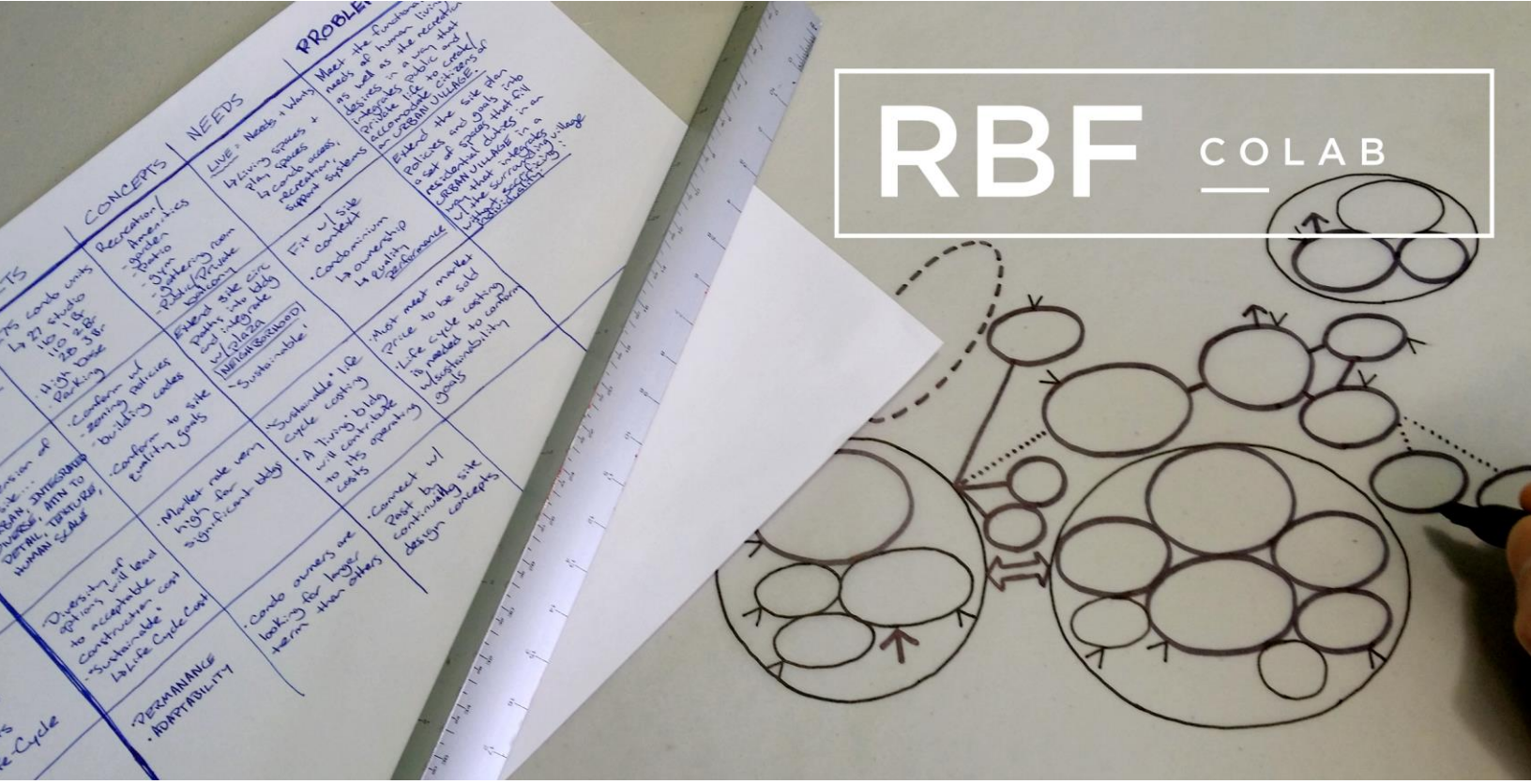


Developing a problem statement and a space flow diagram

THE IMPORTANCE OF PROGRAMMING

Adapted from: http://www.wbdg.org
Revised 5/31/14

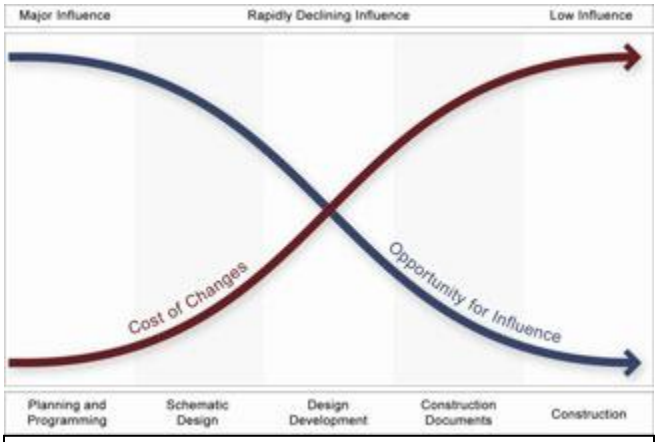
Programming can be the most valuable time you spend with your architect, and yet it is usually the least often performed function of an architect. Programming led by architects can provide owners with a systematic process for decision making about organizational and project values, goals, and requirements. Many owners have a limited view of the range of physical possibilities for accommodating their operations; architects have the ideal professional background to help them visualize options during programming. The programming process as led by the architect can expose owners to a wide range of alternative approaches and help them choose appropriate directions.

Architectural programming is the process of uncovering and prioritizing the underlying goals of a design problem. It is an activity related to, but distinct from, architectural design. When done well, the process will deeply engage the owner to define the project from a variety of vantage points. These definitions will reflect the values and goals of the owner for the project and will create the structure to best achieve the desired outcome for the building design. It is important to not only define the quantitative attributes of a project but also the qualitative aspects that reinforce the owner's vision. A quantitative attribute might include the floor area required to perform a specific task or the performance criteria to achieve sound isolation between spaces. Qualitative attributes evoke emotions or can excite the intellect, for example contemplative spaces. The conclusion of the programming process is a clear road map for the design team to follow as the project design is developed. This will include the tangible and intangible elements that define the overarching goal for the project.

We define architectural programming as the research and decision-making process that identifies the scope of work to be designed. Synonyms include "design brief," "project definition," "functional and operational requirements," and "scoping." Programming at the individual project level provides specific, detailed information to guide building design.

The advantages that architectural programming offers include:

- Involvement of interested parties in the definition of the scope of work prior to the design effort
- Emphasis on gathering and analyzing data early in the process so that the design is based upon sound decisions
- Efficiencies gained by avoiding redesign as requirements emerge during architectural design.



The most cost-effective time to make changes is during programming. This phase of a project is the best time for interested parties to influence the outcome of a project.

To achieve the goal of creating a successful high-performance building, we must take an integrated design approach to the project during the planning and programming phases. Parties involved in the building design should interact closely throughout the design process. The owner and occupants should be involved to contribute their understanding of how the building and its systems will work for them once they occupy it.

A Six-Step Process

Many different programming formats incorporate the same essential elements. In all cases, the design programming fits within a larger context of planning efforts which can also be programmed. For design programming of a building, we propose a six-step process as follows:

Step 1.0 : Define the Project Type

The architect and owner should become familiar with some of the following relevant information:

- The types of spaces frequently included in the building type,
- The space criteria (number of square feet per person or unit) for those spaces,
- Typical relationships of spaces for these functions,
- Typical ratios of net assignable square footage

(NASF—areas that are assigned to a function) to gross square footage (GSF—total area to the outside walls) for this building type,
- Typical costs per square foot for this building type,
- Typical site requirements for the project type,
- Technical, mechanical, electrical, security, or other issues unique to the project type.

Step 2.0 : Establish Goals and Objectives

Working with the owner, the architect solicits and suggests broad goal statements that will guide the remainder of the programming process. Each of the following categories of goals should be addressed:

- *Organizational Goals:* What are the goals of the owners? Where do they see their needs headed? How does this architectural project fit into this broad picture?
- *Form and Image Goals:* What should be the aesthetic and psychological impact of the design? How should it relate to the surroundings? Should its image be similar to or distinct from its neighbors? Are there historic, cultural, and/or context implications?
- *Function Goals:* What major functions will take place in the building? How many people are to be accommodated? How might the building design enhance or impact occupant interactions?
- *Economic Goals:* What is the total project budget? What is the attitude toward initial costs versus long-range operating and maintenance costs? What level of quality is desired (often stated in relation to other existing projects)? What is the attitude toward conservation of resources and sustainability (energy, water, etc.)?
- *Time Goals:* When is the project to be occupied? What types of changes are expected over the next 5, 10, 15, and 20 years?
- *Management Goals:* These goals are not so much an issue of the nature of the project as they are the circumstances of the owner, programmer, or architect. For example, perhaps the schematic design must be completed in time for a legislative request application deadline.

Step 3.0 : Gather Relevant Information

Based upon the goals, the categories of relevant information can be determined and researched. Typical categories include:

- Users, activities, and schedules: Who is doing what, how many people are doing each activity, and when are they doing it?
- What are the space criteria (square feet per person or unit) for the functions to take place?
- What other design criteria may affect architectural programming: access to daylight, acoustics, accessibility, development/area design guidelines, historic preservation, etc.?

- What are the energy usage requirements?
- What code information may affect programming decisions?
- Site analysis: the site is always a major aspect of the design problem and therefore should be included in the program. Site analysis components that often affect design include:
    - Legal description
    - Zoning, design guidelines, and deed restrictions and requirements
    - Traffic (bus, automobile, and pedestrian) considerations
    - Utility availability (a potentially high cost item)
    - Topography
    - Views
    - Built features
    - Climate
- Client's existing house as a resource
    - It may be possible to make use of information at hand. Determine if the current house is satisfactory or obsolete as a resource.
    - If a floor plan exists, do a square foot take-off of the areas for various functions and determine the room sizes, layouts, or other changes that may be required for the future house.
    - Use the existing square footages for comparison when you propose future amounts of space. People can relate to what they already have.

Step 4.0 : Identify Strategies

Programmatic strategies suggest a way to accomplish the goals given what one now knows about the opportunities and constraints. A familiar example of a programmatic strategy is the relationship or "bubble" diagram. These diagrams indicate what functions should be near each other in order for the project to function smoothly. Relationship diagrams can also indicate the desired circulation connections between spaces, what spaces require security or audio privacy, or other aspects of special relationships.

Other types of strategies recur in programs for many different types of projects. Some examples of common categories of programmatic strategies include:

- *Centralization and decentralization:* What function components are grouped together and which are segregated? For example, in some homes the laundry function is centralized in the master bathroom, while in others a separate laundry function exists.
- *Flexibility:* What types of changes are expected for various functions? Does your home need to have the ability to host large family holidays, while still allowing that space to be usable throughout the rest of the year?
- *Flow:* What route will people take to move through the house? What is needed at each step of the way to accommodate that flow?
- *Priorities and phasing:* What are the most important functions to the owner of the house? What could be added later?
- *Levels of access:* Who is allowed where?

Ideally, each of the goals and objectives identified in Step 2 will have some sort of strategy for addressing that goal. Otherwise, either the goal is not very important, or more discussion is required to address how to achieve that goal or objective.

Step 5.0 : Determine Quantitative Requirements

Cost, schedule, and affordable area are interdependent. Costs are affected by inflation through time. Affordable area is determined by available budgets.

In this step, one must reconcile the available budget with the amount of improvements desired within the project time frame. First, a list of spaces is developed to accommodate all of the activities desired. The space criteria researched in Step 3 are the basis of this list of space requirements. The space requirements are listed as net assignable square feet (NASF), referring to the space assigned to an activity, not including circulation to that space.

A percentage for "tare" space is added to the total NASF. Tare space is the area needed for circulation, walls, mechanical, electrical and telephone equipment, wall thickness, and other service uses. Building efficiency is the ratio of NASF to gross square feet (GSF), the total area including the NASF and tare areas. Building efficiency equals NASF/GSF.

The desired GSF is then tested against the available budget. In drafting the total project cost, the programmer uses the cost per square foot amount researched in Step 1. Factors for inflation should be included, based upon the project schedule. Costs should be projected to the date of the mid-point of construction because bidders calculate estimates on the assumption that costs could change from the time of the bid date.

The total project cost includes the construction cost (for building and site work), plus amounts for architect's fees, furniture and equipment, communications, contingency, printing for bid sets, soils tests, topological surveys, and any other costs that must come from the owner's budget. The intention is to help the owner prepare for all the project costs, not just those costs assigned to construction.

If the bottom line for the project costs is more than the budget, four things can happen: 1) space can be trimmed back or delegated to a later phase (a reduction in quantity); 2) the cost per square foot can be reduced (a reduction in quality); 3) both 1 and 2; 4) the owner can agree to an increased budget amount. This reconciliation of the desired space and the available budget is critical to defining a realistic scope of work.

Step 6.0 : Summarize the Program

Finally, once all of the preceding steps are executed, summary statements can be written defining "in a nut shell" the results of the programming effort. All of the pertinent information included above can be documented for the owner and the

design team as well. The decision-makers should sign-off on the scope of work as described in the program.

Once a program is completed and approved by the owner, the information must be integrated into the design process. Some owners want the programmer to stay involved after the programming phase to insure that the requirements defined in the program are realized in the design work.

RBF COLAB
2246 ORAN DRIVE
YOUNGSTOWN, OH 44511
(330) 781-5152
INFO@RBFCOLAB.COM
A COLLABORATIVE LABORATORY OF ARCHITECTURE & DESIGN