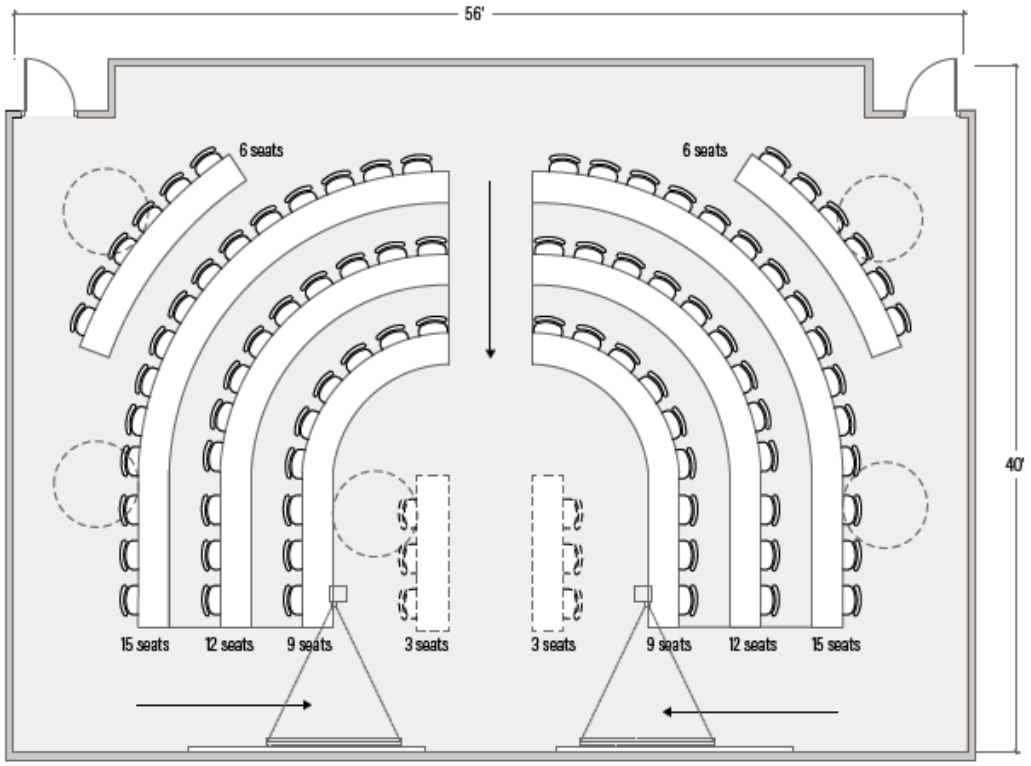
2 Room requires visual access from circulation via a window or side lite

3 Provide non-glare, direct/indirect lighting; utilize task lighting as required

Test Fit Plans

Include illustrative plans or “test fits” for specialty spaces to demonstrate that stated needs and requirements can be accommodated within the proposed program square footage.

Example



5. Preliminary Cost Estimate Summary

Include an opinion of probable construction costs completed by an independent third-party cost estimator. Detailed cost estimate to be included in the appendix.

Include the following in the project cost estimate summary:

- Opinion of probable construction costs
- Annual construction escalation to (month/year)
- Contractor contingency, overhead and profit

  Sub-Total, Construction Cost—Construction Cost Limit (CCL)

- Soft Costs Provided by UH FP&C
- Furniture budget (developed with FP&C, using UH furniture standards and historical cost information)

  Sub-Total, Soft and FF&E Costs

- **Total Project Cost (TPC)**

6. Variance Management

- Proposed variances, if any, identified and submitted

7. Appendices

- Detailed Cost Estimate in CSI Divisions
- Conceptual Renderings
- Alternate Studies (When Applicable)
- Benchmarking (When Applicable)
- Lessons Learned (When Applicable)
- Phasing Considerations (When Applicable)
- Meeting Minutes (When Applicable)