



PLANNING METHODOLOGY: BUBBLE DIAGRAMS AND BLOCK PLANS & CRITERIA MATRIX

Dr. Omar A. Khalaf

SPACE PLANNING AND THE HUMAN EXPERIENCE
INDS 408

Fall Semester

Week number Three

18/10/2023

OUTLINE

- **PLANNING METHODOLOGY**
- **CRITERIA MATRIX**
- **BUBBLE DIAGRAMS**
- **SMALL AND DIMENSIONALLY DEMANDING SPACES**

Objectives

- To define Planning Methodology.
- To know how to design the space program .
- To understand the all means of planning relationship diagrams.

PLANNING METHODOLOGY

Design methodology:

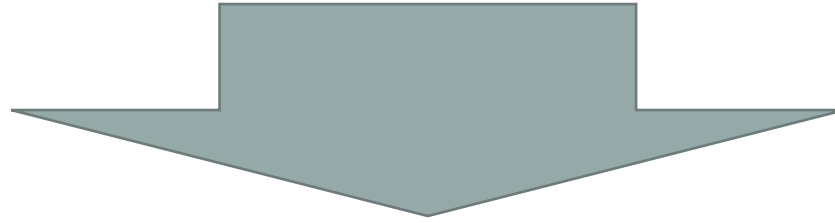
is a structured process that outlines the parameters of generally accepted sequences of tasks that occur from the point at which a designer or space planner begins to work on a project to the point at which the project is complete and occupied.



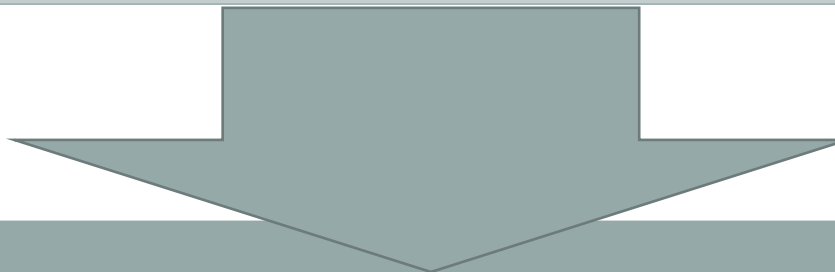
the design methodology process has remained intact, consisting essentially of seven sequential steps. These are:

1. Programming
2. Schematic design
3. Design development
4. Construction documents
5. Bidding (tendering) of construction documents.
6. Execution/supervision of project.
7. Post-occupancy evaluation.





- The title of this chapter, “**Planning Methodology**,” is a phrase used throughout this text to describe the phase of the space planning process that begins when the planning problem is presented to you (with or without a program) and ends when physical planning commences, usually with bubble diagrams or block plans. In some professional circles, this is called the pre-design process—meaning all the necessary steps of data gathering, research, analysis, and interpretation before actual planning.
- For many in the design fields, “**planning methodology**” and “**programming**” are **synonymous**, although some would argue that the charting and diagramming described here as part of planning methodology fall outside the bounds of programming and are part of the design process.



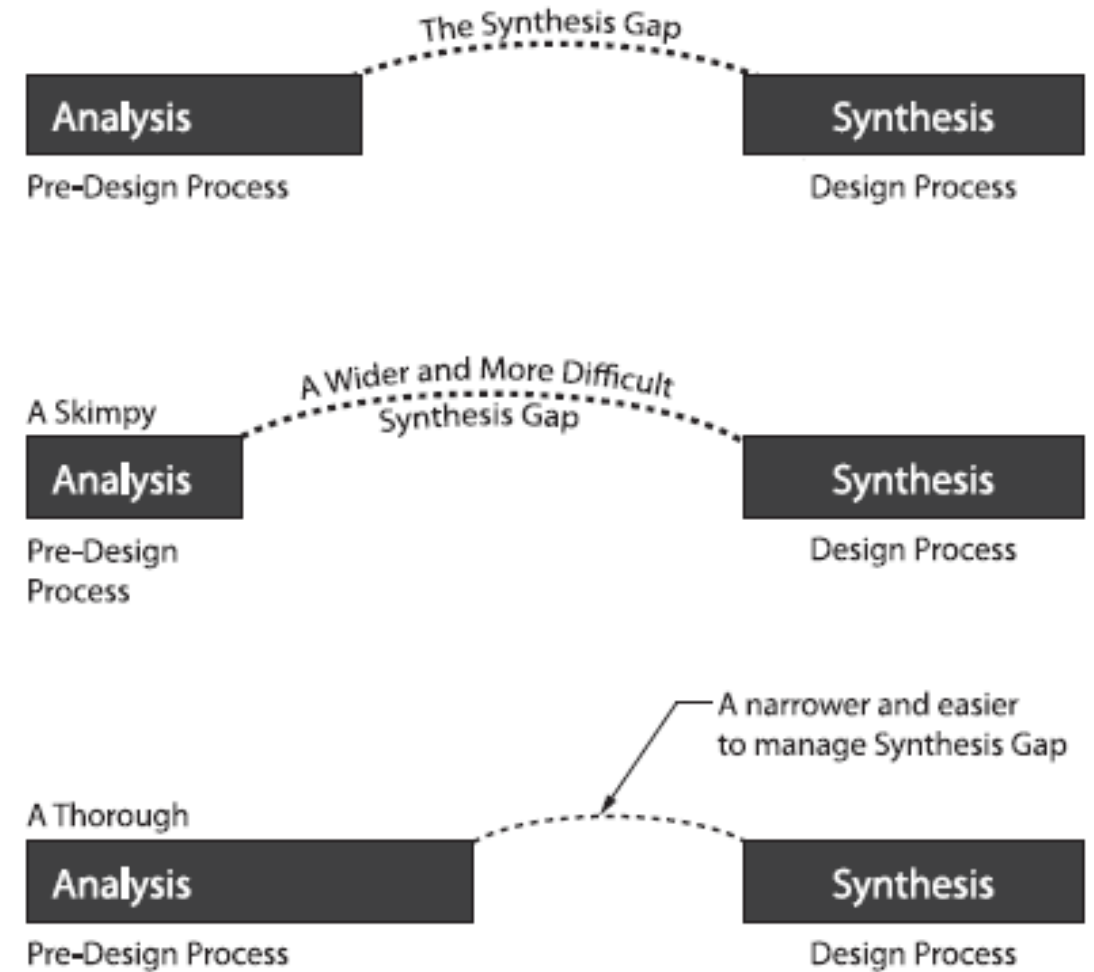
The Synthesis Gap

Among professionals working in the field, a generally accepted process or sequence of tasks occurs from the point at which the planner begins to work on a project to the point at which project analysis is complete and the physical planning process begins.



1. Interview
 - a. Executive level (organizational overview)
 - b. Managerial level (departmental function)
 - c. Operations level (process and equipment detail)
2. Observe (existing or similar facilities)
 - a. Assisted observation
 - b. Unobtrusive observation
 - c. Inventory of existing furniture and equipment (when it is to be reused)
3. Establish architectural parameters
 - a. Acquire complete base plan data (including mechanical and electrical services)
 - b. Compile contextual data (architectural, historical, social)
 - c. Research environmental and code constraints
 - d. Complete basic site inventory (sun angles, breeze directions, and rainfall amounts)
4. Organize collected data (the first-phase program)
 - a. Place data in sequential format most useful for planning
 - b. Summarize confirmed quantitative factors (square footage, FF+E (furniture, fixtures and equipment) count, equipment sizes, etc.)
 - c. Record first thoughts on conceptual planning approach
5. Research the unknowns
 - a. Gather detailed information on process and equipment
 - b. Gather case study information on similar facilities
 - c. Integrate researched data with first-phase program

- 
6. Analyze the data
 - a. Discover planning affinities (working interrelationships, public/private zoning, special acoustic needs, etc.)
 - b. Discover scheduling affinities (maximize use of space)
 - c. Identify planning or architectural relationships (site, environmental, structural, mechanical, sustainability, and electrical conditions)
 7. Interpret and diagram the data (the complete program)
 - a. Define the functional problems in planning terms
 - b. Establish a basic conceptual approach (in terms of human/social image/esthetic, and sustainability goals)
 - c. Prepare relationship or adjacency diagrams (for client and designer visualization)
 8. Summarize the data (the finished document)
 - a. Finalize project concepts—*state the problem*
 - b. Outline and tally basic budget issues
 - c. Prepare a package for client approval to serve as the designer's manual for space planning
- 



Illus. 1-1 Synthesis gap

The Design Program (CREATING THE BRIEF /OR/ PROGRAM)

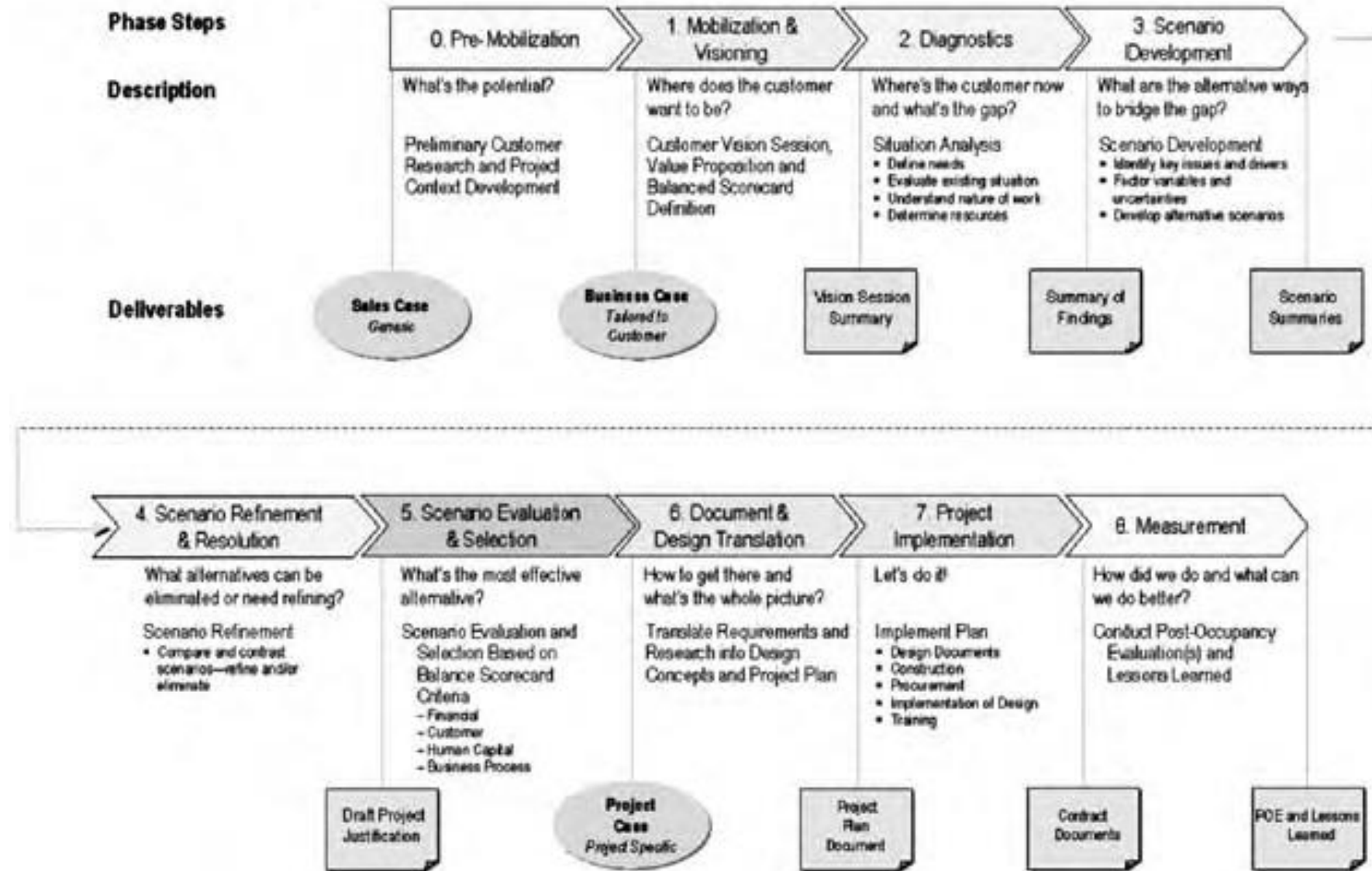
- In space planning terms, design programs are written documents that qualify and quantify the clients' or the users' needs for a given project.
- BRIEF : according to the AIA/ASID Standard Form of Agreement for Interior Design Services does. Writing a brief or program, sometimes referred to as a project analysis report, project manual, or developmental planning report, defines the direction and basis of the proposed project.

Programming is a systematic approach to gathering information regarding goals, strategies, priorities, and existing problems within the organization, and then analyzing and interpreting this data to determine and define the client's goals, requirements, and objectives.

Preliminary goals, priorities, and strategies will often require revisions after the data is analyzed.

The final statement, which usually takes the form of a written document, creates the basis upon which the space planner can formulate a concept for the project, as well as a benchmark for both the decision making process and the evaluation of final solutions.

Planning Process Example



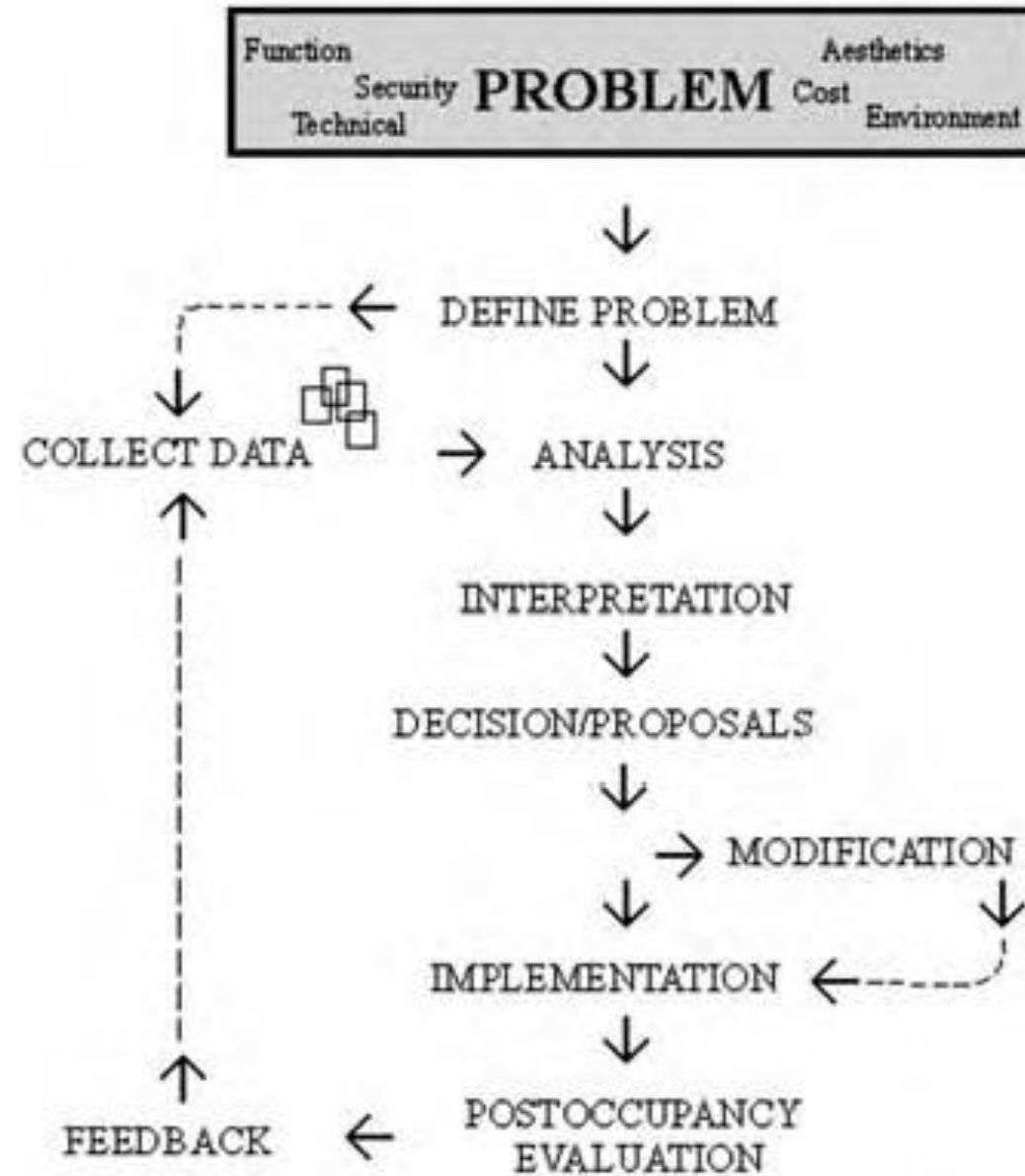
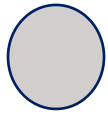
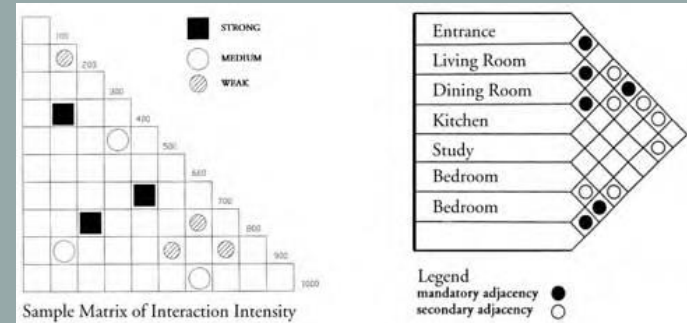


FIGURE 2.1a The design methodology process and data analysis.



CRITERIA MATRIX

- In this context, the word “**criteria**” refers to the program requirements,
- and the word “**matrix**” is best defined as a “**rectangular arrangement of elements into rows and columns.**”
- The **criteria matrix** attempts to verbally and visually organize design program requirements in as concise a form as possible, achieving an overview of the problem in an at-a-glance format.
- The **matrix format** is a widely used technique for visually organizing information of a variety of factors; this format is sometimes referred to as a “chart” or “table.”
- It is applicable to both small and large projects and is adaptable to either tight or open time frames or deadlines.



CRITERIA MATRIX FOR:	SQ	FOOTAGE	NEEDS	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT AND/OR VIEW	PRIVACY	PLUMBING	SPECIAL EQUIPMENT	SPECIAL CONSIDERATION	
① RECEPTION	250	②	H	Y	N	N	N			TRAFFIC JIBS NOT TO WASH ENTRANCE	
② INTERVIEW STA.	220	③	M	I	L	N	N			FUEL GAS A TEAM OF FOUR	
③ DIRECTOR (4)	140	④	M	Y	H	N	N			HIGHEST IMAGE ACCESS TO HEAD DR FOR PRIVATE EXIT	
④ STAFF	180	⑤	M	Y	M	N	N				
⑤ SEMINAR RM	300	⑥	H	I	H	N	Y			A/V USE IMPORTANT CLOSE TO ENTRANCE	
⑥ REST ROOM (2)	200	CENTRAL	M	N	H	Y	N				
⑦ WORK AREA	120	⑧	L	N	M	Y	Y				
⑧ COFFEE STATION	50	CENTRAL	H	Y	N	Y	Y			CONVENIENT FOR EVERYONE	
⑨ GUEST APARTMENT	350	RENOV	L	Y	H	Y	N			RESIDENTIAL CHARACTER	
TOTAL NEEDED = 1810 S.F. 2500 S.F. - 650 S.F. = 1810 S.F.		TOTAL AVAILABLE = 2500 S.F. LESS 25% FOR CIRCULATION = 825 S.F.									

LEGEND:
 H=HIGH
 M=MEDIUM
 L=LOW
 Y=YES
 N=NO/NOT
 I=IMPORTANT BUT NOT REQUIRED
 I=IMPORTANT BUT NOT REQUIRED
 ○=IMPORTANT ADJACENT
 ●=REASONABLY CONVENIENT
 ●=UNIMPORTANT
 ○=REMOVE

Departmental and interdepartmental communication: the primary focus is to establish spatial relationships or adjacency requirements between the various elements to determine placement in the space

CRITERIA MATRIX		UNIVERSITY CAREER COUNSELING CENTER								
		SQ. FOOTAGE	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT	PRIVACY	PLUMBING	SPECIAL EQUIPMENT	SPECIAL CONSIDERATIONS	SUSTAINABLE FACTORS
①	RECEPTION	② ⑤	H	Y	N	N	N	TRAFFIC HUB ADJ. TO ENTRY		LT. COLOR SURFACES REFLECT DAYLIGHT
②	INTERVIEW	① ④	M	I	L	N	N	FEEL LIKE A TEAM OF 9		LT. COLOR SURFACES REFLECT DAYLIGHT
③	DIRECTOR	④	M	Y	H	N	N	HIGHEST IMAGE PRIVATE/REAR EXIT		
④	STAFF	③	M	Y	M	N	N			
⑤	SEMINAR	① ⑥ ⑦	H	I	H	N	Y	AV USE CLOSE TO ENTRY		DIMMABLE LED LTG.
⑥	RESTROOMS	CENTRAL	M	N	H	Y	N			LOW FLOW PLUMB'G MOTION SENSORS
⑦	WORK AREA	② ④ CENTRAL	L	N	M	Y	Y	ADD PLANTS TO CLEAN AIR		
⑧	COFFEE	CENTRAL	H	Y	N	Y	Y	CONVENIENT FOR EVERYONE		RECYCLING BIN
⑨	GUEST SUITE	REMOTE	L	Y	H	Y	N	RESIDENTIAL CHARACTER		ENERGY STAR REFRIGERATOR
⑩	MECHANICAL	REMOTE	N	Y	Y	Y	Y			SOUND ATTENUATION

LEGEND:

H = HIGH

M = MEDIUM

L = LOW

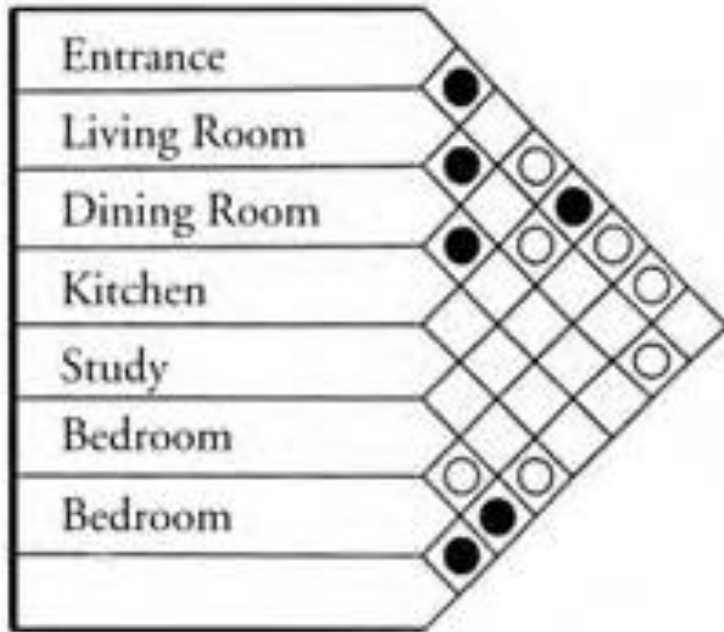
Y = YES

N = NO/NONE

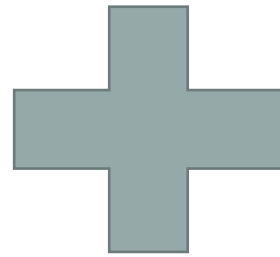
I = IMPORTANT

BUT

NOT REQUIRED



Legend
 mandatory adjacency ●
 secondary adjacency ○



CRITERIA MATRIX		SQ. FOOTAGE	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT	PRIVACY	PLUMBING	SPECIAL EQUIPMENT	SPECIAL CONSIDERATIONS	SUSTAINABLE FACTORS
UNIVERSITY CAREER COUNSELING CENTER										
①	RECEPTION									
②	INTERVIEW									
③	DIRECTOR									
④	STAFF									
⑤	SEMINAR									
⑥	RESTROOMS									
⑦	WORK AREA									
⑧	COFFEE									
⑨	GUEST SUITE									
⑩	MECHANICAL									



COMPLETED CRITERIA MATRIX WITH ADDED ADJACENCY MATRIX
DESIGN PROGRAM 2S

CRITERIA MATRIX FOR: UNIVERSITY CAREER COUNSELING CENTER		SQ. FOOTAGE NEEDS	ADJACENCIES	PUBLIC ACCESS	DAYLIGHT AND/OR VIEWS	PRIVACY	PLUMBING	SPECIAL EQUIPMENT	SPECIAL CONSIDERATIONS	SUSTAINABLE FACTORS
①	RECEPTION	330	② ⑤	H	Y	N	N	N	TRAFFIC HUB ADJ. TO MAIN ENTRANCE	USE LIGHT COLORED SURFACES TO REFLECT DAYLIGHT
②	INTERVIEW ST. (9)	600	① ④	M	I	L	N	N	FEEL LIKE A TEAM OF NINE	USE LIGHT COLORED SURFACES TO REFLECT DAYLIGHT
③	DIRECTOR	110	④	M	Y	H	N	N	HIGHEST IMAGE ACCESS TO REAR OR FOR PRIVATE EXIT	
④	STAFF	160	③	M	Y	M	N	N		
⑤	SEMINAR RM.	330	① ⑥ ⑦	H	I	H	N	Y	A/V USE IMPORTANT CLOSE TO ENTRANCE	DIMMABLE LED LIGHTING
⑥	RESTROOM (2)	210	↑ CENTRAL ↓	M	N	H	Y	N		LOW FLOW FIXTURES MOTION SENSORS FOR LIGHTS
⑦	WORK AREA	120	② ④ CENTRAL	L	N	M	Y	Y		ADD PLANTS TO HELP CLEAN THE INDOOR AIR
⑧	COFFEE STATION	30	CENTRAL	H	Y	N	Y	Y	CONVENIENT FOR EVERYONE	ADD RECYCLING BIN
⑨	GUEST SUITE	300	REMOTE	L	Y	H	Y	N	RESIDENTIAL CHARACTER	ENERGY STAR REFRIGERATOR
⑩	MECHANICAL EQUIPMENT	180	REMOTE	N	Y	Y	Y	Y		SOUND ATTENUATION

TOTAL NEEDED	- 2370 S.F.	TOTAL AVAILABLE	- 3250 S.F.
3250 S.F. - 815 S.F.	- 3435 S.F.	LESS 25% FOR CIRCULATION	- 815 S.F.

LEGEND:
H - HIGH
M - MEDIUM
L - LOW
Y - YES
N - NO/NONE
I - IMPORTANT BUT NOT REQUIRED
⊗ - IMMEDIATELY ADJACENT
* - IMPORTANT ADJACENCY
+ - REASONABLY CONVENIENT
- - REMOTE

Illus. 1-12 Criteria matrix with square feet and adjacency.



BUBBLE DIAGRAMS

➤ Relationship Diagrams

The relationship diagram is an excellent transition between the essentially verbal analysis of program development and the completely graphic techniques used in physically planning a space.

The relationship diagram is part of the pre-design process, because it represents a graphic abstraction or interpretation of the program information rather than a planning solution.



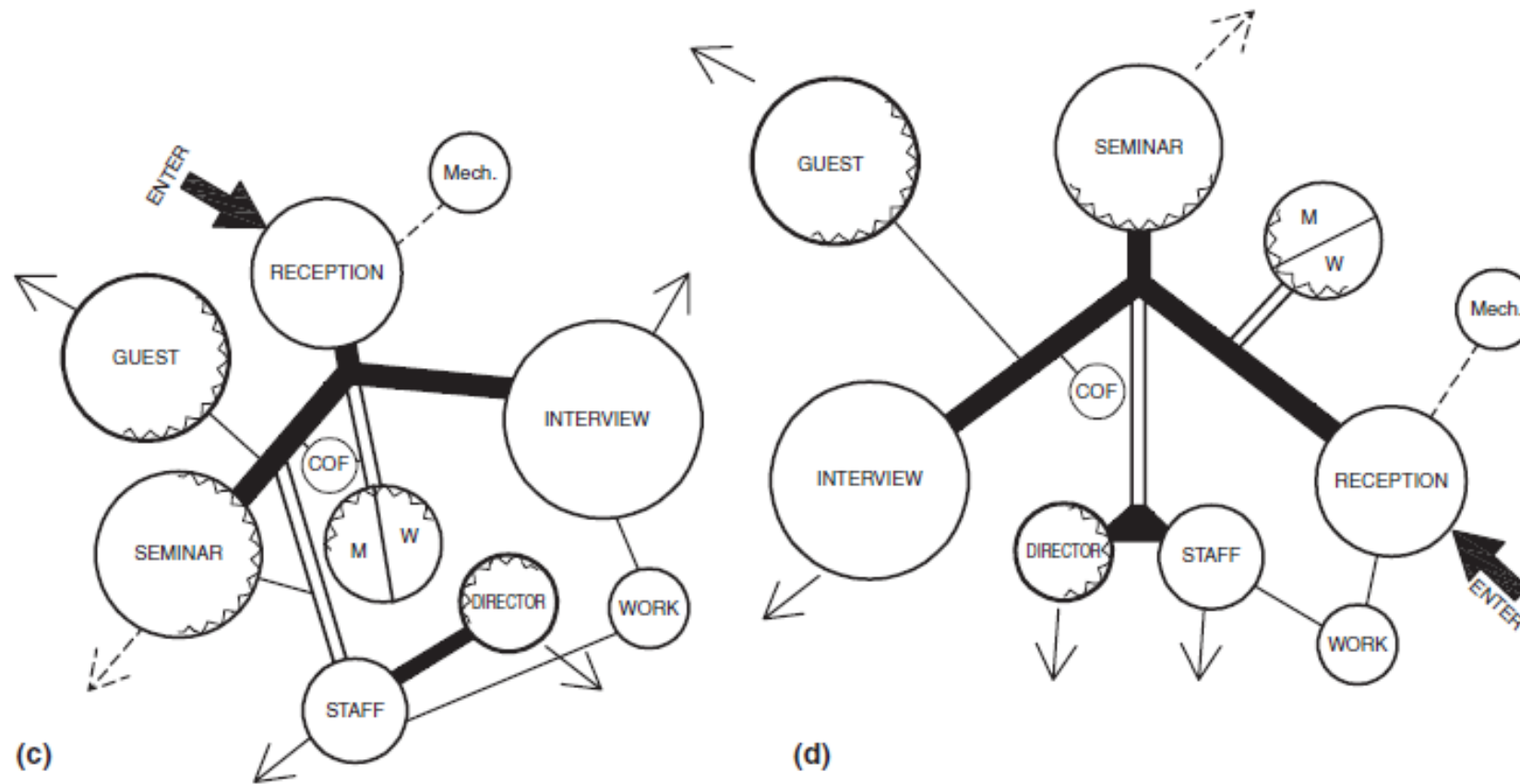
How to start??

- With the criteria matrix just completed and the required rooms and spaces fresh in your mind, draw a circle for each required space so that its position on the paper represents a correct or appropriate relationship to the other spaces.
- Use connecting lines between the circles to indicate travel or circulation patterns between spaces; those connections should be coded by using heavy or multiple lines for important or heavily traveled connections and lighter connecting lines between spaces where circulation adjacency is less important or less traveled. as well using colors.
- It is a good idea to have the circles approximately proportional in size; ideally, a circle representing a 300-square-foot conference room should be about three times the area of the circle representing a 100-square-foot office.

Diagram Factors

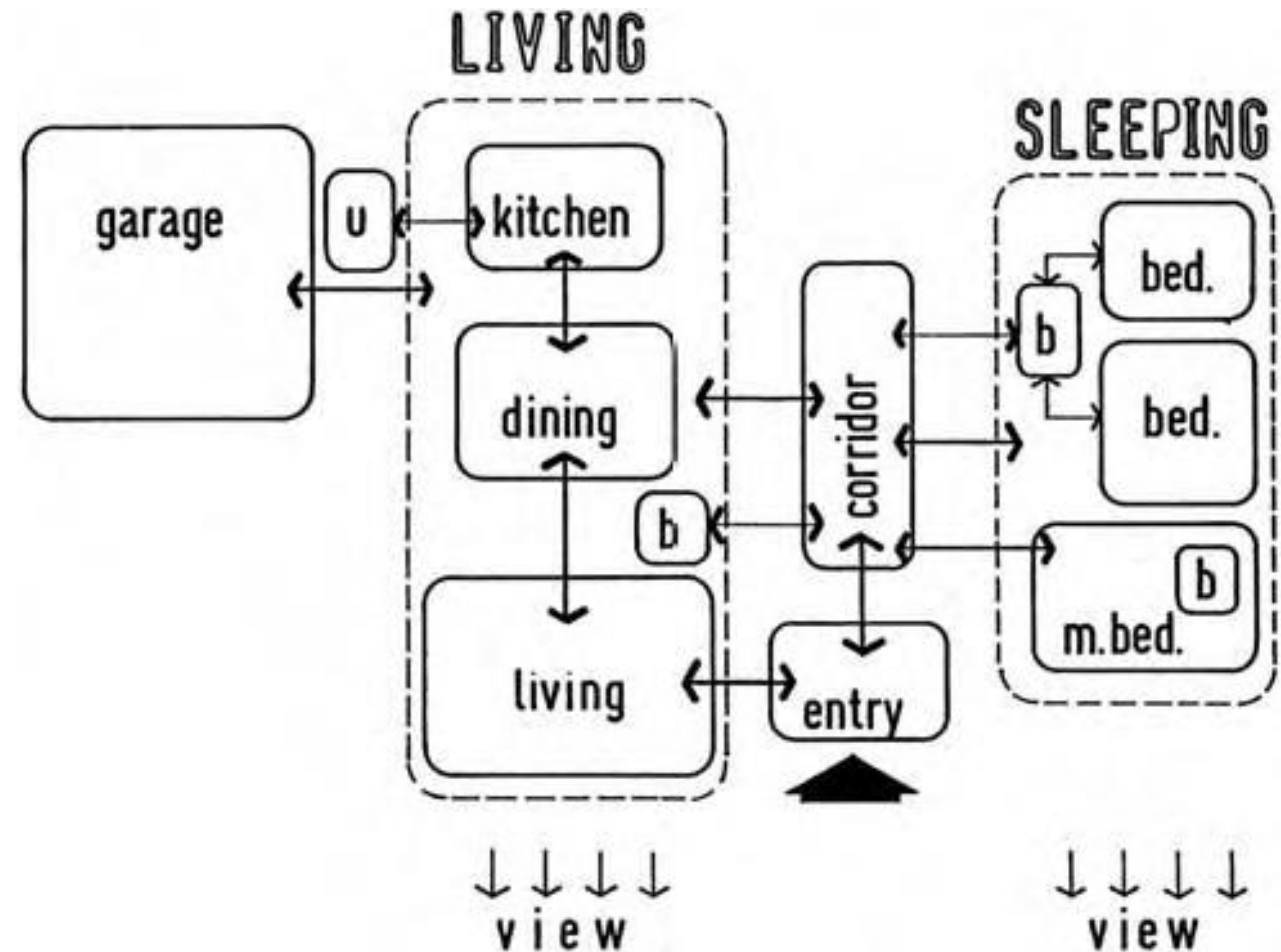
LEGEND	
—	IMMEDIATELY ADJACENT
—	CLOSE + CONVENIENT
—	CONVENIENT
- - - -	MINOR RELATIONSHIP
~~~~~	ACOUSTIC PRIVACY
→	PRIMARY VIEW
- - - ->	SECONDARY VIEW

## RELATIONSHIP DIAGRAMS

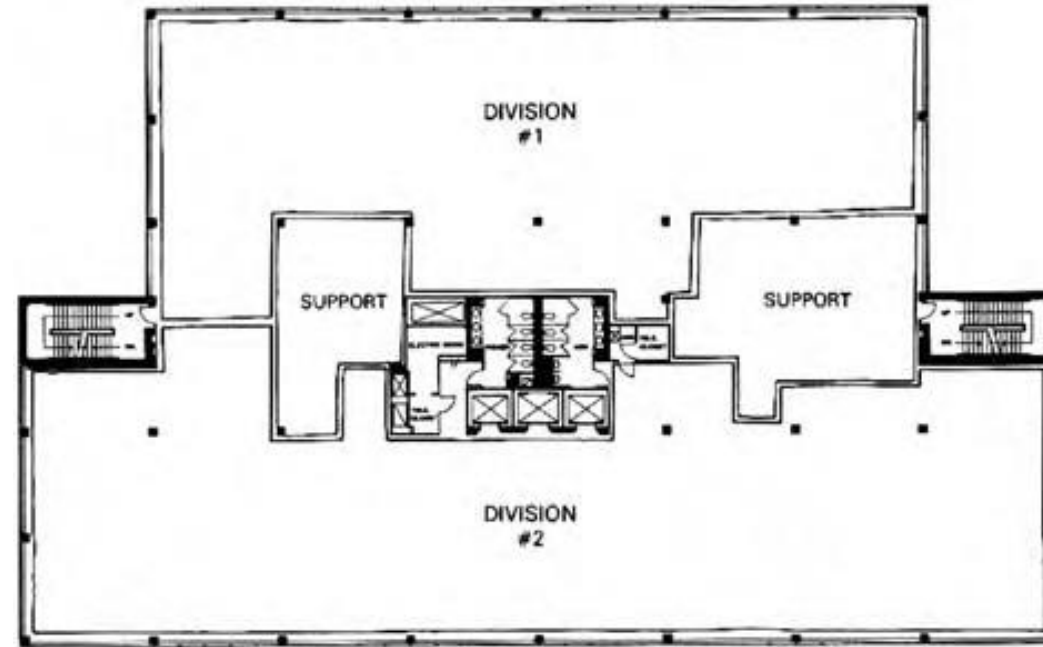


## ➤ Bubble and Blocking/Stacking Diagrams

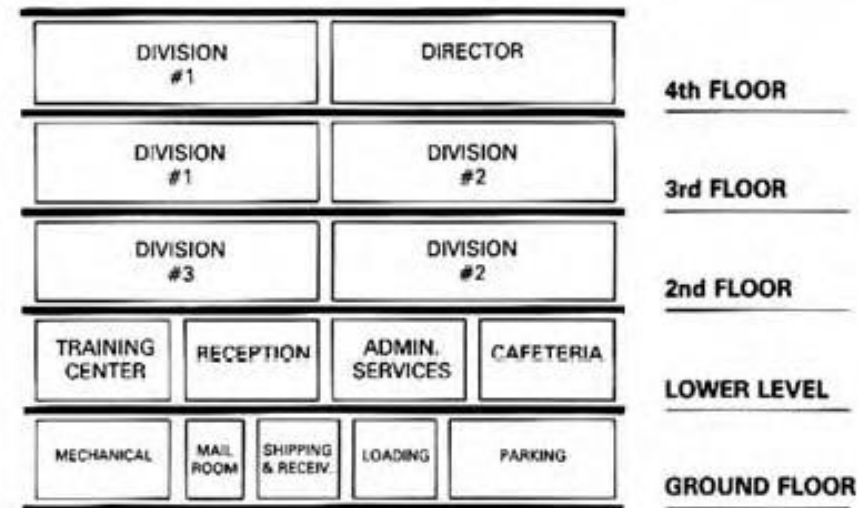
The tools required are simple. Obviously, you need a base floor plan of the building. In addition, you need lots of tracing paper, an architectural scale, and soft or flowing media with which to draw. Most typically, rolls of inexpensive yellow tracing paper (sometimes called “trace,” “yellow trace,” or “bumwad”) are used, although any reasonably transparent tracing paper, yellow or white, can be used. Almost any drawing medium can be used, but markers or colored wax pencils are among the best, since they flow on the paper easily and make a bold mark without effort.

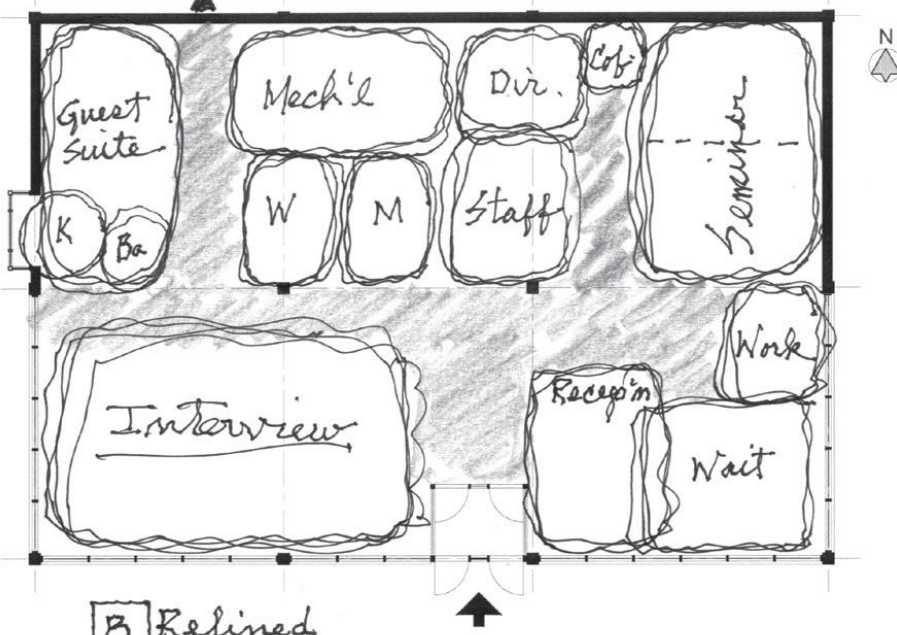
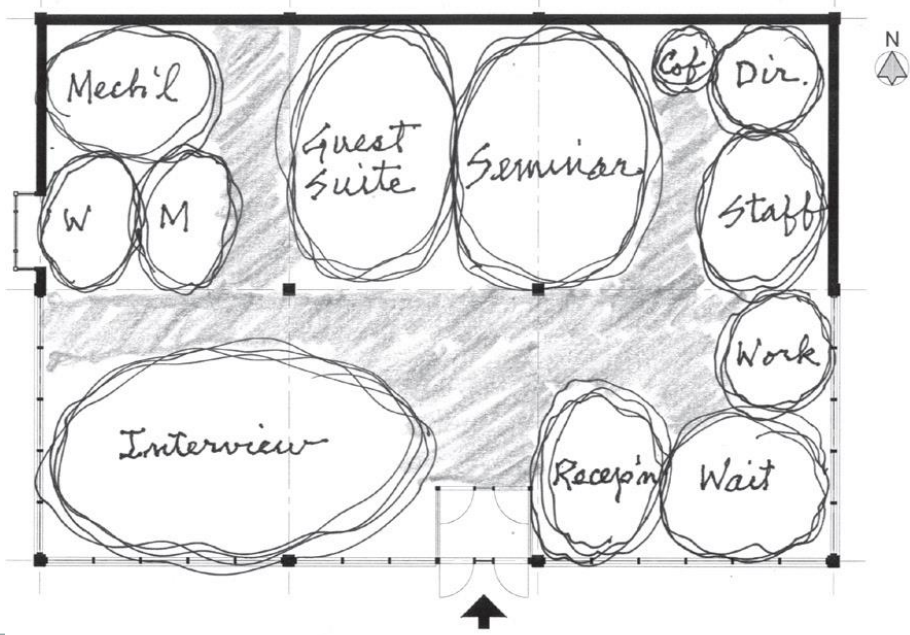
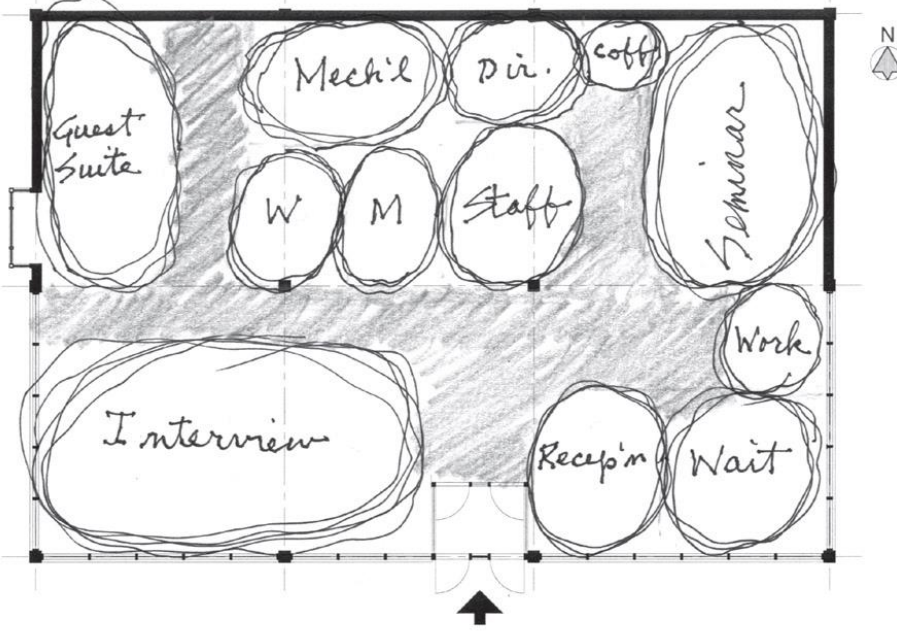
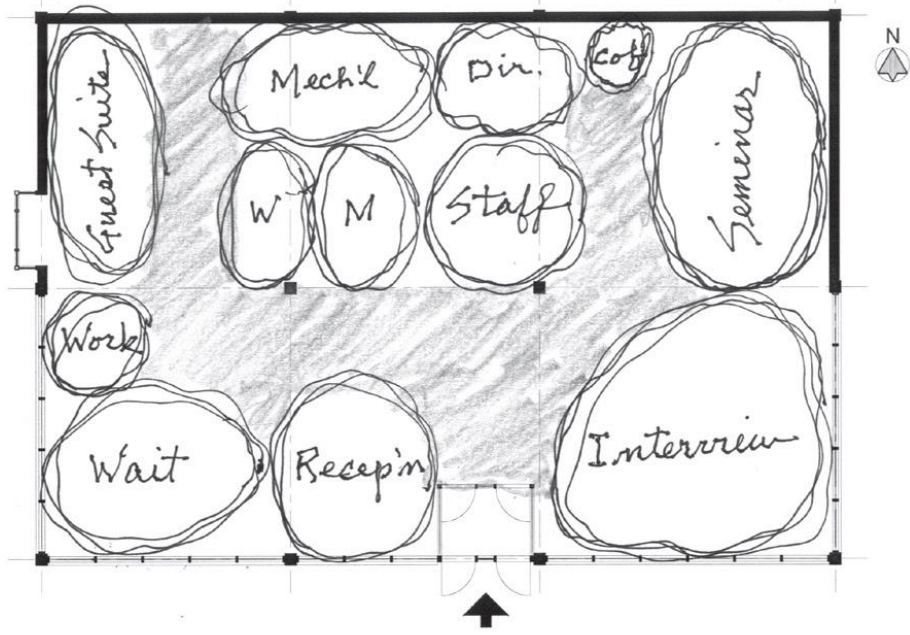


- The schematic space plan takes the bubble and blocking/stacking diagrams to the next level of detail and sophistication.
- When the area assignment is complete, the space planner proceeds to develop a space layout that reflects the program's stated requirements and objectives. Functional elements are located within the space in a format consistent with the program's goals and objectives while retaining the desired adjacencies and functions.



A. Blocking Plan

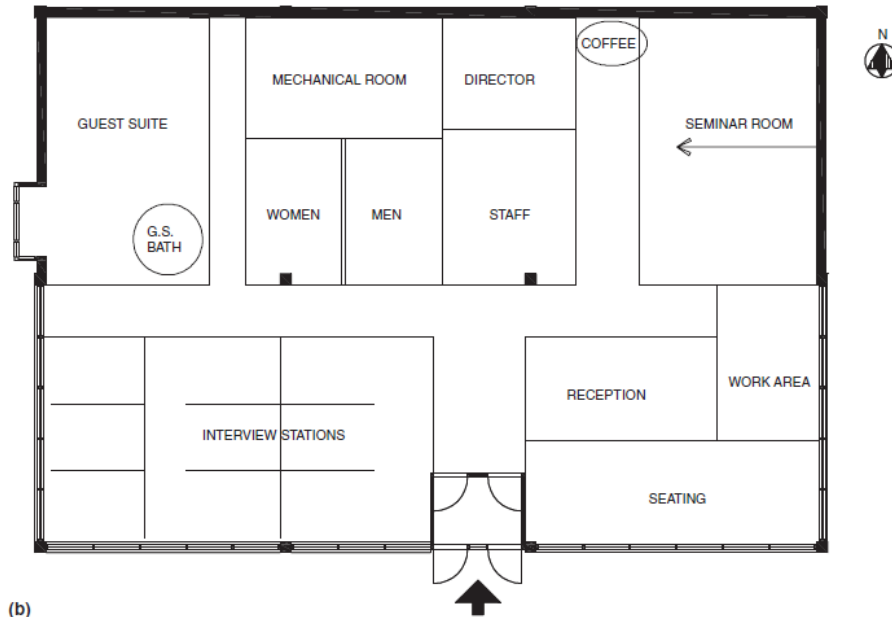
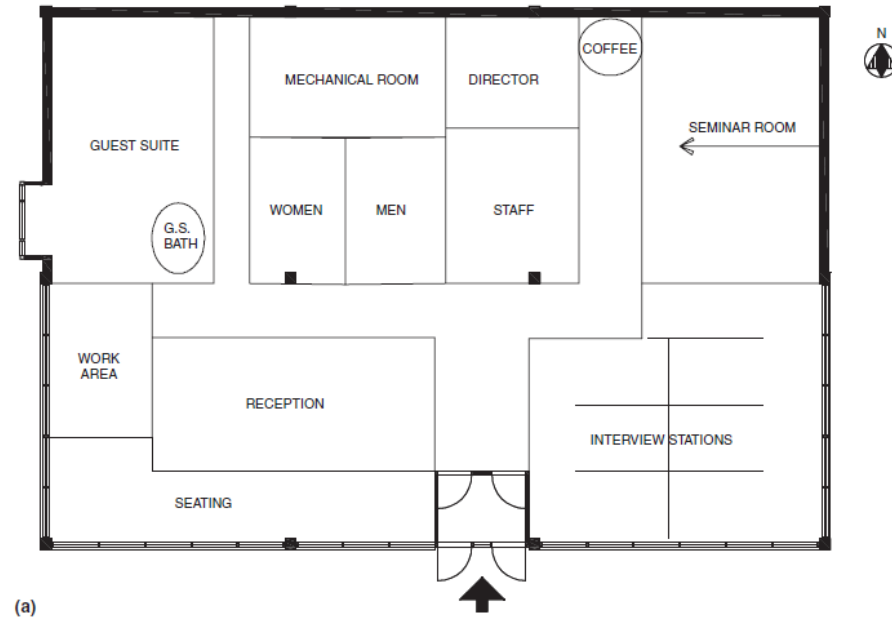
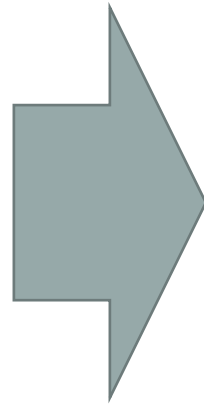




**B** Refined

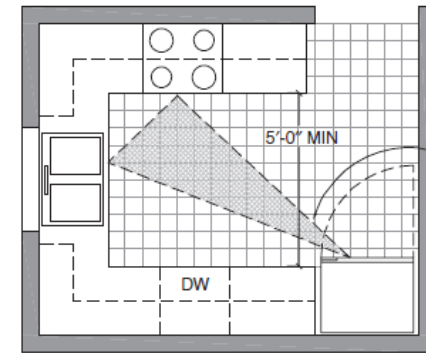
## ➤ Block Planning

- Its use is particularly widespread in large-scale retail and store planning. The process of development and the results are similar to those in bubble diagramming.
- **The primary advantage of block planning over bubble diagramming** is that the result is more like a conventional floor plan, and some planners feel more comfortable working with its more geometric quality.
- **Its primary disadvantage in relation to bubble diagramming** is that it lacks some of the free-flowing spontaneity and intuitiveness inherent in the bubble diagramming process; it also has a tendency to ignore curvilinear and other nonrectangular solutions.

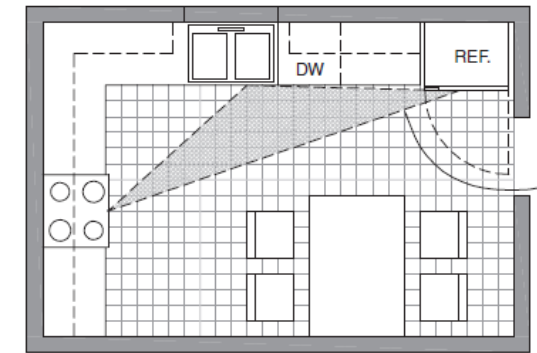


# SMALL AND DIMENSIONALLY DEMANDING SPACES

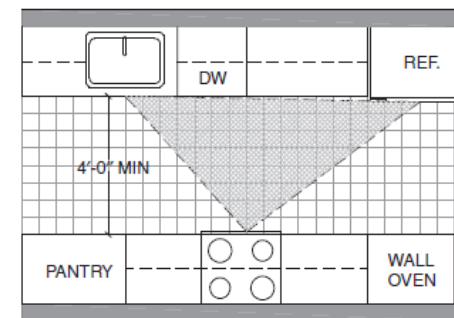
- It is the step before attempting to solve conventional space planning problems, it is important to master the planning of typical small and dimensionally demanding spaces.
- Specifically, first you should be competent in planning typical **residential spaces (kitchens, bathrooms, powder rooms, and laundries)** and typical **nonresidential spaces (public restrooms and small serving kitchens)**. To a lesser degree, you should be familiar with such **nontypical spaces as network server rooms and scientific laboratories**.
- The common denominator for these spaces is that they are equipment-intensive and expensive to construct; hence they are usually planned with an eye to maximum economy and efficiency in their use of space.



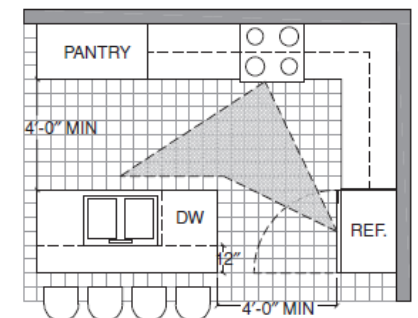
U - SHAPED KITCHEN  
AREA: 9' x 11'



L - SHAPED KITCHEN W/DINING AREA  
AREA: 10' x 15'

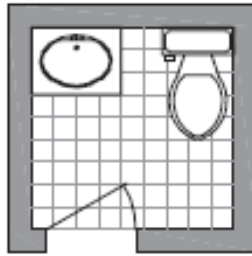


CENTER AISLE KITCHEN  
AREA: 8' x 13'

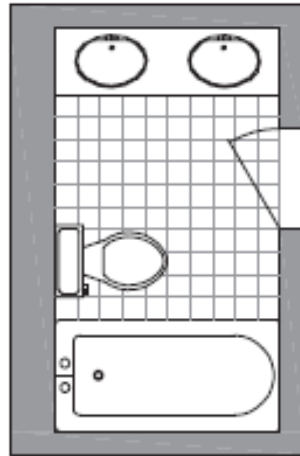


L - SHAPED KITCHEN W/ CENTER ISLAND AND BREAKFAST BAR  
AREA: 10' x 13'

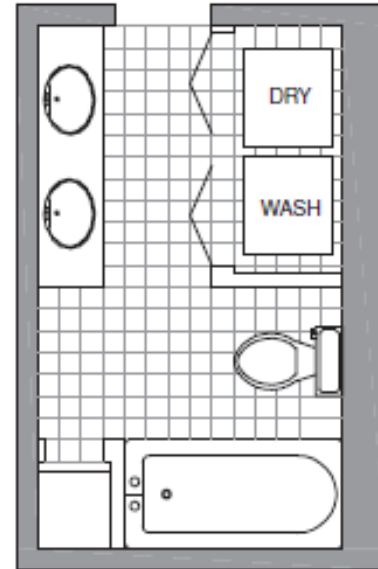
Illus. 3-1 Residential kitchens plans



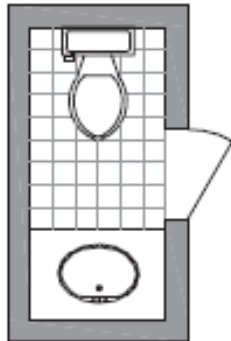
**POWDER ROOM**  
 AREA: 4'-6" × 4'-6" MIN  
 SCALE 1/4" : 1'



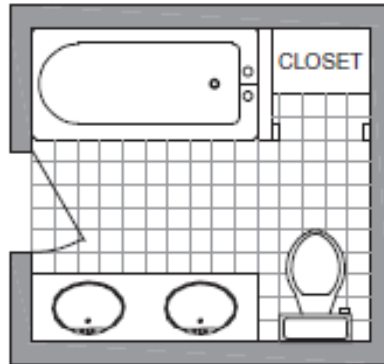
**FULL BATHROOM**  
 AREA: 5' × 9' MIN  
 SCALE 1/4" : 1'



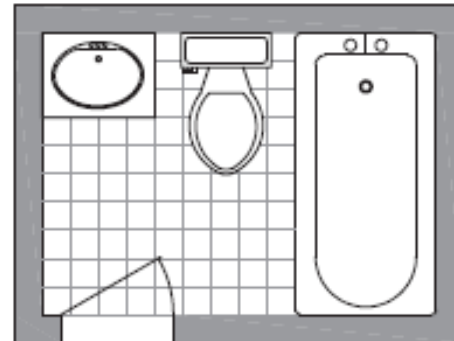
**FULL BATHROOM WITH LINEN CLOSET  
 AND LAUNDRY**  
 AREA: 12' × 7' MIN  
 SCALE 1/4" : 1'



**POWDER ROOM**  
 AREA: 3' × 6'-6" MIN  
 SCALE 1/4" : 1'



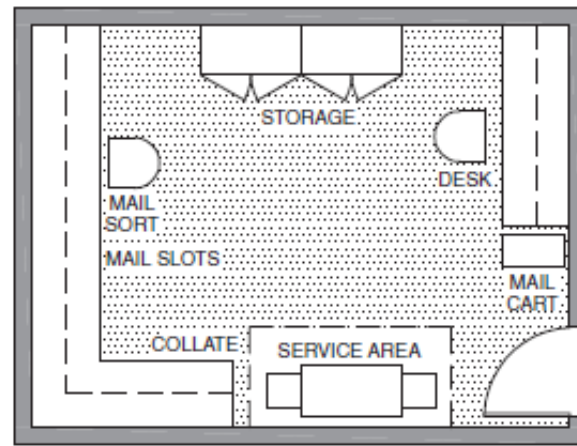
**FULL BATHROOM WITH LINEN CLOSET**  
 AREA: 7'-6" × 7'-0" MIN  
 SCALE 1/4" : 1'



**POWDER ROOM**  
 AREA: 5' 0" X 7' 0" MIN

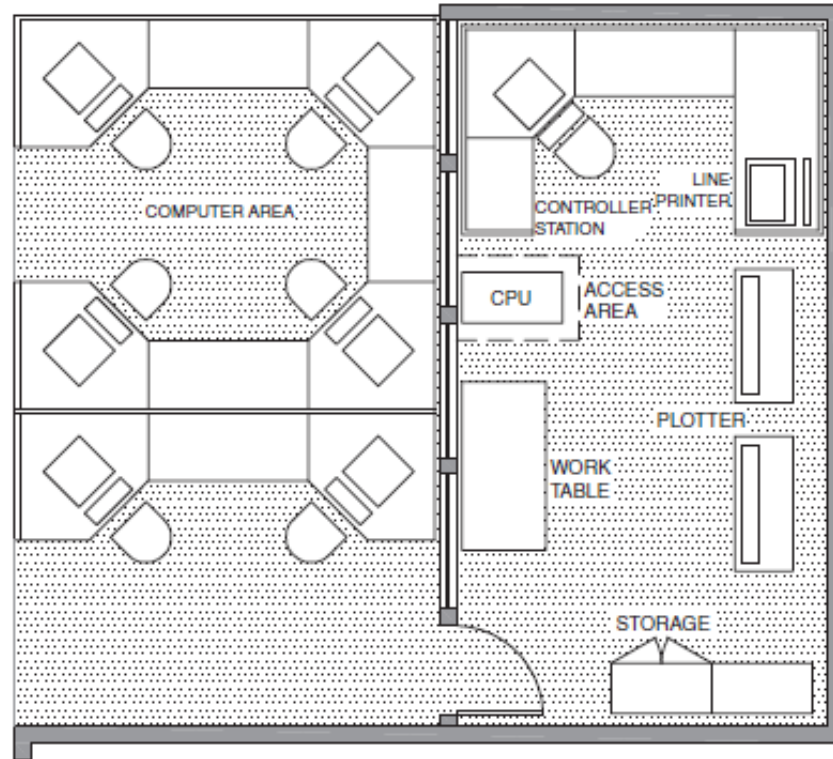
**Illus. 3-2 Residential bathroom plans**

nontypical spaces



SCALE 3/16" : 1'

(a)



SCALE 3/16" : 1'

(b)

Illus. 3-4 Specialized equipment—intensive spaces. (a) Mail/copy; (b) control room with plotters and computer station



# Barrier-Free Design Standards (Universal Design)

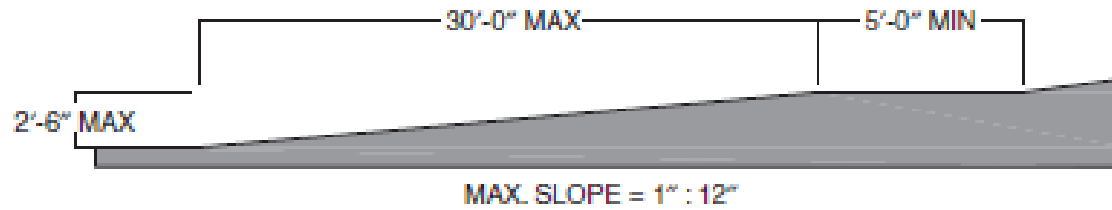
Space planners must know how to accommodate people with physical disabilities, from minor (the early stages of aging) to major (wheelchair users).

This accommodation can be addressed from varying viewpoints:

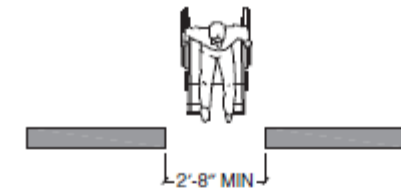
- (1) philosophically, in terms of satisfying a human and social need;
- (2) legally, referring to code requirements that must be fulfilled;
- and (3) pragmatically, insofar as barrier-free concepts should be seen as a means to plan interior spaces that are more comfortable for all users—often referred to as universal design.

## **Four major areas have particular impact on the planning process:**

1. Travel and egress
2. Toilet and bath facilities
3. Residential kitchens
4. Furniture planning and placement

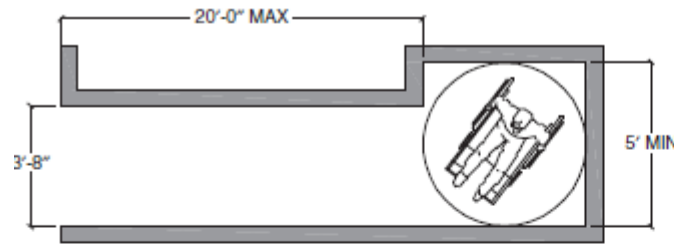


Illus. 3-9 Maximum slope of a ramp

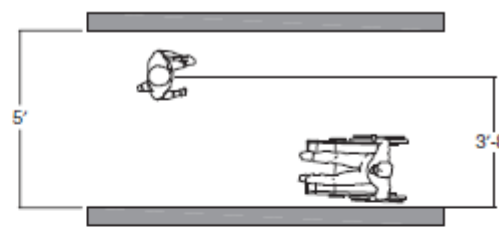


Illus. 3-10 Minimum door opening

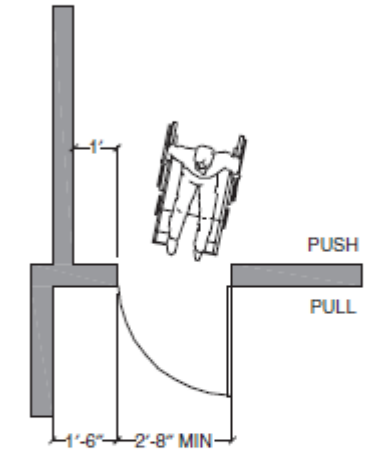
1. Travel and egress  
Corridors and Aisles  
Ramps  
Doors  
Stairs



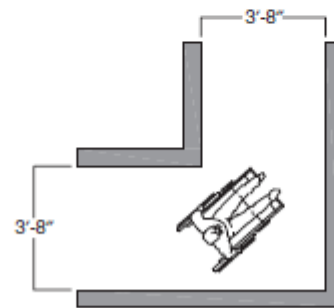
Illus. 3-5 End of corridor turnaround



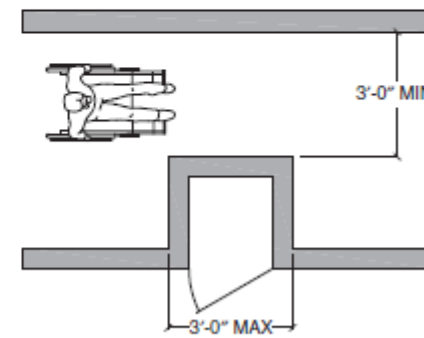
Illus. 3-6 Two-way corridor



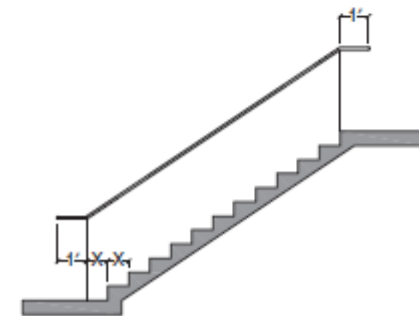
Illus. 3-11 Placement of door hardware



Illus. 3-7 Right angle corridor turn

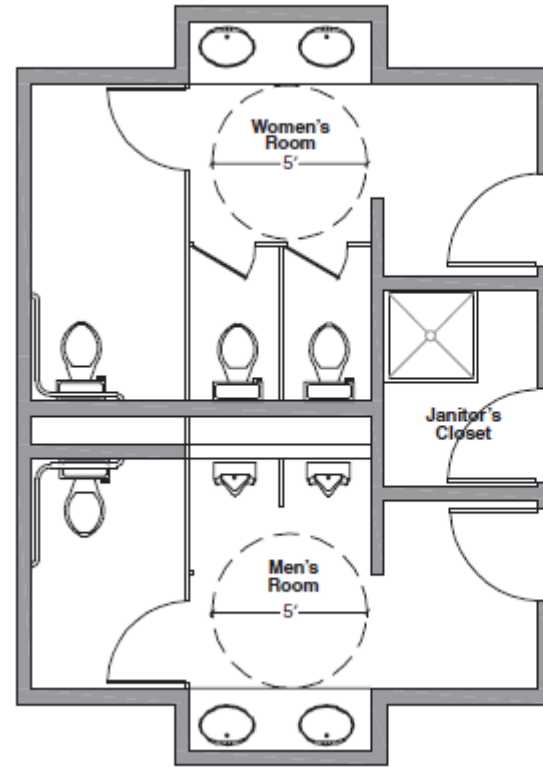


Illus. 3-8 Narrow passageway opening

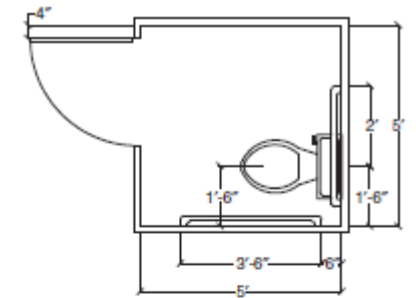


Illus. 3-12 Dimensional requirements for handrails

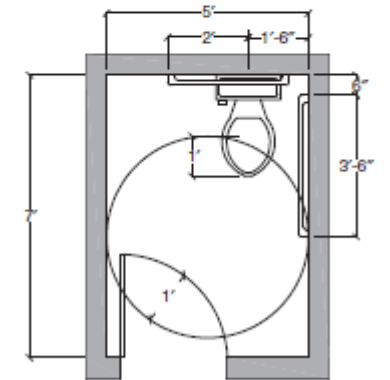
- 2. Toilet and bath facilities
- 3. Residential kitchens



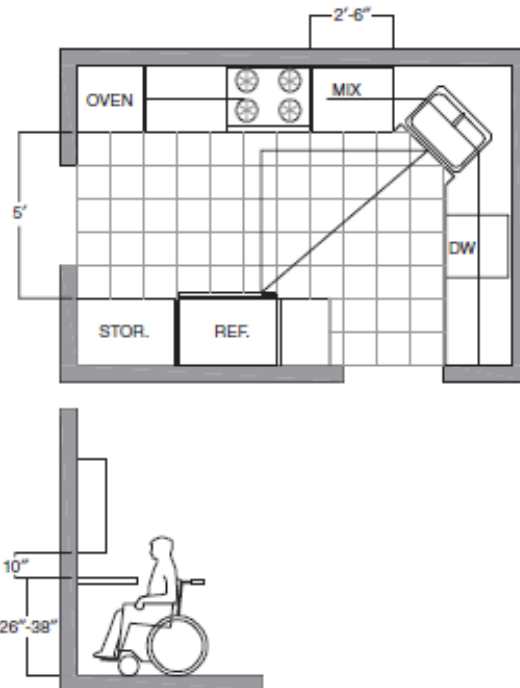
Illus. 3-16 Multifixture women's and men's public restrooms



Illus. 3-13 Dimensional requirements for toilet stalls

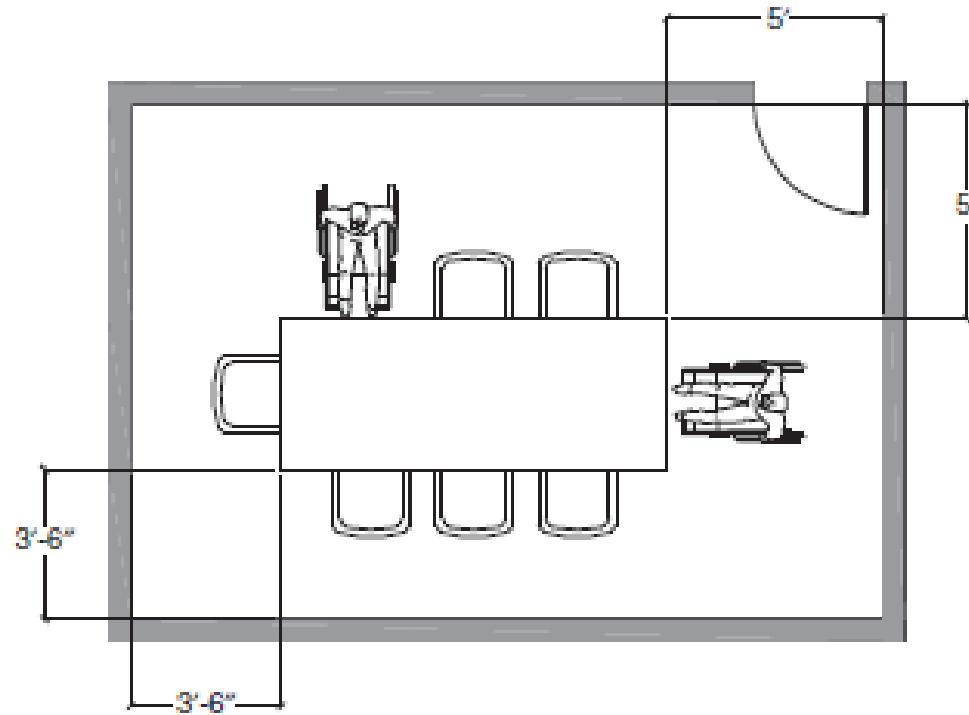


Illus. 3-14 Dimensional requirements for one-fixture toilet rooms

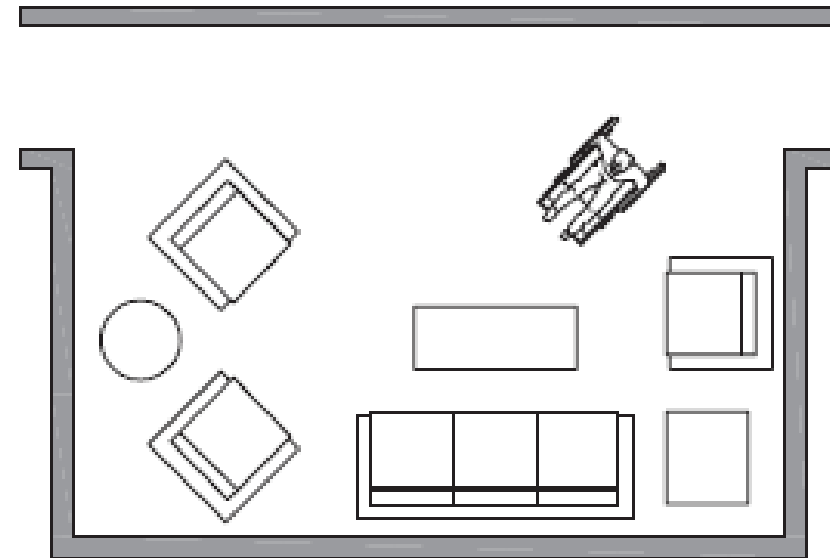


Illus. 3-18 Residential kitchens

## 4. Furniture planning and placement



Illus. 3-19 Conference room



Illus. 3-20 Lounge/living room

# References

- Nielson, K. J., & Taylor, D. A. (2002). Interiors: an introduction. (*No Title*).
- Karlen, M., & Fleming, R. (2016). *Space planning basics*. John Wiley & Sons. 3rd&4th Edition
- Kubba, S. A. (2003). *Space planning for commercial and residential interiors* (No. 19844). McGraw-Hill.



THANK YOU