

Commitment to Knowledge: Design of a New Academic Health Sciences Library

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The University of Colorado (USA) is relocating its entire Health Sciences campus to a new site. After thriving for eighty years at its current, over-crowded location in a largely residential section of Denver, in 1997 the Health Sciences Center acquired a new parcel of land five times the size of its present site. Construction of new buildings began at the new location in 1999, and will culminate in the entire relocation of all programs and services within a few years. A major factor in the move has been the design of a state-of-the-art biomedical library that will allow the campus to continue providing education and clinical care to all of Colorado's citizens. Investment in the library represents a tangible acknowledgement of the importance of scientific knowledge and evidence-based decision making. The new facility will also allow library staff to continue outreach programs that establish connections and fulfill commitments to providing information services to the state's under-served populations and ethnic minority groups.

Development of the Fitzsimons Campus

The University of Colorado has been extremely fortunate to acquire at no cost a very large property that the Federal government had identified for decommissioning as an Army medical base. The Fitzsimons Army Medical Center had been established in 1918 and for many years provided high quality health services to military personnel and U.S. presidents. The U.S. Congress has been reducing the number of such military bases to reduce costs. Congress wished to demonstrate a successful and highly visible repurposing of this large parcel of land in Colorado. When the University proposed to relocate its Health Sciences Center to Fitzsimons and redevelop the property in cooperation with the local city government, Congress transferred half the land to the University complete with most buildings and furnishings. The northern half of the land was given to a new urban development authority for the purpose of creating a commercial biotechnology research center. The combination of University and commercial development is a once-in-a-century challenge, completely unique in the world. It brings together all of the academic research functions of the Health Sciences Center, several specialized hospitals, and corporate partners from the private sector. Overall, the project requires an investment of \$3.2 billion in U.S. dollars and will give a major boost to the economic development of the entire state of Colorado.

The University investment at Fitzsimons will total about \$1.3 billion when all buildings and roads are completed. Already nearly 20 new buildings are under construction or have been finished. Stunning new clinical facilities and 600,000 square feet of research space are fully operational. Most of the Army buildings that came with the transfer of land were in very poor condition and had to be demolished and replaced. Because the demolition resulted in a large area of open land, it was possible to conceptualize the entire site from scratch. Plans call for clustering new buildings by their purpose so that clinical, education, and research buildings are grouped together for user and employee convenience. Visitors and workers can park their cars once and walk to any of the buildings they need to reach. Colorado also has developed a public rail service to link various parts of the metropolitan area, and a new line will run through the center of the Fitzsimons site, connecting it to the downtown area and to the Denver International Airport.

Over a dozen biotechnology companies have moved into the commercial land on the northern border of the campus. This facilitates collaboration between University scientists and outside researchers who are creating commercial drugs and other products. By the year 2020 the synergy between the University and its partners will have resulted in one of the world's largest concentrations of biomedical education, patient care and research.

Planning for Education Buildings

One of the initial buildings to break ground at Fitzsimons is a shared library storage facility named the Preservation and Access Service Center for Colorado Academic Libraries, or PASCAL for short. Construction of PASCAL began in 1999 and was completed in 2001. It is noteworthy that PASCAL was the first new building at Fitzsimons intended to support the educational mission of the campus. Access to knowledge is critical to today's medical enterprise, and it was vital that library and information services be an early part of the planning for the new campus.

PASCAL is a high-density facility designed to preserve library materials and to store them long-term at lowest possible cost. The initial storage bay measures 10,000 assignable square feet and is able to hold 1.6 million print volumes on ranges of steel shelving that rise 30 feet high. Items are stored by size so that the greatest possible number of volumes can be contained in the smallest possible amount of space. Temperature is steady at 55 degrees Fahrenheit or 13degrees Centigrade, and humidity is maintained at 35%. These conditions should preserve items for several centuries.

PASCAL is a shared facility, housing items from the collections of several libraries at the University of Colorado and also volumes from the libraries at the University of Denver, a private institution. Together, the libraries have loaded nearly a million volumes into PASCAL, and plans are under way to design and build another storage bay of the same size and capacity as the first. At least two more universities are interested in adding their older research materials to PASCAL.

The PASCAL facility is located on the eastern edge of a zone where all new education buildings are being clustered. These education buildings will contain a multi-purpose mix of classrooms, auditoria, small group rooms, laboratories, computer labs, and social spaces that will be shared by the schools of dentistry, medicine, nursing, pharmacy, and the graduate school. Due to the high cost of constructing all new buildings, space must be used very efficiently and all rooms in the education facilities will be heavily scheduled for dedicated use by student classes throughout the year.

New Library Building

The new biomedical library will sit on the western edge of the education zone while PASCAL sits on the eastern edge. Thus two library facilities will serve as bookends that flank and embrace the learning spaces where students congregate. The new library will cost \$35 million in U.S. dollars and has been designed to be one of the architectural signature buildings on the new campus. An eye-catching tower with dramatic rooftop ornamentation will mark the entrance to the library and will be highly visible to visitors. Although ground breaking for the library has been delayed, completion is expected in 2007. It will contain about 112,000 gross square feet of space or about 75,000 assignable square feet, about twice the size of the current Denison Memorial Library that serves the Health Sciences Center.

Nearly half the space will be devoted to computer stations, study tables, casual seating, and group interaction rooms designed for students and faculty. In fact, over 45 small group rooms have been included because our students now work and learn primarily in groups of four to eight individuals. Individual learning in isolation is no longer the normal learning style in the U.S. Because group interaction rooms in the other education buildings will be mostly pre-scheduled for assigned classes, the corresponding rooms in the library are designated as unscheduled space and will be available at the convenience of the users. Thanks to the existence of the PASCAL facility, it has been possible to minimize the space devoted to shelving for the print collection.

In undertaking plans for a new library, it was important to consider the fundamental mission of the Health Sciences Center, changes in the way information is stored and accessed, and what is understood about user behavior. Accordingly, the library staff felt it was crucial that a new mission statement be written for the library in order to reflect accurately the role of the library on the new campus. It was clear to us that technology had become a central and integral part of how the library functions and how users interface with information. It was also clear that the huge amount of obsolete, incomplete, unfounded and even malicious information encountered on the Internet had made some of our users very apprehensive about evaluating the quality and authority of the information they retrieved. Studies in the U.S. have shown that the public views libraries with great confidence, and at Denison we have found that more people are coming to us because they trust our profession to point them to accurate information. In wording our new mission statement, we thought it was important to capture how often the library now serves as a trusted intermediary, hence we came up with the following:

The Library at Fitzsimons will link people, trustworthy biomedical knowledge and technology in support of effective learning, quality health care, and the latest research.

This statement has been fundamental to our thinking as we designed user spaces and thought through the ways in which staff would work with clients. We expect technology, user needs, clinical standards, research techniques, financing, and many other factors to continue to undergo rapid change in the years ahead. For example, the balance of print and electronic information resources will undergo further modification. Consequently, it is vital that the new library space be flexible over time. We anticipate that we may remove some shelving in the future as we either shift more volumes to PASCAL or as older materials become digitized and available online. Plans for stack areas, therefore, include attention to future repurposing of these spaces into user seating or space for emerging technologies. The building is designed to be one of the major data transfer points on the campus network backbone due to the tremendous and growing volume of Internet traffic that flows through the current library. It includes a combination of hard-wired work stations and areas that support wireless connectivity. Because it seems likely that mobile computing and communication devices will replace dedicated desktop computers, electrical and network wiring will be installed in ways that do not limit future rearrangement of space if these physical connections are no longer needed.

The new biomedical library includes space designed to support three dimensional simulation experiences because our faculty created the Visible Human images for the National Library of Medicine. Other simulation software is being used at the Health Sciences Center, and we expect this to become simply another electronic learning tool our students will want to use in the library just as they refer today to illustrations in print atlases to view color slides. Our libraries have rapidly moved away from text-based information and today provide access to content that is wrapped in graphic-intensive interfaces. High tech imaging has become the norm and will continue to evolve as the predominant medium for knowledge communication. Likewise, Internet 2 will foster development of new visual products that will be demanded by our users in the new library.

In hopes that we will be partners with our faculty in the creation and testing of some of these new technologies, we included space for an informatics suite for research and development purposes. Such activities will presumably be funded via grants and contracts, and the space has been left mostly unrefined until we know the exact requirements of the projects that will be housed there. Thinking towards the future has been one of the more challenging and enjoyable parts of our space planning.

Throughout the planning process, however, it has been clear that most of our users come to the current building because they need to interface with library staff or with other information users. Therefore, we have designed the first floor with areas primarily intended to foster interaction and collaboration. We expect the first floor to be a very busy and noisy zone of human interaction, with quiet study areas and enclosed group

rooms on the higher floors. Aesthetic appeal will be critical in drawing users to the new building, and we are very fortunate to be able to highlight many of the wonderful elements of Colorado's lovely climate. Large window areas will afford views to the blue sky, trees and mountains. Porches and a terrace will allow users to actually move outside into the pleasant weather and sunshine. The natural colors of Colorado's abundant wildflowers and stunning terrain will be incorporated into the interior color palette and furnishings. Staff will enjoy coming to work and will never want to leave!

Further discussion and details about the space plans for the new library can be found on the Health Sciences Center's website at the following location:

<http://www.uchsc.edu/instplan/library/index.htm>

Dedication to Meeting User Needs

Underlying all plans for the new library is a commitment to meeting user needs. The building will serve a mix of campus personnel, biotechnology research partners, employees of affiliated hospitals located on the Fitzsimons campus, and the general public. The technological features of the new library will allow us to strengthen our outreach efforts to the clinics serving Native American populations in the far southwestern corner of the state. They will also enhance our ability to deliver information to isolated health practitioners in rural parts of Colorado, mobile clinics serving the health needs of migrant agricultural workers, and other under-served groups. Funding and construction of the new biomedical library are a commitment to both the application of knowledge in all areas of the new campus and equity in meeting the health care needs of all citizens.