

## Research Facility Programming

### Introduction

A well-executed design, whether a research facility or other facility type, doesn't occur in a vacuum and requires informed, discerning programming. As stated in *Problem Seeking*<sup>1</sup> by William Peña, *programming* is, "the search for sufficient information to clarify, to understand, and to state the (architectural) problem". Following from this idea, *design* is the process used to solve the problem.

All too often the programming process is rushed or sometimes completely ignored and the client or owner simply hands their wish list / requirements to an A/E who is then instructed to begin design. This is bad practice for any building but can have even greater implications when dealing with research facilities. By following through with a comprehensive programming process, the owner will be confident their goals will be achieved and the A/E will be confident that design requirements have not been misinterpreted.

### Data Analysis & Research

During the early stages of programming, an A/E should begin thoroughly reviewing all aspects of a proposed site or facility and gather background information. This may be through the form of site surveys, drawings from facility groups, or other sources to identify the constraints and limits on the future design. Additionally, the A/E should have expertise and experience in the type of facility being programmed, providing the researchers and owners an understanding of typical allowances for such things as equipment and research space. If an A/E is not well versed in the particular facility type, then the A/E should educate themselves on similar projects and in some cases may need input from subject matter experts.

### Determining Needs & Wants

One of the most difficult aspects of establishing a project's program is separating the needs and wants of a researcher or other decision makers into tangible, and realistic goals. Fortunately, there are established methods for collecting and documenting this information. Specific and well-thought out questionnaires can aid in identifying project requirements and operational procedures. Questions must include lab workflow, processes, hazards, security, and all key lab operations. These questions are intended to spur conversation from researchers or other project team members and provide the A/E with valuable insight into the key activities that are fundamental to the success of the lab. If an A/E does not understand the processes and workflow which will be used in a lab then all stakeholders will be disappointed with the resulting design, project execution, and operation of the lab. For example, decontamination procedures must be understood for the A/E to provide appropriate finishes and infrastructure. Insightful questions during programming can alleviate significant operational and financial hardships through the life of the facility. Further, the A/E needs to use this dialogue as a means to add value to the design, e.g. provide suggestions which may improve the lab function

versus accepting input without question. Some example Program Questionnaires can be found in the [Design Requirements Manual \(DRM\)](#) Exhibits 2.1 through 2.3.

Client interviews can also be conducted in order to gather project information. Some of the tools used during this process can be items such as interaction matrices or bubble diagrams. Interaction matrices provide a means to document important adjacencies in a facility and additionally the criticality of the adjacency. Bubble diagrams are similar in that they provide a visual representation of the functional and operational relationships among the spaces; however, they also can go further in showing relative sizes of spaces to one another.

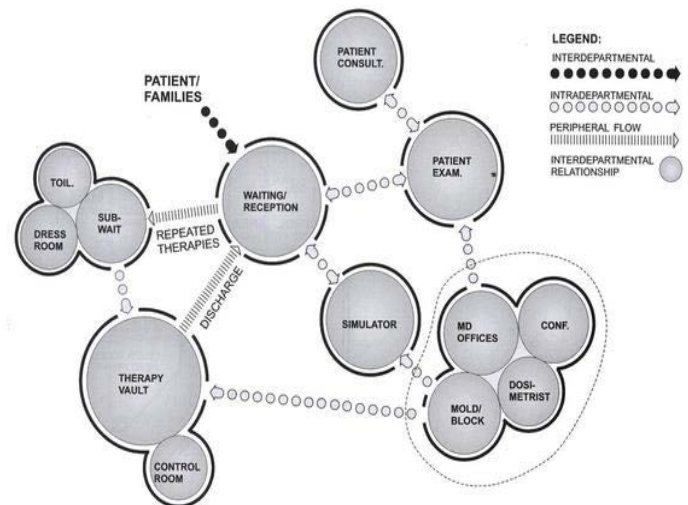


Figure 1: Typical Bubble Diagram<sup>2</sup>

Through these methods and others an A/E should gather enough information to determine what is feasible in terms of: space, quality, money, time, and operational efficiencies.

### Conclusion

In order to proceed into design it is important that the A/E have a full grasp of the problem they are intending to solve. The programming process allows the A/E and owner or client to have a better understanding of the project's goals and limits. Programming is an intensive, fluid, and often difficult process; however, a well-programmed project will be more efficient and will allow all process to be conducted more easily, more productively, and more safely for the life of the facility.

### References

<sup>1</sup>Peña, William, and Steven Parshall. *Problem Seeking: An Architectural Programming Primer*. John Wiley & Sons, Inc., 2001.

<sup>2</sup>Zim, Frank. "Cancer Center Design." *Health Architecture*. Wikifoundry. 19 May 2010. Web. 26 Jul. 2017