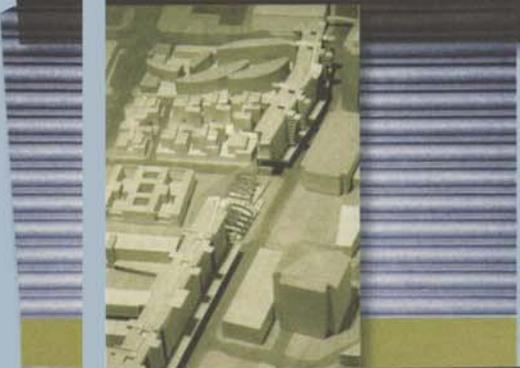




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Program Plan  
for the  
College of Architecture  
and Planning Building

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January 22, 2008

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University of Colorado Denver

University of Colorado Denver  
**Program Plan for the**  
**College of Architecture and Planning Building**  
 January 22, 2008

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# I. Overview

## A. Executive Summary

This project involves the design and construction of a new facility for the College of Architecture and Planning (CAP) to be located on the site of Auraria Higher Education Center (AHEC) campus in Denver, Colorado. The new 120,000 gross square foot building is necessary to support the University of Colorado Denver's (UCD) downtown campus program requirements of the College of Architecture and Planning.

The College of Architecture and Planning is currently among the five or six largest colleges in the US with architecture-related disciplines, with 850 undergraduates in Boulder and 510 graduate students in Denver. Within the vision of integrative design, the college is building prominence and distinction in four key areas: emerging design practices, sustainable urbanism, healthy environments, and preserving heritage.

The College is administered from the UCD campus, where it delivers its professionally accredited Masters' programs in Architecture, Landscape Architecture, Urban and Regional Planning, and Urban Design, as well as a PhD in Design and Planning. The College also manages and delivers a pre-professional Bachelor of Environmental Design on the Boulder campus, through a special funding arrangement that compensates the University of Colorado Boulder (UCB) campus for the space and services it provides to the College. By statute, the College offers the only programs in architecture and planning in the state of Colorado.

Strong, continuing enrollment growth in both Boulder and Denver has left both locations with insufficient space to deliver the College's programs. The College wishes to develop a new, professionally oriented architecture undergraduate program in Denver, to meet a strong demand in the Denver market. A new building will be constructed at UC Denver to accommodate the projected Denver graduate and undergraduate populations. Based on historical strong growth over the previous decades, the College conservatively projects continued growth of 2% per year for the Denver programs for the next decade. The new Denver undergraduate program, approved by the Architecture faculty, will likely attract a different student population than is enrolled in the Boulder Environmental Design Program, so maintaining the Boulder program size does not affect the need for space in Denver. It has been agreed that the number of undergraduates in the Environmental Design Program at Boulder will not be reduced from the approximately 850 headcount that it is today and that Boulder campus leadership will work with the Dean of Architecture and Planning to identify additional space for the Boulder program.

The new building for the College of Architecture and Planning will be constructed on the eastern edge of the Auraria Higher Education Center campus. The College's Denver programs, currently housed in the CU-Denver building location, will be entirely relocated to the new building when completed in July 2011. This will provide approximately 50,000 assignable square feet of space in the CU-Denver building for other UCD programs that are also currently in critical need of new space. The

College will continue to utilize the existing Boulder campus facilities to support its undergraduate Bachelor of Environmental Design (BEnvd) program.

The space within the new facility will include integrated and flexible studio and critique spaces, classrooms and lecture hall, visualization and prototype laboratories, faculty and administrative offices, galleries and multi-function spaces, research center space, student activities space, and related building support spaces.

The project budget is estimated to total \$42 million to include \$15 million in cash funds and \$27 million in state funding. Based upon appropriate approvals, project design will commence on July 1, 2008, and construction in July 2009. Building occupancy is now planned for July 2011.

## ***B. Description of Academic Program***

### **1. College Structure**

Architectural education in Colorado began as a department in Engineering in Boulder in the 1950s, and evolved into an independent College in the 1960s. In the 1970s, following a national reform of architectural education, the College replaced the traditional 5 year Bachelor of Architecture with a model derived from medicine and law: a pre-professional 4 year undergraduate degree followed by professional graduate Masters' degrees. The 4 year degree was located in Boulder, while the new professional Masters' degrees including Architecture, Landscape Architecture, Urban and Regional Planning, and Interior Design (discontinued in the late 1980s) were established on the Denver campus to be closer to the major design and planning firms in Denver. In the 1980s, for reasons not clear today, the Boulder and Denver programs were split into independent units, leaving only a pre-professional degree in Boulder in the College of Environmental Design, and only graduate degrees without an undergraduate base in Denver in the School of Architecture and Planning. When an academic program review in Boulder in the early 1990s recommended closing the College of Environmental Design, a study led by the CU President's office resulted in rejoining the Boulder and Denver units in 1992 into one College administered by Denver, the College of Architecture and Planning (CAP).

This is the current arrangement, in which all College faculty are rostered in UCD, the Dean reports to the UCD Provost, all personnel and students are subject to UCD policies and procedures, and UCD is responsible for the fiscal and administrative welfare of the College. UCD has a financial agreement with UCB, in which UCB collects and retains approximately 55% of the tuition generated by the College's undergraduates on the Boulder campus. This compensates UCB for space, access to courses in other Boulder colleges, and a variety of administrative and student services provided for the CAP undergraduates on the Boulder campus. The College's share of the tuition is used to pay for College faculty and staff assigned to the Boulder undergraduate program, for operating expenses, and for administering the program.

### **2. Vision of the College**

The academic disciplines in the College of Architecture and Planning collectively address the design and planning of society's future built environments, including buildings, landscapes, neighborhoods, towns, cities and regions. In shaping these environments to suit our individual and collective needs and aspirations, designers and planners must take into account a complex range of concerns including technical, environmental, economic, social, cultural, aesthetic and ethical. And in the early decades of the 21<sup>st</sup> century, these complexities have been greatly exacerbated by significant global trends including massive urbanization, global warming, declining non-renewable energy supplies, a global economy overwhelming local identities, and a health crisis created in part by unwalkable neighborhoods and cities. More than ever before, our society needs fresh ideas about how to create healthy, sustainable, meaningful environments.

To help develop these new design and planning ideas, and to help prepare the next generation of designers and planners for addressing these challenges in the future,

the College of Architecture and Planning has developed a vision called **Integrative Design**. This vision directs the College to:

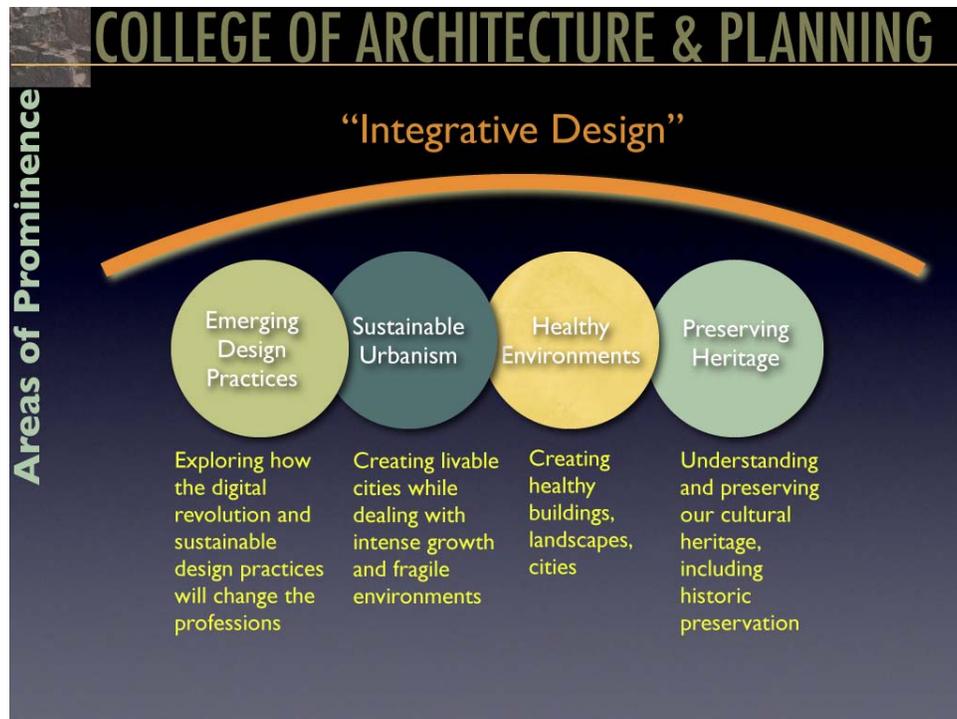
**Tackle design and planning challenges that are significant for our society.**

The College is not an ivory tower. Learning experiences address real issues facing designers and planners as they create healthier, more sustainable, more meaningful environments for the 21<sup>st</sup> century. In recent years, among many other socially important projects, College students have: designed alternatives to suburbia; built award winning-solar powered homes; written new codes to encourage livelier, safer cities; discovered ecological design principles in Colorado ranches; proposed ways for neighborhoods to recover from natural disasters; invented new ideas for affordable housing.

**Tackle these challenges in partnerships among the design and planning disciplines, and with our external communities.** No one discipline can address these issues alone. Architects, landscape architects, planners, urban designers, and developers work together to create holistic, healthy, sustainable environments. Students will participate in multi-disciplinary teams, modeling the practices of today's successful design and planning firms, and interact with outstanding practicing designers and planners in the Denver metro area, through internships, mentorships, design juries, lectures, and engaged student professional organizations.

To implement this vision, the College has organized many of its activities around "communities of interest". These bring together faculty, students and practitioners across the disciplines who share an interest and expertise in a particular theme, building synergistic relationships as they explore new design and planning ideas. The College's communities of interest currently include:

- Emerging Practices in Design
- Sustainable Urbanism
- Healthy Environments
- Preserving Heritage



*Figure 1: Integrative Design Communities of Interest*

These communities of interest are rapidly building areas of prominence and distinction for the college through awards and competition wins. Some recent successes include:

- A team of 30 architecture and engineering students successfully defended its championship and took first place overall in Solar Decathlon 2005. The second international Solar Decathlon on the Washington, D.C. Mall pitted 18 collegiate teams from the U.S. and Puerto Rico, Canada and Spain in a competition to design, build and operate the best solar-powered home, while educating the public about alternative energy. The winning home was built from renewable resources including soybeans, corn and wheat.
- Joining forces with business students, two graduate students won the prestigious 2005 Urban Land Institute Gerald D. Hines Student Urban Design Competition for their redevelopment plan for the Magna Township in Utah’s Salt Lake Valley. The group, which beat teams from Harvard, Columbia and University of Texas-Austin, was lauded for its “evolutionary strategy” backed by a “resourceful business plan.” The team received a \$50,000 cash prize for first place and was further honored in a resolution passed by the Denver City Council.
- Students have helped develop and deliver innovative projects like the Child-Youth Friendly City initiative in Denver, the Neighborhood Atlas Project, and the Collaborative Garden Project. Students working in the Learning Landscapes Initiative have designed more than 40 innovative playgrounds for

the Denver Public School System, and then studied the impacts of these designs on children's behavior.

- Students have joined college research projects to document places like Anasazi Pueblo ruins, Hispanic Homesteads, National Park structures, and Lawrence Halprin's 1970s Denver Skyline Park. A Preservation Design Studio explores issues like adaptive re-use of historic buildings.

These successes have also dramatically increased the College's ability to attract large philanthropic gifts. The following shows the history of fundraising in the College before and after it developed its new vision and implemented its communities of interest:

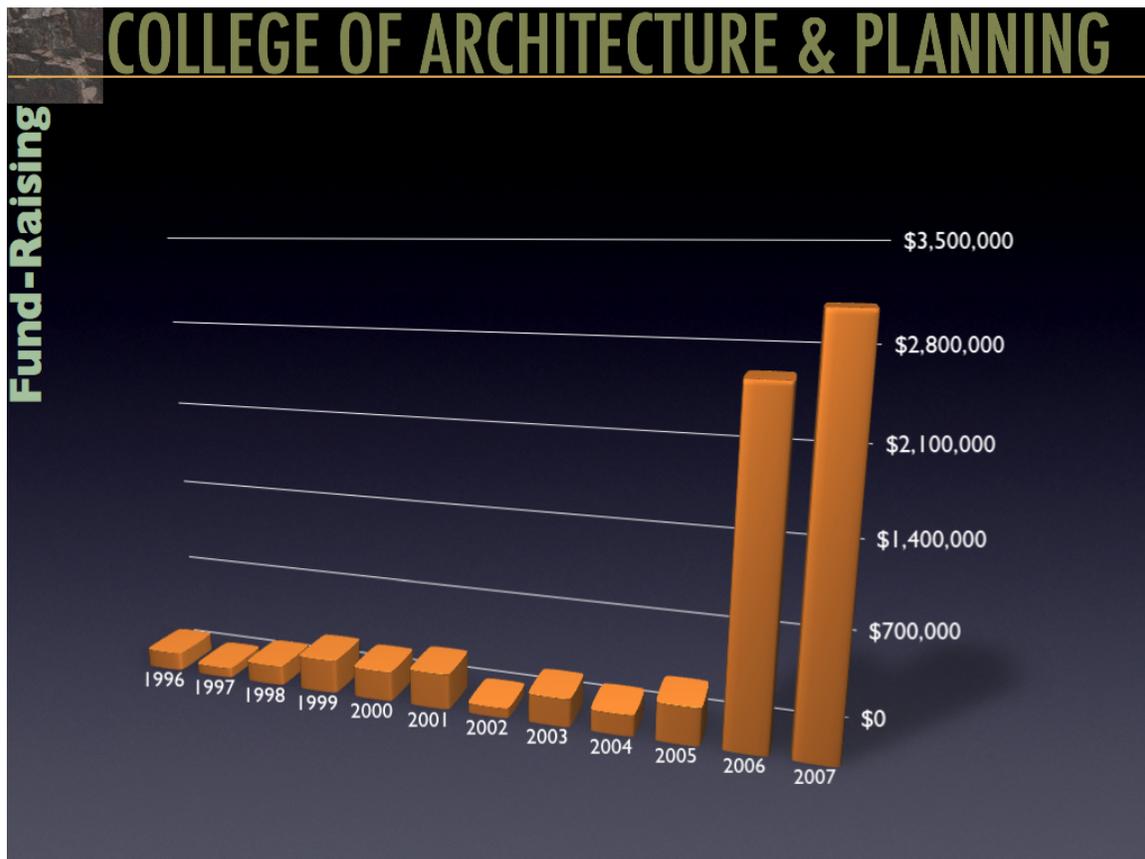


Figure 2: College Fund-raising After Vision Implemented

### 3. Academic Program Profile

The College is administered from the UCD campus, where it also delivers its professionally accredited Masters programs in Architecture, Landscape Architecture, Urban and Regional Planning, and Urban Design, as well as a PhD in Design and Planning. The College also manages and delivers a pre-professional Bachelor of Environmental Design on the Boulder campus, through a special funding arrangement that compensates the UCB campus for the space and services it provides to the College.

The total student headcount of the College in 2006 was 1333, with 501 graduate students, and 832 undergraduates. But because the graduate students take more of their coursework within in the College than do the undergraduates, the full time equivalent students numbers in 2006 (FTES) were 418 for Denver and 571 for Boulder. The number of degrees awarded in FY 2006 totals 180 graduate degrees (Denver) and 173 undergraduate degrees (Boulder). A listing of degree and certificate programs is presented below.

Table 1- Current Degree Programs

<p><b>Boulder Campus</b></p> <p><b>Undergraduate Degree</b></p> <ul style="list-style-type: none"> <li>• Bachelor of Environmental Design</li> </ul> <p><b>Denver Campus</b></p> <p><b>Graduate Degrees</b></p> <ul style="list-style-type: none"> <li>• Master of Architecture</li> <li>• Master of Urban Design</li> <li>• Master of Urban and Regional Planning</li> <li>• Master of Landscape Architecture</li> <li>• Ph. D. in Design and Planning</li> </ul> <p><b>Certificate Programs</b></p> <ul style="list-style-type: none"> <li>• Historic Preservation</li> <li>• Design Build</li> <li>• Geospatial Information Science</li> </ul>
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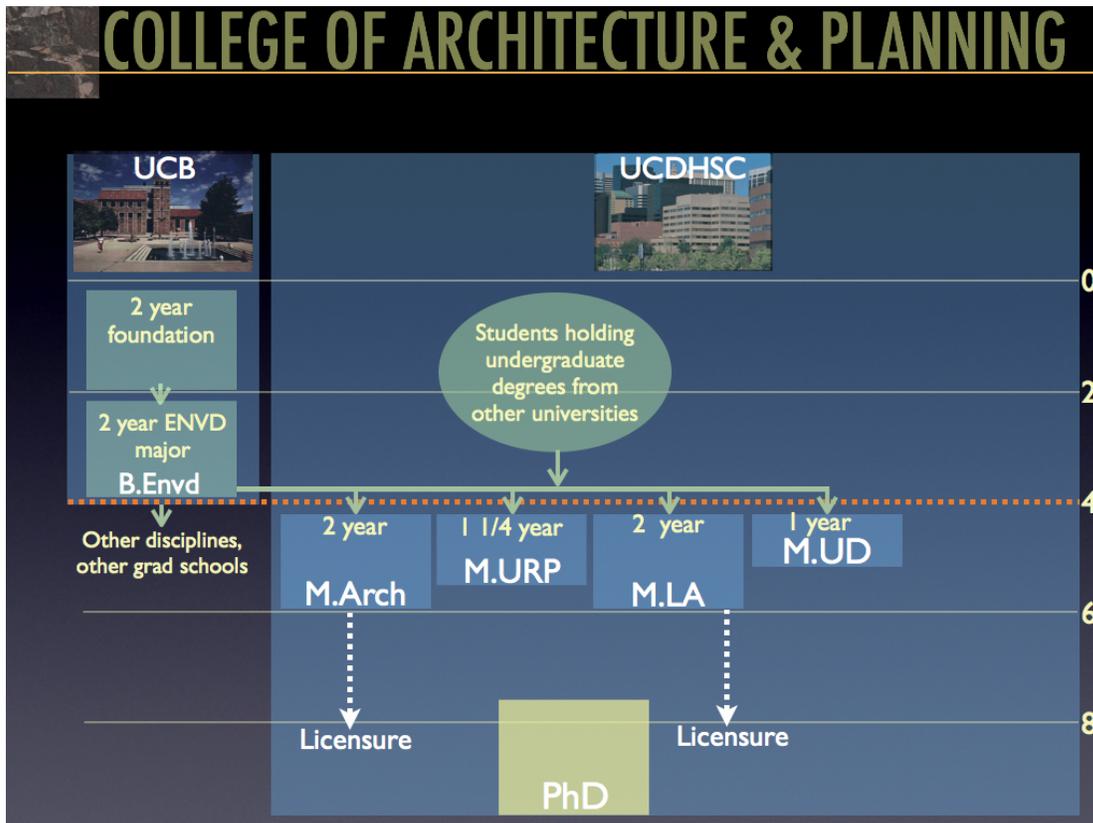


Figure 3: CAP Programs by Locations

## 4. Programs of Study

The College of Architecture and Planning offers a rich set of programs of study, to meet the various needs and interests of the students as well as the accreditation requirements of the professional graduate programs. The best way to explain these programs is to start with Architecture, because the accreditation requirements of this discipline drive the main structure of the College's undergraduate BEnvd. Each of the other programs of study will then be explained in relationship to this.

### **Architecture**

Architecture is a licensed profession in the US, with strict requirements on how students prepare for licensure. Most state registration boards in the US require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), the sole agency authorized to accredit US professional degree programs in architecture, recognizes three types of degrees: the bachelor of architecture, the master of architecture and the doctor of architecture. A program may be granted a 6-year, 3-year, or 2-year term of accreditation, depending on the extent of its conformance with established educational standards.

The national trend is away from the bachelor of architecture towards the two graduate level degrees. The College of Architecture and Planning at CU already made this decision over 30 years ago, so the only accredited professional degree in architecture in the College is the Master of Architecture.

NAAB allows two routes into a Master of Architecture program, and the College delivers both routes. The first route starts with a pre-professional undergraduate degree - the Bachelor of Environmental Design in Boulder - which then leads to study in the Master of Architecture program in Denver. This route typically takes four years of study at the undergraduate level, and then 2 years in the graduate program. When these are taken sequentially, they constitute an accredited professional education; however, the pre-professional degree is not anywhere, by itself, recognized by NAAB as an accredited degree. Students from other universities holding undergraduate pre-professional degrees like a Bachelor of Environmental Design or Bachelor of Arts or Sciences in Architecture can also enroll in the College's two year Master of Architecture.

The second route into the accredited Master of Architecture program is for students who hold undergraduate degrees unrelated to architecture. These students take 3 ½ years to complete the Master of Architecture, because they need to pick up additional courses that the graduates of architecturally related undergraduate degrees already acquired. Students from other countries who hold professional architecture degrees may also take the 3 ½ year program in order to obtain an NAAB accredited architecture degree as a necessary prelude to licensure in the US. Students in both the 2 year and the 3 ½ year program take many of their courses together.

The Master of Architecture is managed by the Architecture Department in the College. Its mission is to lead in the discovery, communication, and application of knowledge in the discipline of architecture. The department aims to excel in the

education of its students, in the research and creative endeavors of its faculty and in service to the community. To respond to this mission, the department has developed a unique intellectual, educational and architectural culture.

- The department celebrates its place in a very special set of landscapes—urbanized Denver and the Front Range and the spectacular natural landscape of the high plains and the Rocky Mountains. The architecture department, therefore, focuses not only on the design of buildings, but also on the interactions between buildings and their urban and natural settings.
- The department examines the interplay between architectural form and the complex cultural and technological context in which architects operate. As a result of these dominant concerns, the department has created an academic environment that is intellectually stimulating and educationally challenging and that aims to educate students who will become leaders in the discipline and profession of architecture.
- The department follows the College of Architecture and Planning’s mission of integrative design. The faculty research, teach and practice ways to design environments that are meaningful and beautiful. The faculty plan, shape and interpret those environments in ways that are collaborative, responsible, sustainable, enabling and integrative. Promoting and acknowledging diversity in subject matter, method and orientation are essential to this integrative approach.

### ***Planning***

Planning is not licensed in the US, but it is professionally accredited by the Planning Accrediting Board (PAB). Planning has primarily focused on graduate education nationally, with relatively few undergraduate programs. The College of Architecture and Planning follows this national trend, offering as its only accredited program the Master of Urban and Regional Planning (MURP) in Denver. This program takes about 1 ¼ years to complete, and accepts students from a number of different kinds of undergraduate programs. Planning also offers a number of courses in the College’s undergraduate BEnvd program in Boulder, in part to meet the interests of students heading for graduate studies in planning at the College and at other universities, and in part to provide an understanding of planning for the architecture students in the BEnvd.

The Master of Urban and Regional Planning is managed by the Department of Planning and Design, whose mission is to:

- Above all the department seeks to educate graduates capable of elevating the norms of ethical planning practice and also carrying these skills and insights into closely allied fields, in all levels of government, within the private sector, and across nations.
- With equal energy, the department aims to restore focus on the core challenges, beliefs, theories and methodologies of the field as an antidote to its very vastness, in the process identifying models of thought and action that can meet the needs of urban societies across the globe and beyond the

millennium. Through research of the highest caliber, the faculty shall advance its understanding of both the process and substance of planning and design, and in so doing help identify, define and solve some of the major environmental, social and developmental challenges now confronting society.

- At the same time, the department is committed to the development of particular domains of advanced expertise that reside within the sprawling enterprise of planning. At the level of undergraduate studies these include emphases in urban studies, physical planning, computational design, sustainability and others. Within the graduate professional Program in Urban and Regional Planning, these include advanced specialty options in physical planning, environmental planning and economic development planning. The faculty also participate in the Master of Urban Design and in the PhD in Design and Planning, described elsewhere.
- Further, the Department benefits from proximity to Architecture and Landscape Architecture with whom it shares residence in the College of Architecture and Planning. Finding bridges for cross-disciplinary study and avenues of collaborative education involving these units remains a priority. The department is equally determined to draw from all other disciplines that may furnish insights to the phenomena the faculty address as teachers, researchers and professionals.
- And finally, the department takes special inspiration from its location in Colorado and in the American West. The challenge of rapid growth and continuing urbanization amidst this magnificent arid isolated landscape of mountains and the high plains is a riveting subject fit for study in and of itself and because there are gains to be had here that can serve other regions as well.

### ***Landscape Architecture***

Landscape Architecture is professionally accredited by the Landscape Architecture Accrediting Board (LAAB), but until very recently it has not been licensed in Colorado. Licensure was just approved for this profession in the last legislative session. Although both undergraduate and graduate programs may be accredited, the College of Architecture and Planning offers only a Master of Landscape Architecture to avoid overlap with an undergraduate landscape architecture degree in Colorado State University. However, Landscape Architecture is beginning to offer some courses in the College's undergraduate BEnvd program, in part to meet the interests of students who may head for graduate studies in Landscape Architecture in the College and in other universities, and in part to introduce landscape architecture content for the architecture and planning students in the BEnvd.

The Master of Landscape Architecture is managed by the Department of Landscape Architecture, whose mission is education, scholarly research and service in the discipline and practice of landscape architecture. The program of study prepares students to engage questions of and relationships among land, landscape, people and culture. It prepares students for the current practice of landscape architecture and provides a healthy setting for students to question,

invent, create, test and advance the knowledge and capacity of the profession. At the program's heart is design, as it embodies the processes that lead to the planning and design of landscapes and that, in turn, results in diverse and assessable outcomes of consequences and value. The program's "laboratories" are the urban, suburban, rural and wilderness landscapes mainly associated with the Mountain, Front Range, High Prairie and Western Slope regions of Colorado. These areas present diverse cultural and environmental situations and opportunities in which to shape regionally responsive landscape design and planning. Imperatives within the public and private realms of these landscapes fuel the academic and research agenda. While representing an accessible spectrum of good and bad examples and situations to study, the knowledge and experiences derived apply globally to multiple scales and cultures.

The current discourse of critical topics includes the following:

- challenges associated with urban and suburban growth and development
- planning and design leading to the making of healthy and sustainable cities, communities and homes
- role and making of civic infrastructure
- use and conservation of precious land and water resources
- reclamation and preservation of disturbed and historic landscapes
- recognition and application of natural and urban conditions and values of the region.

### ***Urban Design***

Urban Design is neither accredited nor licensed in the US. All three disciplines of architecture, planning, and landscape architecture address urban design issues, and so the College delivers this degree with support from all three disciplines. Students will often take this degree jointly with one of the other professional graduate degrees, in order to obtain additional credentials in a field fast rising in importance as the world rapidly urbanizes. This degree may be completed typically in one year.

### ***PhD in Design and Planning***

Historically, the design and planning disciplines have focused on professional education, not on academic research. The terminal degree for practice is still a Master's degree, not a PhD, and there are consequently relatively few PhD programs in these disciplines in the country. But in recent years, as the design and planning challenges have become increasingly more complex and interconnected, the disciplines have begun calling for more bodies of knowledge and evidence bases that can help designers and planners understand the likely consequences of their decisions. PhD programs are emerging nationally to help meet this need, as well as to provide additional credentials for students wishing to enter the professoriate in the design and planning colleges.

The College's PhD program is offered jointly by the three academic departments of Architecture, Landscape Architecture, and Planning and Design, because they all share the idea that the complex problems of the built environment are best addressed through collaboration among the various design and planning disciplines and through developing bodies of knowledge about the built environment. The college's interdisciplinary doctoral program examines the complex factors that help shape the planned and constructed environment. The program offers three areas of specialization:

- **Land Use and Environmental Planning and Design**  
Work in this area focuses on purposeful intervention in the physical environment, including mechanisms and procedures such as land use controls, design review processes and standards, and environmental policies. It also deals with the planning and design of housing, neighborhoods, cities, regions and the interrelationships among residential, economic, recreational and transportation systems.
- **Design and Planning Processes and Practices**  
Work in this area focuses on the theory and methods of planning and design and the development of models and tools to understand and support decision processes and design practices. This area of specialization also includes the examination of practice-related issues such as the development of alternative and appropriate building technologies, energy-efficient designs, manufactured housing and the design/build process.
- **History, Theory and Criticism of the Environment**  
Work in this area involves critical analysis of architecture, urban design, landscape architecture and planning, and of the theories, processes and policies that have regulated these fields. Whether focusing on contemporary or past environments, the aim is to understand and explain them in relation to individual and cultural values and in their cultural and technological contexts.

### ***Certificate and Professional Development Programs***

The College of Architecture and Planning established the office of Professional Development Programs to address lifelong learning interests of professionals and to provide a broader spectrum of services to the community. Complementing the degree programs, Professional Development Programs offers continuing education opportunities intended to help practitioners maintain high levels of competence and achieve professional goals throughout their careers. With a focus on architecture, landscape architecture, planning and design, the College currently offers short courses, certificate programs, seminars, workshops and other educational activities.

Several certificate programs give degree-seeking students an opportunity to pursue an area of specialization in addition to earning a professional degree. Certificates that are available as post-degree professional programs include:

- **Graduate Certificate in Historic Preservation**  
As a result of collaboration between the College of Architecture and Planning

and the Center for Public History in the College of Liberal Arts and Sciences, The University of Colorado at Denver offers a Graduate Certificate in Historic Preservation. The Certificate provides students a grounding in historic preservation and is available to students earning any of the graduate degree programs in the College of Architecture and Planning (MArch, MLA, MURP, MUD, PhD), and students earning the MA in History.

- **Certificate in Design Build**

This certificate program is comprised of five courses and 18 credit hours. While the certificate opportunity currently is offered to students in the graduate architecture program, plans are to eventually make it available to practicing architects.

- **Certificate in Geospatial Information Science**

The emphasis of this certificate is on applications of GIS in urban and environmental planning and design fields. The certificate is available to any student earning one of the graduate degrees; to students earning cognate degrees, for example in GSPA, Engineering or from the Department of Geography; and to non-degree students who have already earned such a degree.

## 5. Research

To reinforce the College vision of Integrative Design, and to provide support and focus for the Communities of Interest, three Research Centers were established in 2003 (a fourth is still in development and will seek approval in AY 2007-08). These Research Centers are:

- **Children, Youth, and Environments Center for Research and Design**

The Children, Youth and Environments Center for Research and Design works with the design professions and allied disciplines to contribute to the health, safety and welfare of children and youth. The Center undertakes and supports interdisciplinary activities in research, teaching and community outreach that connect the worlds of research, policy and practice, while recognizing young people's capacity for meaningful participation in the processes that shape their lives. It focuses in particular on children and youth in environments of disadvantage and those with special needs.

- **Center of Preservation Research**

The primary mission of this Center is to assist Colorado in protecting its heritage in the built environment through research and documentation of historic buildings and landscapes.

- **Colorado Center for Sustainable Urbanism**

This Center facilitates the conversation among Colorado designers, planners, and developers to envision future communities and towns that will enhance the quality of life and moderate the impact of the state's explosive growth.

- **Center for Emerging Practices in Design (pending approval by the University)**

This proposed center will focus on two important themes in the world of design today: Green Design including sustainability, and the Digital Revolution in visualization methods and fabricating processes.

Besides these Research Centers, the College also runs the oldest Center on the UCD downtown campus, the **Colorado Center for Community Development (CCCD)**. This center is a joint outreach center between the College and a technical assistance program of the Department of Local Affairs (DOLA). The Center is a public service unit that for 30 years has provided Colorado with design and planning assistance on a wide range of open space, development and community service issues. The Center assists organizations, communities, and neighborhoods that cannot afford or do not have access to such technical or educational assistance. The efforts of the Center are focused primarily on rural towns, low-income communities, and development organizations.

The following diagram shows the relationship between the Communities of Interest, the Research Centers, and the Service Learning Center, CCCD:

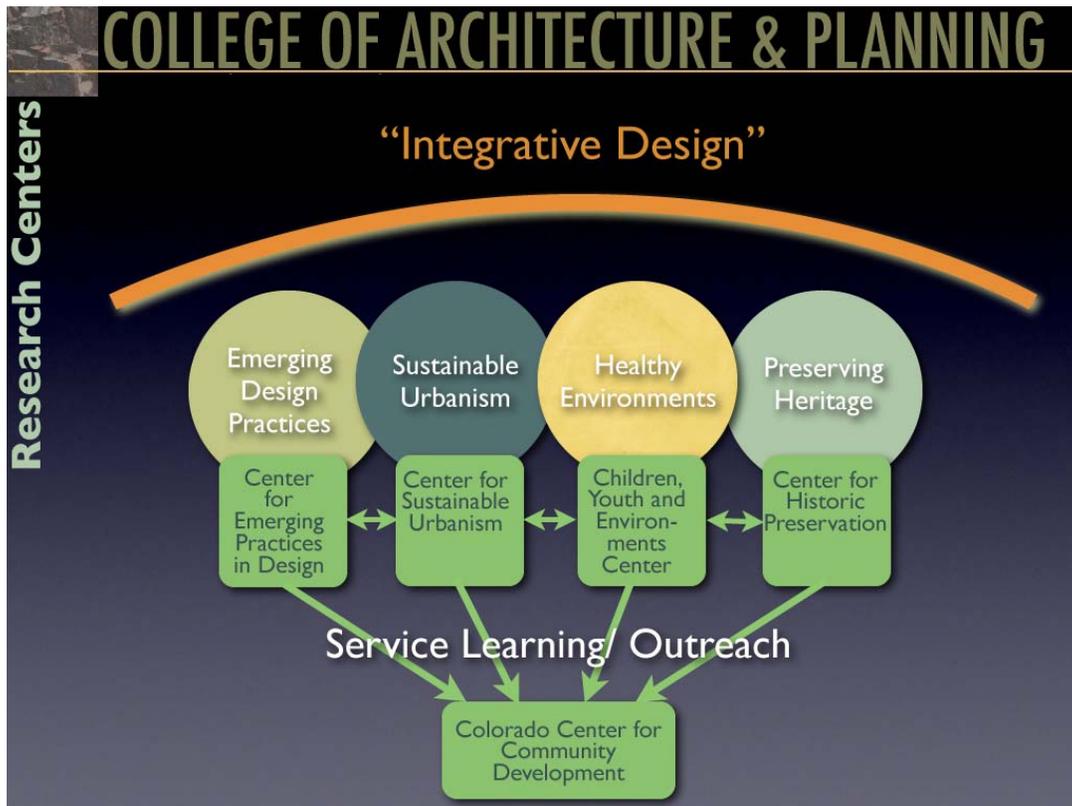


Figure 4: CAP Research Centers

The new Research Centers have been phenomenally successful in focusing the College's research enterprise and providing additional opportunities for the College faculty and students to engage in research related to the design and planning disciplines. The following shows the increase in research dollars since the Centers were founded in 2003:

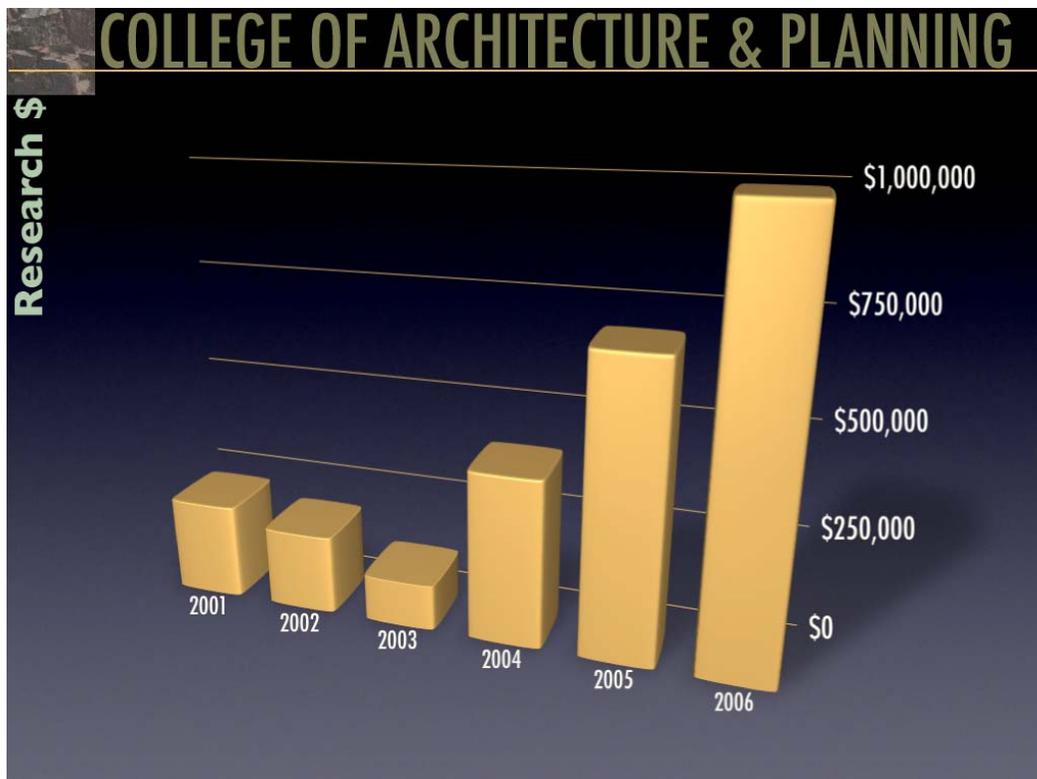


Figure 5: CAP Research Funding by Year

### C. Relationship to Facilities Master Plan

The proposed project is consistent with the Facilities Master Plan entitled Auraria Higher Education Center Master Plan Update. In 2007, the Auraria Higher Education Center Master Plan was updated by the consultant team comprised of Sasaki Associates, studioINSITE and U3 Ventures. The plan was approved by the Auraria Higher Education Center Board of Directors on June 20, 2007. (<http://www.ahec.edu/evpa/aurariamasterplan.pdf>)

The plan includes five development principles:

- 1. Expanding the campus to meet the current and future needs of the institutions**

The Auraria Master Plan Update indicates a current campus space deficit of approximately 732,600 assignable square feet (ASF). The current campus space inventory totals approximately 1.37 million ASF. The total projected campus need is projected to total over 2.55 million ASF by the year 2026, implying a deficit of approximately 46% of total current space compared to the projected need.

The Architecture and Planning project will help achieve this objective by adding much needed instructional, office, studio, and other space to the campus inventory.

**2. Enhance the identity of the institutions**

One of the specific areas of concern cited in the master plan is a lack of institutional identity for each of the three institutions that share the Auraria campus—University of Colorado Denver (UCD), Metropolitan State College of Denver, and Community College of Denver. The master plan addresses this issue by establishing physical neighborhoods for each of the three institutions, with the recommendation that future development reinforce these neighborhoods and create some distinction amongst the institutions. The proposed location of the building serves to reinforce the UCD neighborhood and thus the vision of the 2007 Auraria Master Plan.

**3. Support the educational objectives of the three institutions, with specific emphasis on the student experience outside of the classroom.**

The new building will provide a flexible environment that will foster collaboration through a design of open and interconnected spaces for casual meetings, discussions, formal classes, lectures, and studios. The building is to be conceived as a teaching tool for students to learn about design and building technology, especially sustainable concepts. The building will promote a higher quality of life, creating a special place that inspires creative problem-solving as well as appreciation for resources, both natural and man-made, which shape the built environment.

**4. Create strong connections from campus to the core of downtown Denver.**

This is a major point of emphasis in the 2007 master plan. The master plan and downtown area plan both identify Larimer and Arapahoe Streets as major connectors between campus and downtown. Larimer and Arapahoe Streets run directly adjacent to the sites being proposed for the College of Architecture and Planning. The new facility will play a vital role in bridging the gap across Speer Boulevard, both physically and perceptually, by shortening the travel distance to campus facilities and attracting members of the professional architectural and planning community to partake in learning opportunities and social/networking activities.

**5. Adherence to the principle of sustainable planning and design.**

The 120,000 square foot facility will employ numerous sustainable strategies in an integrated design. The building will adapt to seasonal variations, provide flexibility in space configurations, and accommodate changes in technology. The design will be based upon human needs and ergonomics. The State of Colorado has mandated that all new state funded buildings achieve LEED designation. This facility will achieve that standard.

## **II. Justification**

### ***A. Existing Conditions***

#### **1. Assessment of Space Functionality**

##### **Facilities/Space Profile**

The College of Architecture and Planning (CAP) at the University of Colorado currently offers an undergraduate program in Boulder and graduate programs in Denver. The total program space inventory for the College totals 97,910 assignable square feet (ASF) on the two campus sites – 49,904 ASF in Denver and 48,006 ASF in Boulder. As previously mentioned, the new facility (74,698 ASF/120,000 gross square feet (GSF)), to be located at the Auraria campus, will support the College's existing graduate and proposed undergraduate program. The College will continue to utilize the existing Boulder campus facilities to support its BEnvd undergraduate program. The current CU-Denver space will be vacated by the college upon completion of the new building at the Auraria campus. All CAP programs currently housed in the CU-Denver building location will be relocated to the new facility.

##### ***Denver Facilities***

###### ***CU-Denver Building (49,904 ASF)***

The College's graduate programs and administrative headquarters are located in the CU-Denver Building on the downtown Denver campus. This location provides access to the other UCD and Auraria Higher Education facilities and to the urban amenities of Denver's lower downtown. The 10-story, 160,000 square foot CU-Denver Building located at 1250 14<sup>th</sup> Street in Denver, constructed in 1977, was purchased by the University in June 2006.

##### ***Boulder Facilities***

###### ***Environmental Design Building (30,052 ASF)***

Facilities for the college's program in Boulder are provided in the Environmental Design building. The 76,000 gross square foot building, originally constructed in 1948, is located on the main Boulder campus. On its lower floors are administrative and faculty offices, lecture rooms, and exhibit spaces. A media center, photographic laboratory, slide library, and a model shop supplement design studios, which are found throughout the building.

###### ***Center for Innovation and Creativity (17,954 ASF)***

The college has also, beginning in the spring of 2007, offered its undergraduate students access to specialized workshop and study facilities in the university's Center for Innovation and Creativity, which is located on the CU-Boulder East Campus at 1777 Exposition Drive. UCB gained approval from the Board of Regents to acquire the 90,000 gross square foot facility in fall 2002. The campus purchased it for about \$8.5 million and began renovations in spring 2003.

## Existing Conditions – CU–Denver Building

The new facility development involves only the Denver campus component of the College. As a result, only the relevant existing condition assessment and space information for the Denver facilities (CU-Denver building) will be provided in this report.

The CU-Denver building became part of the Auraria campus in the mid-1980s when UCD began leasing space there, and the Auraria Foundation purchased the building in 1995. The CU-Denver Building was acquired in 2006 as an asset under ownership of the CU System. It currently houses the College of Architecture and Planning, Student Admissions/Affairs, and programs of the Business School, the College of Arts and Media, and the College of Liberal Arts and Sciences. The College of Architecture and Planning occupies and is primarily self-contained in approximately 49,904 ASF in the CU-Denver building. This space is considered by the College to be inadequate in meeting current and projected program space needs. The current allocated CAP space inventory by space type in the CU-Denver building is provided below.

Table 2- Current ASF by Space Type

Space Type	Current ASF	%
Classroom/Conference	6,438	12.9%
Instructional Laboratories	4,603	9.2%
Studio	24,520	49.1%
Exhibition	1,877	3.8%
Faculty Office	4,514	9.0%
Administrative and Staff Office	4,403	8.8%
Centers	2,188	4.4%
Student Offices, Lounge	1,361	2.7%
<b>Total</b>	<b>49,904</b>	

The College's CU-Denver building space is physically fragmented resulting in isolated studios, laboratories, classroom facilities and faculty office space. The current facility does not support flexibility. Not only is the quantity of program space considered insufficient, but the current fragmented space organization in the building also inhibits program interaction and integration. There is currently no space available in the building or at the Denver site for program expansion by the College. The College needs to have its own consolidated space and identity. Identity is of vital importance to the College for enrollment, retention, and for wayfinding. There is also a need for interaction spaces/common areas, flexible places where interaction could occur among programs, for research collaboration, for students, faculty and the community. The College currently occupies space on all of floors three, four, and five, and half of seven, of the eight story building. Diagrams illustrating the current floor adjacencies for the CAP programs located in CU-Denver building follow.

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 1**

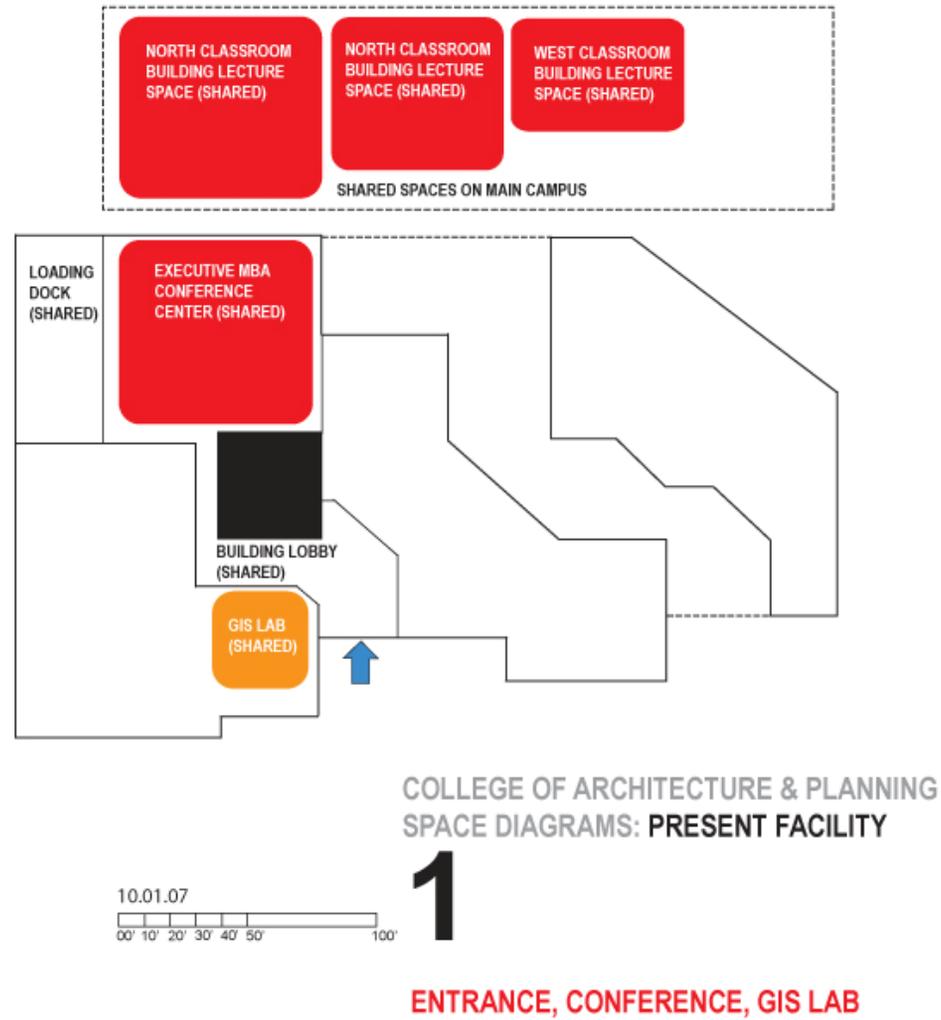
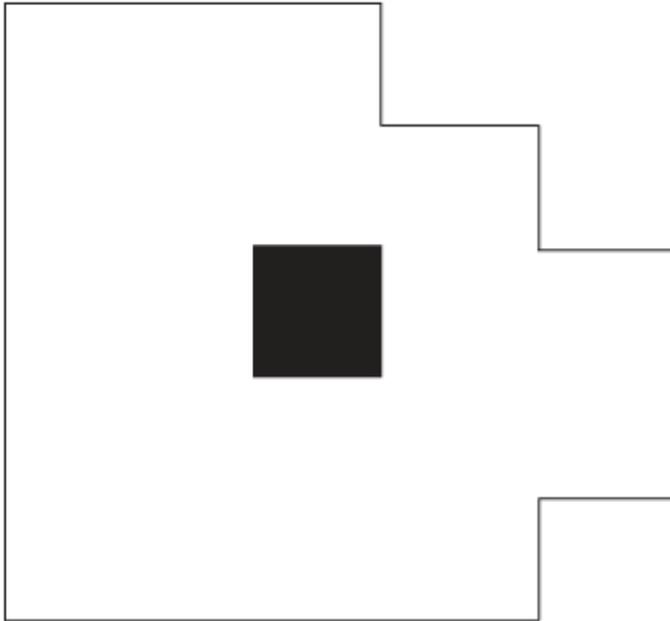


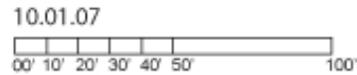
Figure 6: CU-Denver Building Floor 1

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 2**



COLLEGE OF ARCHITECTURE & PLANNING  
SPACE DIAGRAM: PRESENT FACILITY



**2**

**FLOOR PLATE = 35,000 GSF**  
**NO COLLEGE FUNCTIONS**

*Figure 7: CU-Denver Building Floor 2*

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 3**

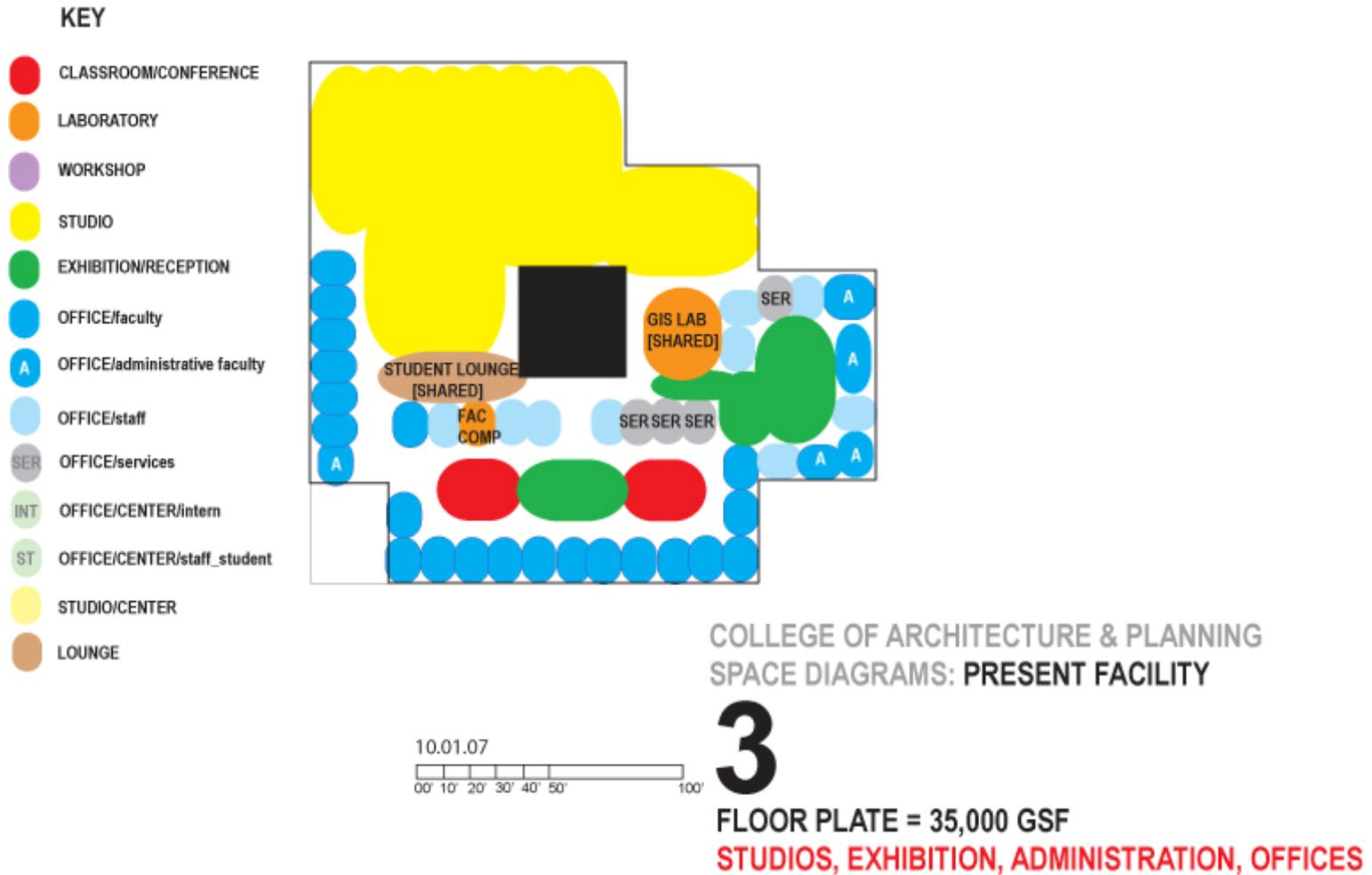


Figure 8: CU-Denver Building Floor 3

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 4**

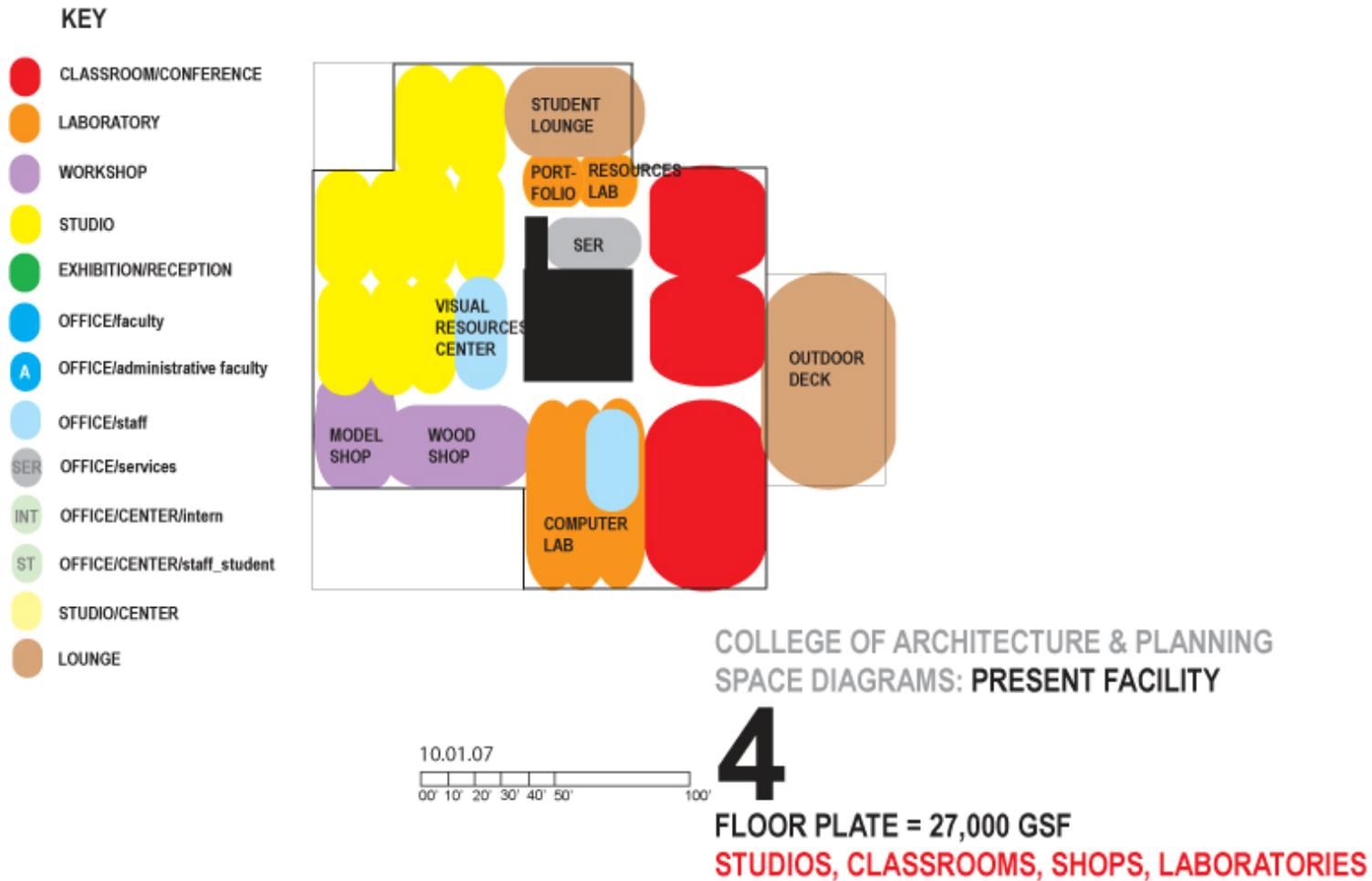


Figure 9: CU-Denver Building Floor 4

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 5**

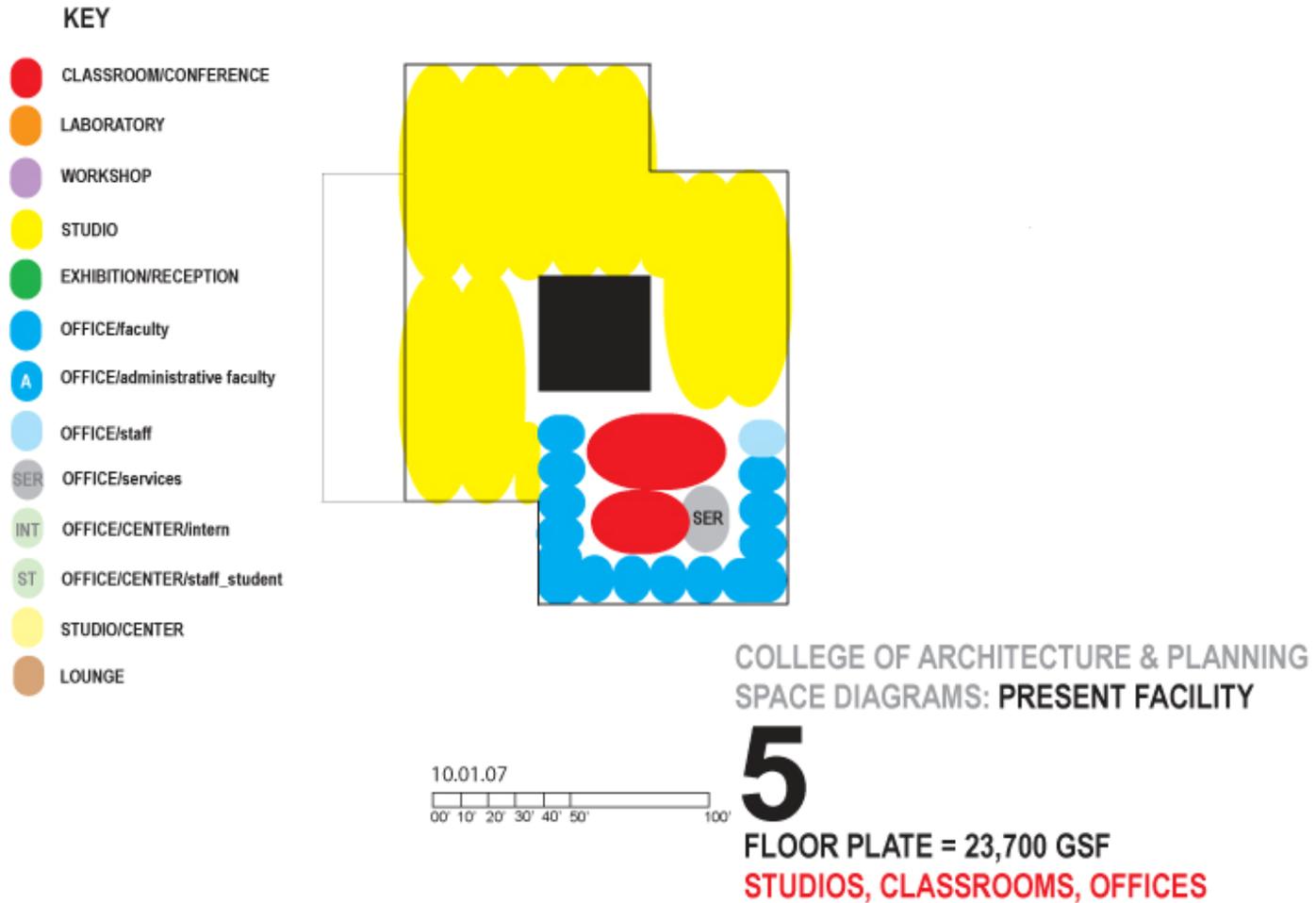
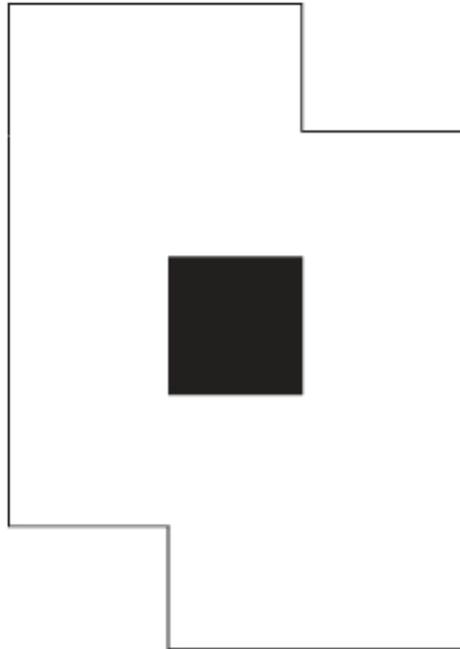


Figure 10: CU-Denver Building Floor 5

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 6**



COLLEGE OF ARCHITECTURE & PLANNING  
SPACE DIAGRAMS: PRESENT FACILITY

**6**

**FLOOR PLATE = 23,700 GSF**

**NO COLLEGE FUNCTIONS**

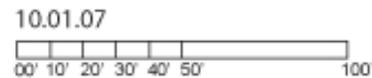
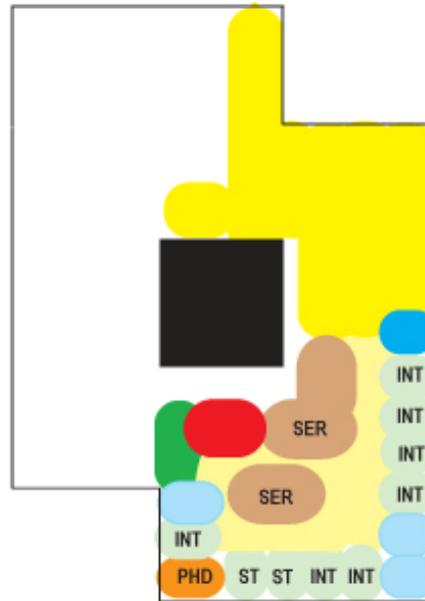


Figure 11: CU-Denver Building Floor 6

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 7**

- KEY**
- CLASSROOM/CONFERENCE
  - LABORATORY
  - WORKSHOP
  - STUDIO
  - EXHIBITION/RECEPTION
  - OFFICE/faculty
  - A OFFICE/administrative faculty
  - OFFICE/staff
  - SER OFFICE/services
  - INT OFFICE/CENTER/intern
  - ST OFFICE/CENTER/staff\_student
  - STUDIO/CENTER
  - LOUNGE



COLLEGE OF ARCHITECTURE & PLANNING  
SPACE DIAGRAMS: PRESENT FACILITY

**7**

**FLOOR PLATE = 23,700 GSF**

**STUDIOS, RESEARCH & OUTREACH CENTERS**

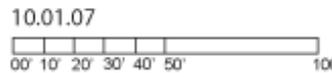
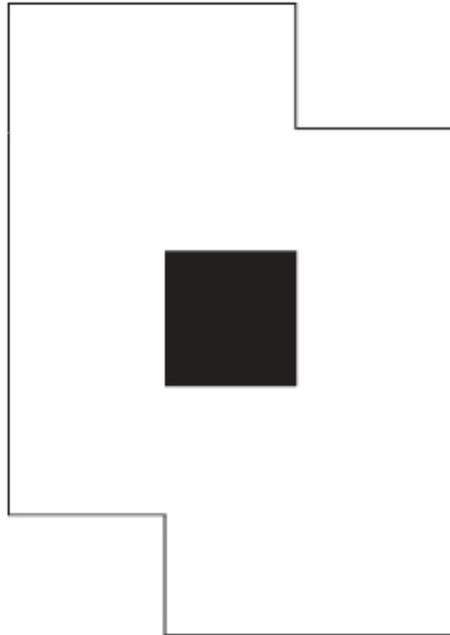


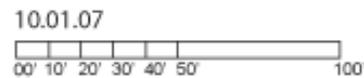
Figure 12: CU-Denver Building Floor 7

**CU-Denver Building – Current Floor Adjacency Diagrams  
College of Architecture and Planning**

**Floor 8**



COLLEGE OF ARCHITECTURE & PLANNING  
SPACE DIAGRAMS: PRESENT FACILITY



**8**

**FLOOR PLATE = 23,700 GSF**  
**NO COLLEGE FUNCTIONS**

*Figure 13: CU-Denver Building Floor*

Ample and appropriately outfitted instructional space is a crucial factor for attracting and retaining students in design-oriented programs, where their project-based coursework requires significantly more space than traditional lecture-style instruction. Specific space challenges include severe overcrowding in student studios, inadequate faculty office space and absence of space to accommodate the expanding research mission and graduate student enrollment.

The existing lack of quality space for studio instruction, offices and research is at a critical juncture for the College. The CAP programs have grown beyond their capacity, putting the College at a competitive disadvantage with its peer schools in attracting and retaining top faculty and graduate students. This situation also makes expansion of existing programs quite difficult. To maintain its position and improve upon its ranking, the College needs to expand its infrastructure capacity in the teaching and learning environment.

## 2. Space Utilization by Classroom/Lab Hours of Use & % Station Utilization

The summary of the classroom/laboratory utilization for Fall 2006 for the College of Architecture and Planning for the Denver campus is presented below.

Table 3 -CAP Classroom Utilization Summary

	Meeting Hours (1 hour = 50 min)	Student Contact Hours (hours * enrollment)	Student Credit Hours	Average Occupancy
<b>Building</b>			1,670	
CU-DENVER BUILDING, 1250 14TH ST	237	6,723	3,240	72%
NORTH CLASSROOM BUILDING	19	961	918	54%
PLAZA BUILDING (FORMERLY ST)	3	159	159	78%
UNASSIGNED	6	48	24	.
A&P Total	265	7,891	6,011	70%

Table reflects information adjusted for passing periods using calculation of hours = minutes/50.

Please refer to Appendix B for the detailed utilization information.

## 3. Facilities Condition Report

Over the long term the university has provided all building operating and maintenance services, including some capital improvements. The 1977 constructed, 8-floor building is showing its age and is in need of system improvements. At this time a number of building projects are underway, including elevator and HVAC system improvements. A complete building facilities audit report is included in Appendix C. A summary of the audit report follows.

## Facilities Audit Summary Report

**Building Name:** CU-Denver Building (DRAVO)  
**Campus/Location:** Downtown Denver  
**Occupancy Type:** office, student auditorium, records storage, computer-server  
**Gross Space (sq ft):** 159,573  
**Number of Levels:** 8  
**Year Built:** 1977  
**Year Remodeled:**  
**Date Inspected:** July 2006

**Building Estimated Current Replacement Value (C.R.V.):** \$ 17,495,134

Summary: Assessment Rating & Deficiency Cost

Building Component	System Deficiency Rating	Building Component Multiplier	Component Value (C.R.V.)	Estimated Cost of Deficiency
Building Structure	83%	0.31	5,423,492	949,111
HVAC Systems	26%	0.40	6,998,054	5,150,567
Plumbing Systems	71%	0.07	1,224,659	355,764
Electrical Systems	74%	0.15	2,624,270	675,750
Code Compliance & Safety	52%	0.07	1,224,659	590,163
<b>100%=Perfect</b>			<b>Total: \$7,721,355</b>	

Facilities Condition Index (1 - (Deficiency/C.R.V.)) X 100 = F.C.I.

$$\text{F.C.I.} = \frac{\text{Cost of Deficiency}}{\text{C.R.V.}} = \frac{\$ 7,721,355}{\$ 17,495,134} = 55.9\%$$

The CU-Denver Building was acquired as an asset under ownership of the CU System, even though this building has been continually occupied by university programs over a long time period. The long term space lease arrangement placed the university as a de facto owner without holding title to the property. Over the long term the university has provided all building operating and maintenance services, including some capital improvements and paying for all required utilities.

#### 4. Health/Life Safety Deficiencies

Please refer to the audit report for the detailed facilities audit for building health/life safety deficiency information. Many of these issues noted in the report have/are in the process of being addressed.

### *Fire Protection & Life Safety*

As a priority need, an emergency power generator should be installed to serve the fire pump and should be sized large enough to feed emergency exit lighting (which would allow for the removal of battery operated exit lights – and ongoing O&M cost). Included in this project is a need for ATO switchgear to transfer power in the event of utility power interruption.

Egress problems are another need that must be addressed. At the Annex Building, there is a “stairway to nowhere”. Apparently there was previous work that may have been done for security reasons. At that time, a metal pan was installed with poured concrete on top that blocks entry to the first floor, thereby creating a dead-end corridor. This is in violation of fire code and needs to be corrected.

Another fire protection improvement is a required upgrade to the elevator recall system. Upgrades are required per code to improve the current system. Denver Fire Dept defines Phase 1 and Phase 2 improvements. Phase 1, which returns the car to the ground floor, has been done; Phase 2, which allows the fire department to control the elevator through use of a fire key, will need to be completed in the future.

### *Public Refuge Area*

Providing areas of refuge may be code required, though additional work needs to be done in this area, especially existing conditions investigation. The integrity of fire-rated barriers needs to be maintained. This may include space air pressure control for the refuge area - and/or just the elevator shaft. Apparently a fan/damper system was designed for pressurization of the elevator shaft (there are no fire-rated walls that could allow for pressurization of the elevator lobbies), though the integrity of this system has not been maintained.

Most modern facilities meet code requirements through a sprinkler-system using booster pump pressurization, automatic heat-detected activation, and automatic notification to the local fire protection district serving the municipality. Additional features include pull-stations for hand activated emergency response, audible fire alarming and strobe lights, illuminated exit lights, and specially constructed egress paths (public corridors constructed with floor-to-ceiling structure participations to minimize smoke travel, special fire rated doors, and walls constructed with fire rated gypsum drywall board). These areas must be addressed by design and construction firms specializing in this area.

### *Miscellaneous*

General safety concerns that need ongoing attention include: exit lighting, fire-rated barriers (partitions extending to structure where required, eliminating holes in fire-rated partitions above the ceiling), insuring sprinkler head coverage, maintain egress passage, machine rooms may need to be sprinkled.

### *ADA Compliance*

Public facilities are required to meet pertinent ADA regulations of the Americans with Disabilities Act to improve access for handicapped individuals. This building appears to have made adequate and reasonable accommodation – though there

are several smaller items that need ADA attention and should be further investigated. The facility should make every reasonable attempt to ensure compliance with ADA requirements. Apparently there is only one ADA accessible bathroom arrangement which is located on the 4<sup>th</sup> floor – this should be expanded (most bathrooms should be updated).

#### *Hazardous Materials*

Buildings constructed in the early 1970's or earlier often times have problems associated with pipe and duct insulation that has asbestos containing materials (ACM). This building was built in 1977 and consequently there is no evidence of asbestos problems.

## **B. Changes and Projections**

Three changes are driving the need for new space for the College of Architecture and Planning:

1. a proposed new undergraduate program in architecture in Denver
2. continued, strong enrollment growth
3. a change in pedagogy throughout the College that is focusing more on lab-based projects.

### **1. Proposed Undergraduate Degree in Denver**

To meet strong additional demand for architectural education in the Denver area, the College will be proposing a new undergraduate degree located on the Denver campus, a Bachelor of Arts in Architecture. This is distinct from the College's existing Bachelor of Environmental Design delivered in Boulder, since it will be serving a different market. The admissions office in the UCD downtown campus regularly receives requests from potential students who would like to study architecture in Denver, and who are not interested or willing to attend in Boulder. A number would like to transfer from the architecturally related community college programs in Denver, including the Interior Design program at Arapahoe and Architectural Technology at Red Rocks. Many of the potential students are also from more diverse backgrounds in Denver who would prefer to study at an urban campus. The College would like to serve this population, which is not and cannot be served by the existing Boulder program.

The College proposes to implement a four year Bachelor of Arts in Architecture, followed by an intensive 1 ½ year Master of Architecture. As explained above in the section on the program of study in architecture, the National Architectural Accrediting Board (NAAB) supports a sequential course of study starting with a pre-professional undergraduate degree followed by a Master of Architecture. This traditionally requires 2 years of study at the graduate level. But in the last few years, NAAB has changed its accreditation requirements to allow an accelerated 1 ½ year Master degree if the graduate degree is carefully coordinated with the undergraduate requirements. A handful of colleges around the country including some regional competitors have already implemented this accelerated degree, which would reduce the time and tuition required for a fast track to licensure.

Unlike the existing BEnvd, which gives a general introduction to the design and planning fields and requires an additional two years of study at the Master's level to achieve professional competence, this proposed degree would focus more intensively on professionally oriented courses at the undergraduate level, requiring only 1 ½ years to complete at the Master's level. The coursework for this Master of Architecture would largely be the same as the coursework for the 2 year Master's degree (for students coming in with the BEnvd), and the 3 ½ year Master's degree (for students coming in with an undergraduate degree unrelated to architecture); the differences in length are entirely a function of the types of courses taken as undergraduates.

It is anticipated that the new Denver undergraduate program will attract a different student population than is enrolled in the Boulder Environmental Design Program. As a result, maintaining the Boulder program size will not affect the need for space in Denver. Strong, continuing enrollment growth in both Boulder and Denver has left both locations with insufficient space to deliver the College's programs. It has been agreed that the number of undergraduates in the Environmental Design Program at Boulder will not be reduced from the approximately 850 headcount that it is today and that Boulder campus leadership will work with the Dean of Architecture and Planning to identify additional space for the Boulder program. Specific space requirements and plan for the Boulder campus program are yet to be determined.

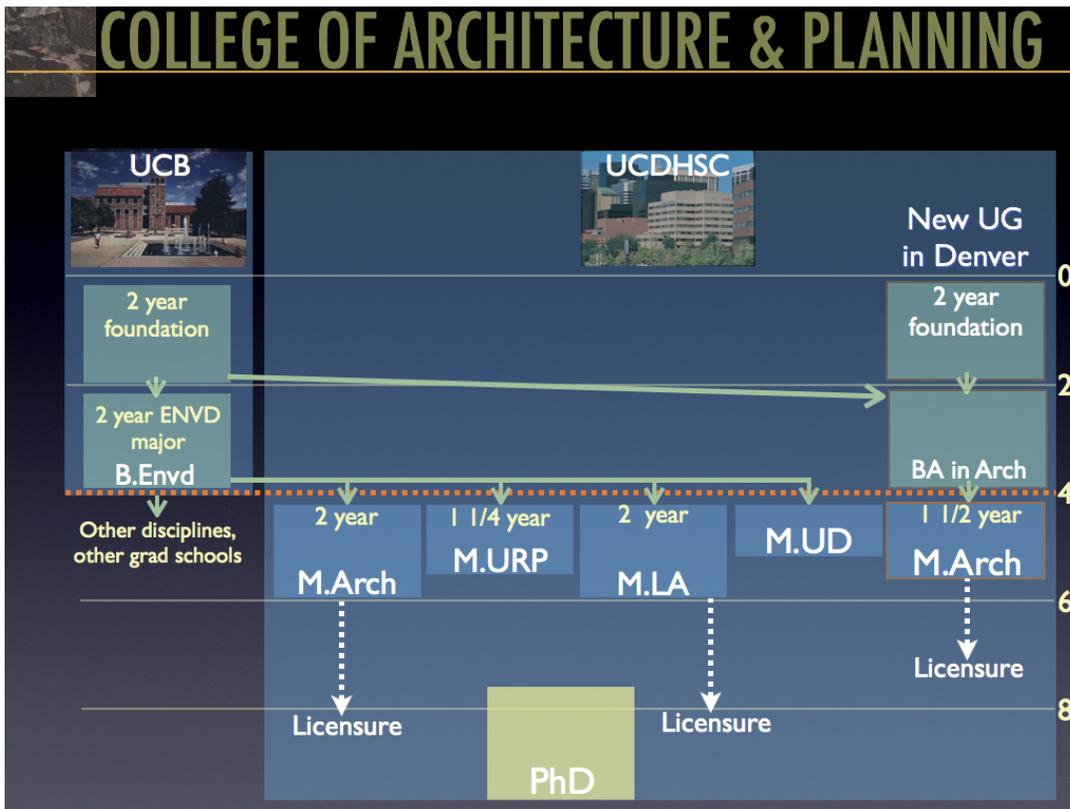


Figure 14: CAP Programs including new 5 1/2 Year Denver program

## 2. Enrollment Growth

The College has experienced strong enrollment growth for over a decade, averaging around 3% annually in the undergraduate program, and around 5% in the graduate programs. The enrollments spiked in 2004-05 and then dropped back to historic trends, when tuition was raised dramatically (around 50% for the graduate students). This strong enrollment echoes national trends. The College conservatively projects that it could grow by about 2% per year indefinitely.

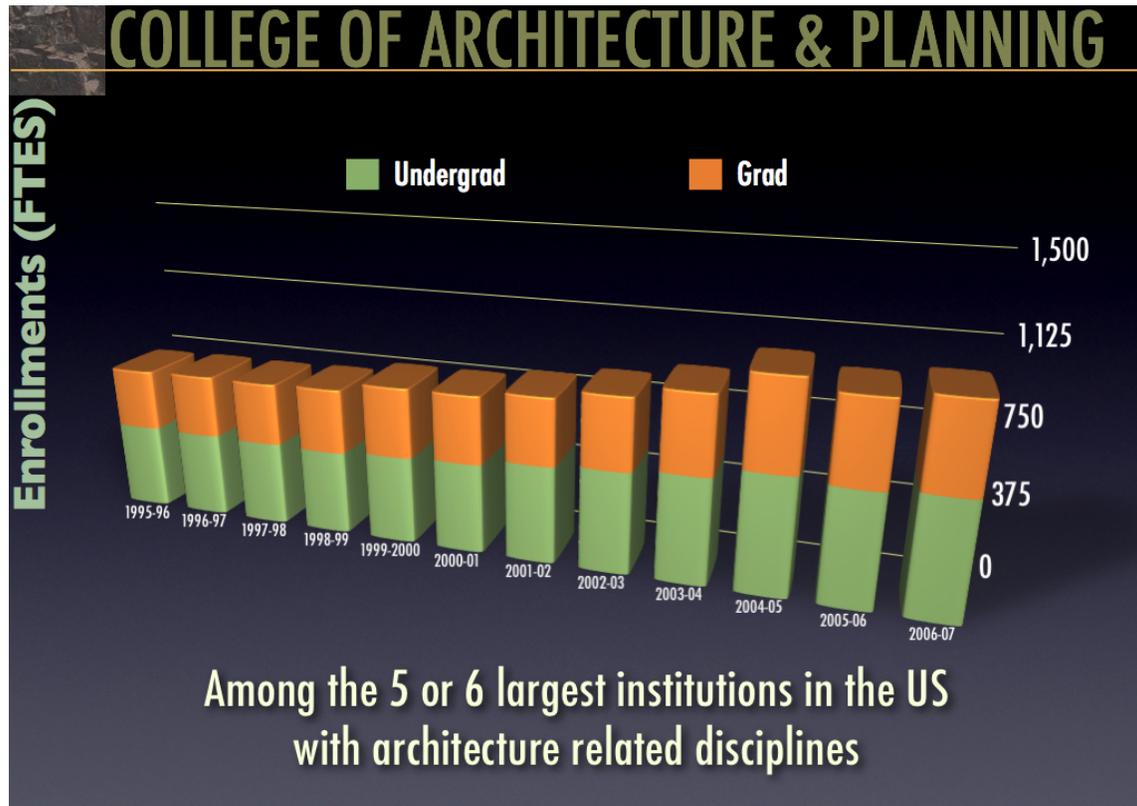


Figure 15: CAP Historical Enrollments

Taking into account the need for a new undergraduate program in Denver and the continuing strong enrollment demand for the College as a whole, the College projects the following assumptions:

1. The College has been experiencing steady growth for several decades at an average rate since 2001 of 5% for the graduate programs in Denver. The College estimates a modest 2% for future projections. The College projects enrollments for a proposed undergraduate degree in Denver as part of the space needs for the new building. These projected enrollments will come from a new Denver market, including students coming in part out of the local Community Colleges architecturally related programs.
2. The College will work with the Boulder campus leadership to develop a space plan necessary to accommodate the undergraduate program program.

3. In Fall 2009, the College intends to start a new 4 year Bachelor of Arts in Architecture, followed by an accelerated 1 ½ year Master of Architecture at the Denver campus.
4. It is anticipated that the new Denver program will admit approximately 30 students per year. This cohort of 30 students will include two sections of architectural design studio (where the students are assigned a drawing desk 24/7 for the semester). Adding this number of students to the program each year accumulates to roughly 140-170 students over the 5 and 1/2 years that students would be in this accelerated 5 1/2 year degree (4 year B.A. In Architecture, 1 1/2 year Master's degree required for licensure). The proposed new BA Arch Sci and 1.5 yr M.Arch enrollment numbers should be considered 'draft' and are subject to change pending a degree proposal submitted to Board of Regents.

The overall enrollment picture for the College looks like this:

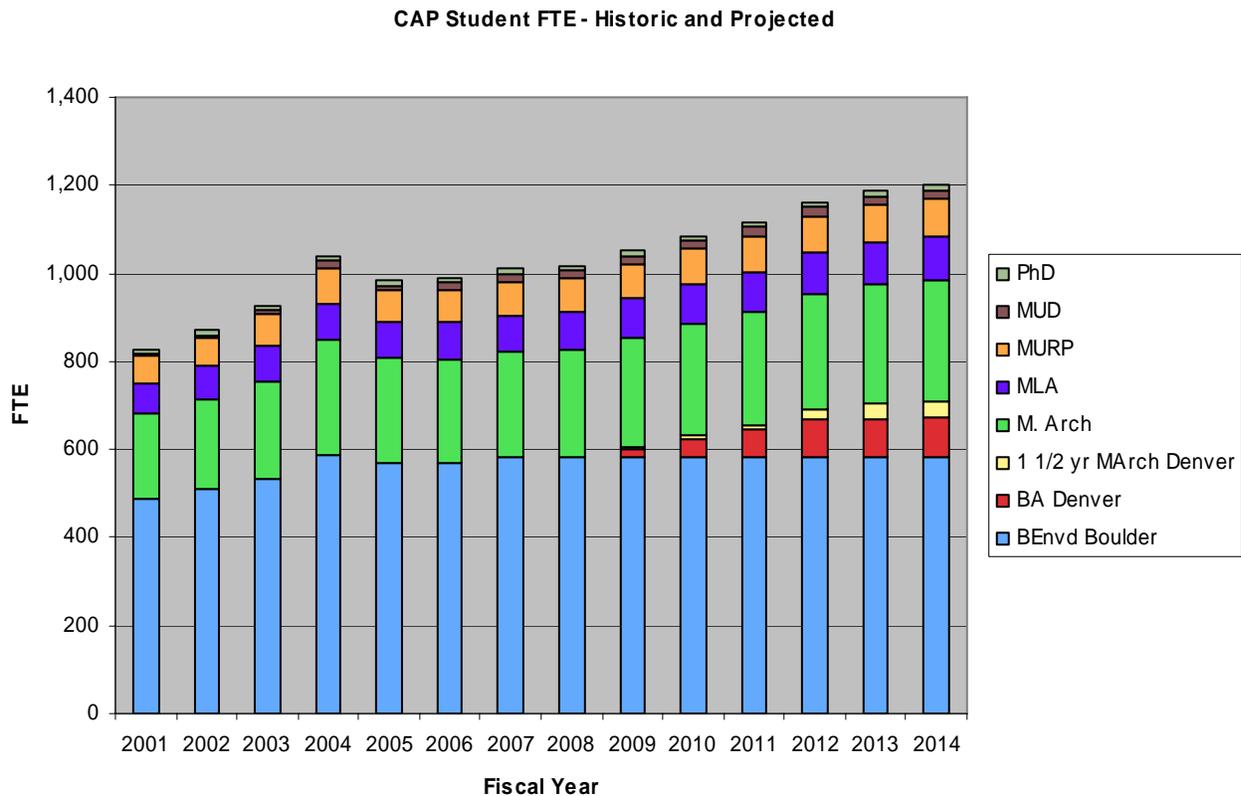


Figure 16: CAP Historic and Projected FTES

On the following pages can be found numeric data on the historic and projected FTES and accompanying FTEF for the College:

# College of Architecture and Planning – Student FTE and Headcount – Year 2002 – 2014

Table 4 - Student FTE – 2002 – 2014

Student FTES - Fiscal Year

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BEnvd Boulder	488.4	508.9	532.3	588.1	566.8	570.8	582.2	582.2	582.2	582.2	582.2	582.2	582.2	582.2
BA Denver									19.8	40.1	62.3	85.2	87.6	90.0
1 1/2 yr MArch Denver									4.3	8.6	8.6	22.2	36.8	38.5
M. Arch	193.9	205.7	223.8	262.2	240.1	233.3	238.0	242.7	247.6	252.5	257.6	262.7	268.0	273.3
MLA	69.0	76.4	77.6	78.7	80.7	83.5	85.2	86.9	88.6	90.4	92.2	94.0	95.9	97.8
MURP	61.1	63.2	72.2	82.1	74.4	75.3	76.8	78.3	79.9	81.5	83.1	84.8	86.5	88.2
MUD	4.6	4.9	9.7	17.2	11.0	16.6	16.9	17.3	17.6	18.0	18.3	18.7	19.1	19.4
PhD	8.7	10.7	10.4	8.5	10.2	10.2	10.4	10.6	10.8	11.0	11.3	11.5	11.7	12.0
Denver total	337.3	360.9	393.7	448.7	416.4	418.9	427.3	435.8	468.6	502.0	533.3	579.1	605.5	619.3
College total	826	870	926	1,037	983	990	1,009	1,018	1,051	1,084	1,116	1,161	1,188	1,201

Student Headcount - Fall of Year Shown

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BEnvd Boulder	726.0	809.0	854.0	885.0	841.0	840.0	852.0	852.0	852.0	852.0	852.0	852.0	852.0	852.0
BA Denver									30.0	60.6	94.2	128.8	132.5	136.1
1 1/2 yr MArch Denver									5.0	10.0	10.0	26.0	43.0	45.0
M. Arch	225.0	234.0	238.0	283.0	257.0	269.0	279.0	284.6	290.3	296.1	302.0	308.0	314.2	320.5
MLA	62.0	74.0	80.0	82.0	80.0	83.0	95.0	96.9	98.8	100.8	102.8	104.9	107.0	109.1
MURP	82.0	78.0	88.0	115.0	108.0	109.0	103.0	105.1	107.2	109.3	111.5	113.7	116.0	118.3
MUD	4.0	4.0	4.0	9.0	9.0	5.0	6.0	6.1	6.2	6.4	6.5	6.6	6.8	6.9
PhD	27.0	31.0	31.0	28.0	31.0	35.0	31.0	31.6	32.3	32.9	33.6	34.2	34.9	35.6
Denver total	400.0	421.0	441.0	517.0	485.0	501.0	514.0	524.3	569.8	616.1	660.6	722.3	754.3	771.5
College total	1,126.0	1,230.0	1,295.0	1,402.0	1,326.0	1,341.0	1,366.0	1,376.3	1,421.8	1,468.1	1,512.6	1,574.3	1,606.3	1,623.5

Table 5- Faculty FTE – 2002- 2014

Faculty FTEF

Historic Faculty/Student Ratios

undergrad	25.3	22.6	24.9	21.5	19.8	20.0	19.0	Average	21.9	Assume	21
graduate	9.3	9.4	10.9	11.2	9.7	9.7	9.3		9.9		10.0

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BEnvd Boulder	19.3	22.5	21.4	27.3	28.6	28.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6	30.6
BA Denver									0.2	0.5	0.5	1.2	2.0	2.1
1 1/2 yr MArch Denver									0.4	0.9	0.9	2.2	3.7	3.8
Grad Denver	36.1	38.3	36.0	40.0	43.1	43.1	46.1	43.6	44.5	45.3	46.2	47.2	48.1	49.1
Denver total	36.1	38.3	36.0	40.0	43.1	43.1	46.1	43.6	45.1	46.7	47.6	50.6	53.8	55.1
College total	55.4	60.8	57.4	67.3	71.7	71.7	76.7	74.2	75.7	77.3	78.2	81.2	84.4	85.7

Faculty Headcount

Historic ratio total headcount to total FTEF

	2.30	2.32	2.15	2.25	2.10	Average	2.22
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Historic ratio percent of total FTEF

Ten/TenTrk	0.26	0.17	0.17	0.17	0.20	0.20
Inst/SenInst	0.08	0.06	0.10	0.15	0.13	0.10
Lecturer	0.36	0.39	0.35	0.33	0.32	0.35
Other	0.31	0.38	0.38	0.35	0.35	0.35

headcount of faculty types = % type is of total FTEF X historic ratio of headcount to FTEF

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ten/TenTrk			34	27	26	28	33	32.3	32.9	33.6	34.0	35.3	36.7	37.2
Inst/SenInst			10	9	15	24	21	16.8	17.2	17.5	17.7	18.4	19.2	19.4
Lecturer			47	61	54	53	51	57.5	58.7	59.9	60.6	63.0	65.4	66.4
Other			41	59	59	56	56	58.3	59.5	60.7	61.4	63.8	66.3	67.3
Total			132	156	154	167	167	164.8	168.2	171.7	173.7	180.5	187.6	190.4

### 3. Changes in Pedagogy

Design and planning education historically and nationally has always relied more than most other College programs on hands-on, project-based student work. Students learn their skills largely through practicing design and planning in projects assigned in design studios. Each student is traditionally given a drawing board 24/7 in a dedicated space, where the teachers regularly review and discuss their evolving design ideas. This need for a dedicated desk is what drives the space needs for the College, because studio spaces cannot accommodate multiple sections of students. Every new student needs dedicated space for the semester.

Both in the College and nationally, the trend to project-based student work is increasing. There is more emphasis than ever before on learning in labs and less on learning in formal lectures. Dramatic changes in the professions are driving this:

1. The professions now rely on powerful new visualization technologies, including digital applications that can precisely model and specify the three-dimensional construction of a building or landscape in virtual space and time. Students must understand construction in order to manage the design and visualization process in this new environment, and all must be developed together while developing new design ideas.
2. The design professions will increasingly have to understand and manage rapid prototyping, in which a conceptual design represented in a digital model can be sent to fabricating machines that test the design concepts at an early stage. This involves the use of CNC routers, 3-D printers and laser cutters, among other technologies, testing students' designs as they evolve.
3. Because the new technologies require a deep understanding of construction in order to build the new three dimensional computer models, students need more experience with construction, by undertaking design/build projects like the award-winning Solar Decathlon projects.
4. Students must urgently learn how to work in multi-disciplinary teams, while working on real projects.

These developments present promising opportunities for new ways of thinking about integrated relationships among complex environmental problems – form, design, economics, construction, urban and regional ecology, global development, transportation, and community health – with seismic consequences for all professions and disciplines represented by the College.

The proposed College of Architecture and Planning building will support an entirely new concept of educational interaction based on new community formations, rapid access to information, rapid prototyping, interdisciplinary repertoires, and radical flexibility in the organization and administration of teaching and research initiatives. It will increase the competitiveness and productivity of both students and faculty.

This vision of the twenty-first century college directly supports another aim of unique interest to CAP's disciplines: the design and construction of a highly sustainable building package, from thermal envelope to wall outlet. The University of Colorado will greatly amplify its leadership in sustainable design and technology, and vividly project its commitment to a broad, international constituency. The new building for the College of Architecture and Planning will provide a flexible learning environment that will foster collaboration and shared value through the design of open and interconnected spaces for classes, lectures, studios, discussions and meetings. The flexible space and building will facilitate the exchange of creative thought and design; be a manifestation of what occurs inside; be a demonstration of sustainable design and systems; support a sense of community within the College; and be a resource to the design and construction industry throughout Colorado.

## C. Total Space Requirements

### 1. Planned Program Space Utilization

National guidelines and existing program operations helped provide the space requirements for the College. These were developed based upon the program and operational requirements of the activities to be carried out in the spaces and mandated by the rules and regulations that apply to the program relative to accreditation requirements. These needs, in conjunction with the program assumptions and space standards listed below, informed the total space requirements listed in this section.

The College estimates that it will require approximately 77,912 ASF at the Denver campus location to meet its graduate academic and research program needs by the year 2014. This represents an increase of approximately 21,508 ASF (43.1%) over the current Denver campus inventory. A comparison of existing space by space type to projected space is provided below.

Table 6 – Projected ASF Requirements by Space Type

Space Type	Current ASF 2007	%	Projected ASF Need 2014	%	Variance	% Increase
Classroom/Conference	6,438	12.9%	7,380	9.5%	942	14.6%
Instructional Laboratories	4,603	9.2%	9,590	12.3%	4,987	108.3%
Studio	24,520	49.1%	38,000	48.8%	13,480	55.0%
Exhibition	1,877	3.8%	6,400	8.2%	4,523	241.0%
Faculty offices	4,514	9.0%	8,540	11.0%	4,026	89.2%
Admin offices & Staff	4,403	8.8%	3,620	4.6%	-783	-17.8%
Centers	2,188	4.4%	2,750	3.5%	562	25.7%
Student offices, lounge	1,361	2.7%	1,632	2.1%	271	19.9%
<b>Totals</b>	<b>49,904</b>		<b>77,912</b>		<b>21,508</b>	<b>43.1%</b>

## Current Yr 2007 and Projected Yr 2014 Space Needs (ASF)

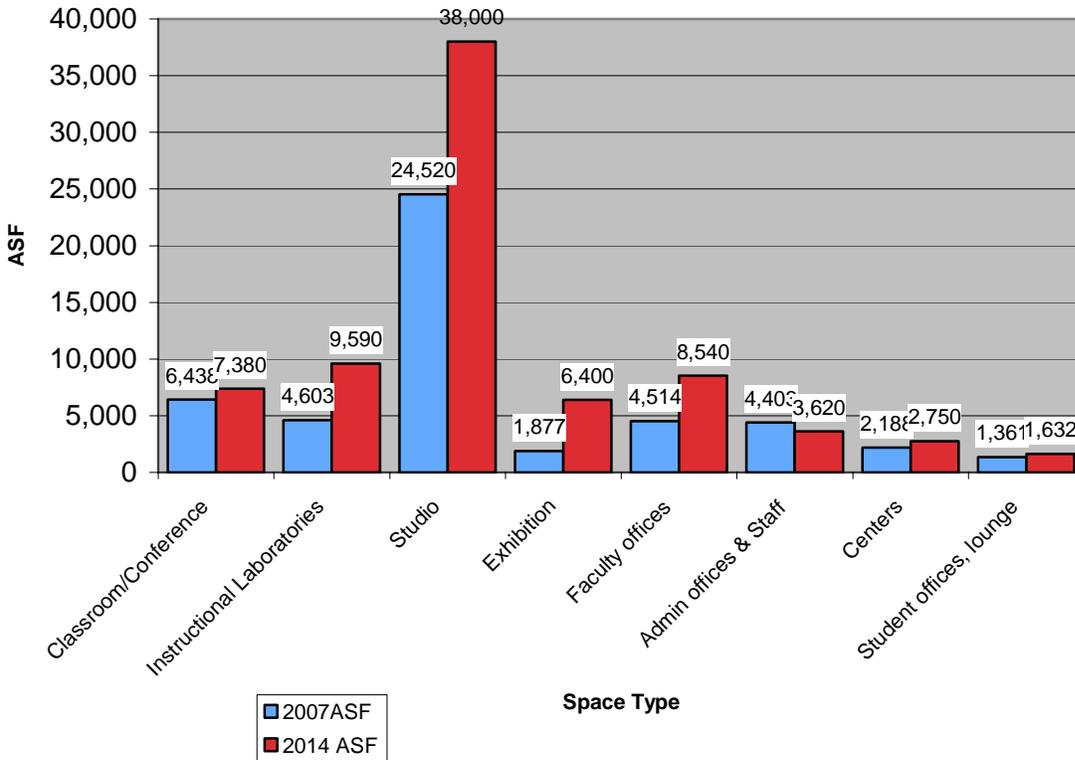


Figure 17: Current and Proposed ASF by Space Type

## 2. Space Planning Assumptions

The program for the CAP Building includes space for classrooms and studio space, visualization/computer and prototyping laboratories, faculty and administrative offices, student activities space, and common area and building support space. The following assumptions/guidelines were utilized to estimate space needs:

### Design Studios (Learning Labs)

#### Assumptions:

1. Each student is assigned a desk 24/7 for the semester; so no multiple sections using the same space
2. Historic Ratio of students in studio as proportion of total FTES  
Undergraduate: .63  
Graduate: .98
3. Assume 15 students per studio per semester
4. Total number of studios each semester is total studio population / 15 rounded up to next full integer

Table 7 –Design Studios Required

**Sections Needed:**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BA Denver									1	2	3	4	4	4
1 1/2 yr MArch Denver									1	1	1	2	3	3
Grad Denver	25	26	27	32	30	31	32	33	33	34	35	35	36	37
<b>Denver total</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>32</b>	<b>30</b>	<b>31</b>	<b>32</b>	<b>33</b>	<b>35</b>	<b>37</b>	<b>39</b>	<b>41</b>	<b>43</b>	<b>44</b>

**Studio Space Required:**

Accreditation requires 50 sf per student in studios

Total studio space = no. sections X no. students per section X 50 sf per student:

**At final buildout in 2014, Denver will require 44 sections X 15 students per section X 50 sf:**

**33,000 asf**

**ASF Needed for Studios:**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BA Denver	-	-	-	-	-	-	-	-	750	1,500	2,250	3,000	3,000	3,000
1 1/2 yr MArch Denver	-	-	-	-	-	-	-	-	750	750	750	1,500	2,250	2,250
Grad Denver	18,750	19,500	20,250	24,000	22,500	23,250	24,000	24,750	24,750	25,500	26,250	26,250	27,000	27,750
<b>Denver total</b>	<b>18,750</b>	<b>19,500</b>	<b>20,250</b>	<b>24,000</b>	<b>22,500</b>	<b>23,250</b>	<b>24,000</b>	<b>24,750</b>	<b>26,250</b>	<b>27,750</b>	<b>29,250</b>	<b>30,750</b>	<b>32,250</b>	<b>33,000</b>

**Pin-up Space Required:**

*Assumptions:*

Besides space for drawing boards and desks in the design studios, design education requires spaces where students in a studio section can periodically present their drawings and models for public discussion and critique. This process occurs periodically throughout the semester during studio class times, and intensively at the middle and end of semesters. These spaces could either be attached to the studio spaces, or in public spaces like exhibit areas, or in classrooms. The important need is for wall space for pinning up drawings, for projectors for digital presentations, and for sufficient space for a group of 20 (15 students, 5 jurors) to sit and view one wall. A 20 student classroom is a good model for the space need.

The most intensive need for these spaces is at the end of the semester, when all studios must present work in one week, for about 4 hours each group.

Each pin-up space could be used 10 times (morning and afternoon for 5 days).

Number of studio sections / 10 = number of pin-up spaces required:

Each space = 50 asf per person X 20 students = 1,000 asf.

**Total space = 1,000 asf x number of spaces = 5,000 asf.**

**Denver Classrooms Required**

*Assumptions:*

1. The College teaches in two patterns: 3 hr classes one day a week, and 1 1/2 hr classes 2 days a week.
2. Fridays are kept free for meetings and research, so classes are taught M T W Th.
3. Total number of classes that can be taught in any given classroom: 4 classes each morning, afternoon and evening = 4 X 3 = 12 classes per room per week.

*The following calculations combine the Denver 5 1/2 Master's and traditional Master's FTES*

### Large Classes (50-120 students)

The large lecture population in any given semester = .93 of the FTES  
 Total population of large lectures each semester is:

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	314	336	366	417	387	390	397	405	436	467	496	539	563	576
7 separate classes of large lectures are required in the curriculum, so the av. number of students per section is:														
	45	48	52	60	55	56	57	58	62	67	71	77	80	82

However, due to curricular timing and sequencing, the maximum size is sometimes 90 at present; this could go to 120 with the new degree. This need could be met with a raked seating lecture hall of 150 seats.

<b>Total space = 150 seats X 20 sf per seat =</b>	<b>3,000 asf</b>
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### Medium Classes (21-50 students)

The medium lecture population in any given semester = 1.08 of the FTES  
 Total population of medium lectures each semester is:

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	364	390	425	485	450	452	461	471	506	542	576	625	654	669

The historic average size of class is 33 students per section, so the number of sections is:

	11	12	13	15	14	14	14	14	15	16	17	19	20	20
--	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Since 1 classroom can only be used 12 times a week, the number of medium rooms required is:

	1	1	2	2	2	2	2	2	2	2	2	2	2	2
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---

<b>Total space = 2 classrooms X 50 seats X 21 sf/seat =</b>	<b>2,100 asf</b>
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### Small Classes (less than 20 students)

The small lecture population in any given semester = 1.03 of the FTES  
 Total population of graduate small lectures each semester is:

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	347	372	406	462	429	431	440	449	483	517	549	597	624	638

The historic average size of class is 16 students, so the number of sections is:

	22	23	25	29	27	27	28	28	30	32	34	37	39	40
--	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Since each classroom can accommodate 12 sections per week, the total number of small classrooms is:

	2	2	3	3	3	3	3	3	3	3	3	4	4	4
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<b>Total space = 4 classroom X 20 seats X 21 sf/seat +</b>	<b>1,680 asf</b>
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## Offices

- Office counts match projected faculty and staff headcounts including growth.
- Standard faculty and staff office is 120 ASF
- Departmental consolidation of offices is preferred to foster collaboration.
- Adjacency of faculty offices to studios is preferred option. Office locations should support convenient access of students to faculty.

## Meeting rooms and community space

- Conference rooms within the building will be located to support interaction and institutional identity.
- Community space within the building will be located to support interaction and institutional identity.

## Receiving and Support

- Storage is modeled to meet declared need.
- Storage spaces will be provided for important collections and equipment.

### 3. Total Space Requirements

A listing of space requirements for the new building is provided in the following table

Table 8 –CAP New Building Space Plan

**College of Planning and Architecture  
New Denver Building Space Plan**

	#	ASF/ Room	Total		Total ASF	ASF> DGSF	DGSF	BGSF
<b>Common Areas</b>								
Lobby	1	1,000	1,000					
Exhibition Gallery/Multi-Function Space	1	3,000	3,000					
Storage (Seating/Tables/Display/Exhibit Cases, etc.)	1	400	400					
Quiet Lounge (Tables, Soft Seating)	1	1,000	1,000					50 seats @ 20 asf/seat
Café/Canteen (including seating, tables, servery, prep & storage)	1	1,000	1,000					
<b>Total Common Areas</b>					<b>6,400</b>	1.2	<b>7,680</b>	
<b>Administration Office</b>								
Reception Area/Visitor Seating	1	600	600					# seating @ 40)
Receptionist Desk	1	80	80					
Dean's Office	1	300	300					
Assistant to the Dean	1	120	120					
Associate Dean Office (2 @ 200)	2	200	400					
Assistant Dean Office (2 @ 150)	2	150	300					
Staff Offices (10 @ 120)	10	120	1,200					
Copy/Supplies	1	120	120					
Coffee/Kitchen	1	200	200					
Storage/Files	1	300	300					
<b>Total Administration</b>					<b>3,620</b>	1.3	<b>4,706</b>	
<b>Instructional and Academic Support Space</b>								
<b>Classroom Space</b>								
Conference Room	1	600	600					# seating @ 40)) 20 asf/seat  20 asf/seat  20 asf per seat - Sloped Floor, Fixed Seat, Audio/Visual Projection
Small Rooms (4- 20 Seats @ 420 sf ea)	4	420	1,680					
Medium Classrooms (2- 50 seats @ 1050 ea)	2	1,050	2,100					
Main Lecture Hall / 150 seats	1	3,000	3,000					
<b>Subtotal Classroom Space</b>				<b>7,380</b>		1.3	<b>9,594</b>	
<b>Studio Space</b>								
Pin-up Spaces ( 5 @ 1000 sf each)	4	500	2,000					Additional from space efficiencies in design
Studios (42 Sections @ 15 Students/50 sf/student)	42	750	31,500					
<b>Subtotal Studio Space</b>				<b>33,500</b>		1.2	<b>40,200</b>	

<b>Visualization/Computer Center Lab Space</b>	1	4,000	4,000				
Printing/Plotting							
Lab Manager							
Lab Assistants							
Server Room							
Storage							
Visual Resource Center							
Printing Plotting Space							
Supplies/Storage							
Archive Project Storage							
<b>Subtotal Visualization Lab</b>				<b>4,000</b>		1.3	<b>5,200</b>
<b>Prototyping Lab</b>	1						
Wood/Plastics/Metal Shop	1	5,000	5,000				
Shop Manager	1	120	120				
Shop Assistants (2@ 60)	1	120	120				
Supply Storage	1	150	150				
Spray Booth	1	200	200				
<b>Subtotal Wood/Plastics/Metal Shop</b>				<b>5,590</b>		1.3	<b>7,267</b>
<b>Faculty Offices</b>							
Department Chairs ( 4 @ 200 sf)	4	200	800				
Assoc Chairs (3 @ 150 sf)	3	150	450				
Individual Faculty Offices (42 @ 120)	42	120	5,040				
Share Office Space (75 Lecturers / 5 per room @ 150 sf per room)	15	150	2,250				
<b>Subtotal Faculty Offices</b>				<b>8,540</b>		1.3	<b>11,102</b>
<b>Student Activities Space</b>							
American Institute of Architecture Students (AIAS)	1	120	120				
American Planning Association for Students (APAS)	1	120	120				
American Society of Landscape Architecture Students (ASLAS)	1	120	120				
Lounge / Seating / Reading/Meeting	1	1,000	1,000				
<b>Subtotal Student Activities</b>				<b>1,360</b>		1.2	<b>1,632</b>
<b>Research Centers</b>							
Student Interns/ PhD students	1	1,000	1,000				
Staff/ Offices	1	800	800				
Workspace	1	950	950				
<b>Subtotal Research Centers</b>				<b>2,750</b>		1.2	<b>3,300</b>
<b>Total Instructional and Academic Support</b>					<b>63,120</b>		<b>78,295</b>
<b>Building Support</b>							
Building Storage	1	600	600				
Loading Dock and Trash	1	1,000	1,000				
Interior Staging Area	1	600	600				
<b>Total Building Support</b>					<b>2,200</b>	1.1	<b>2,420</b>
<b>Total ASF</b>					<b>75,340</b>		
<b>Total DGSF</b>							<b>93,101</b>

Total BGSF - Conversion Factor DGSF->BGSF:1.3

120,000

ASF/GSF Efficiency

62.8%

#### 4. Specialized Space Requirements

The new facility will include two specialized laboratories – a visualization laboratory and prototype laboratory.

##### **Visualization Laboratory (4,000 ASF)**

The College believes that giving students full immersion in the latest visualization technologies gives them freedom to explore their designs from every aspect as they develop. Design, planning, modeling and animation, and virtual reality programming will be offered in the Visualization Laboratory. Studies are integrated into the design studio so that students learn and apply technical knowledge within the context of their own design projects. The 4,000 ASF visualization laboratory will provide a multidisciplinary studio for the study and application of projection based virtual reality/visualization techniques for research and teaching in the architecture, planning and design arts. The lab will provide access to two- and three-dimensional computer aided design and modeling software, digital manufacturing software, and programs for animation, image processing and graphical layout. The lab will provide students and faculty with input and output devices that include wide-format, flatbed, and 3D scanners and various high-quality, large-format color plotter devices.

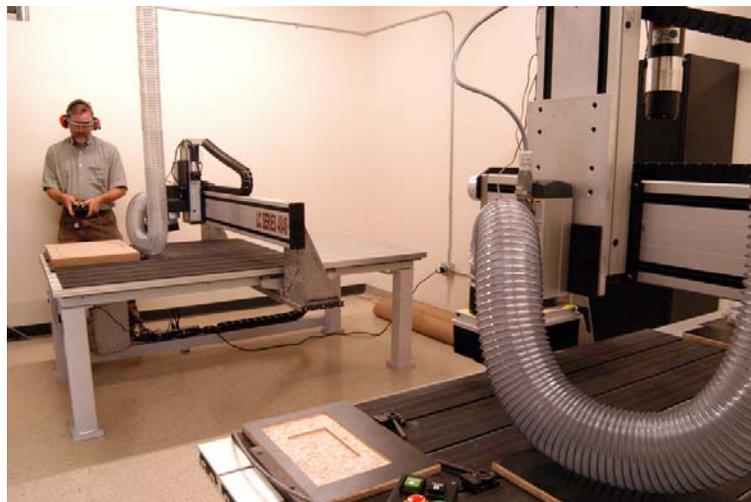


*Figure 18: Visualization Lab in the CAP Boulder facility*

##### **Prototype Laboratory (5,000 ASF)**

The impact of digital information has had profound effect on contemporary architectural production. The prototype laboratory will be an evolving production facility which houses the latest technologies as well as more traditional tools used for exploration, modeling and fabrication. Full access and studio integration allows students to utilize the most current technologies as both a design aid and also full scale prototyping of the design proposals. As new technologies emerge and allow for even greater architectural possibilities, the School of Architecture will continue to equip the laboratory with this latest technology, including CNC routers, 3-D printers and laser cutters. The facility will include a wood, plastics and metal shop. The laboratory will provide a setting for students to explore the process of designing

and creating handmade objects. The laboratory will be nearly 5,000 square feet in size with large machine and assembly space, tool and material storage areas, project storage areas, staff support offices, library, and an adjacent pin-up area for design review.



*Figures 19A and B: Prototyping Lab in the CAP Boulder facility*

### **D. Alternative Analysis**

Several alternatives to the proposed facility for the College of Architecture and Planning have been evaluated. None are acceptable. The unacceptable alternatives involve additional cost, require unworkable programmatic adjustments by the College and the University, or untenable compromise to the mission and vision of the College.

As documented in both the UCD Academic Master Plan (March 2007) and the 2007 Auraria Master Plan, new, flexibly designed academic space is necessary to meet the program requirements of the University of Colorado College of Architecture and Planning. The alternatives for this project request include:

**1. Construct the College on a Different Denver Site:**

Although other sites for the College of Architecture and Planning have been considered, the Auraria campus site is one of only two sites that combine the two principal desired characteristics-proximity to downtown and proximity to the Auraria Campus. The other site which features these characteristics is the under-developed portion of the CU-Denver Building (1250 14th Street). However, there are a number of complexities related to that site (small footprint, considerable demolition cost, and cost of connecting to the existing tower) that make it less desirable and more costly than the site being considered in this request.

**2. Lease a Facility/Space:**

An alternative to this new building project involves the use of leased space in a proximate location to house various program elements. This option will result in the further fragmentation of the College programs and result in additional operational costs.

**3. Continue to Operate in Existing Facility**

The current program delivery and future growth in the college would be impeded under this option.

### **III. Implementation and Design Criteria**

#### **A. Assumptions/Guidelines**

##### **1. Vision for the New Building**

The new building will provide a flexible learning environment that will foster collaboration and shared value through the design of open and interconnected spaces for classes, lectures, studios, discussions and meetings. The flexible space and building will facilitate the exchange of creative thought and design; be a manifestation of what occurs inside; be a demonstration of sustainable design and systems; support a sense of community within the College; and be a resource to the design and construction industry throughout Colorado. The new facility will be an innovative building designed to support the concept of flexible 'learning community'.

##### **2. Planning Assumptions**

Initial discussion with the project oversight committee/working group resulted in the following list of assumptions/guidelines for further consideration through the concept design phases of the project.

- Initial planning scope assumption for building – 120,000 GSF @ \$42 million. The investment will provide state-of-the-art design studios, lecture and classrooms, instructional laboratories and seminar space; public gallery space; the means to attract practitioners and researchers of national and international reputation.
- Building will be sited on the Auraria campus – within/ adjacent to UCD neighborhood zone.
- Tentative Project Schedule:
  - Project Design: July 2008 – June 2009
  - Core/Shell Construction: July 2009 – June 2010
  - Finish/Equip: July 2010 – June 2011
  - Occupancy: July 2011
- The building will be designed to be a center of activity and accessible 24 hours a day. The building will provide a world class facility for the CAP curriculum but will also create a new stage for events and place of vibrancy for the private/public AHEC zone.
- The building will provide a flexible environment that will foster collaboration through a design of open and interconnected spaces for casual meetings, discussions, formal classes, lectures, and studios. Space needs to be open, flexible and reconfigurable. Building and space will be adaptable/interchangeable/self-sufficient.
- Building must promote community – cannot neglect social interaction – provide variety of spaces/places to go for faculty/student interaction.
- Building design should promote uniqueness and identity of College.

- Promotes 'quality of life' for students. Building needs to be a 24-hr facility for students and therefore include adequate amenities such as restrooms with locker rooms.
- Facility/space design will allow for the breakdown of academic discipline barriers. Building should promote experimentation and open faculty and student exchange. Space could possibly be organized around themes of College. Interaction spaces within building will allow for the breakdown of graduate/undergraduate student silos.
- The 120,000 square foot facility will employ numerous sustainable strategies in an integrated design. The building will adapt to seasonal variations, provide flexibility in space configurations, and accommodate changes in technology. The design will be based upon human needs and ergonomics. Building will feature extensive day-lighting.
- Site will be designed to accommodate an exterior yard area to accommodate prototyping laboratory, landscape architecture and various exterior project activity.
- The building will be designed and sited to accommodate future expansion – vertical and horizontal options need to be reflected in the design.
- The building is to be considered a didactic teaching tool for students to learn about design and building technology, especially sustainable concepts. The building will promote a higher quality of life, creating a special place that inspires creative problem-solving as well as appreciation for resources, both natural and man-made, which shape the built environment. All spaces should be open and interactive.
- Healthy building for those who work in it, including Universal Design for accessibility for disabled users.
- Building must be smart building – demonstrating how technology can be integrated into space and building design.
- Facility should be a great work of architecture – a center for professions – both academic and professional. The building needs to be great urban building – accommodating flexible mixed use.
- Building will be major gateway to campus.
- Building should be 'iconic' and very interesting. – “Space of Encounter”. Design the building /space as 3-dimensional building – not as a singular, inflexible modular type building. Think of building as “Rubic’s cube” – can be shifted around – not one defined geometry. Building is a show room from all elevations – including rooftops.
- Facility must connect back to the construction industry including demonstration place for building materials.
- Design must accommodate proper balance between open/transparent and safe/secure.
- Building should be inviting and nurturing – integrative, and collegial.

- Parking for the facility will be provided by the Auraria Higher Education Center in existing facilities with surplus capacity. The facility will acknowledge the increased access provided by Light Rail and FasTracks.
- The design of the facility will encourage interaction among the faculty and among students, administrators, faculty and staff, and the professional community by creating space to gather and build community.
- The siting and construction of the CAP building will support the mission of the College and UCD
- The building will capitalize on inter-institutional synergies while recognizing Auraria institutions as colleagues sharing a campus.
- Spaces will provide flexibility to meld disciplines by accommodating growth, change, and evolution towards unforeseen pedagogy.
- Without compromising safety, the building will make an architectural statement about the importance of science to the campus, city, and beyond.
- CAP will reinforce institutional and college identities that support effective way finding.
- Ongoing master planning efforts suggest the new architecture and planning building will create opportunities to support public/private partnership on the Auraria campus including incubator and non-profit space.
- The building will capitalize on Auraria efficiencies and shared resources.
- Sustainability and sophistication of building systems should be balanced to ensure maintainability/reliability. This building must display to the world the state of the art in sustainability; it should be a model of how a large public building can rely on natural sources of heating, cooling and lighting, reduce water usage, and give energy back to the grid.
- Because the facility will be on a prominent public edge of an intensively used, urban campus, after-hours visibility and security of studio and student space is a critical concern.
- Top tier technology for academics will ensure the best education for students. The facility will be a faculty recruitment tool with the technology to support international collaboration.
- CU-Denver building backfill space will be vacated by CAP programs to be relocated into the new CAP Building project – this space will be used for other UCD campus priorities. Cost for backfill space renovation in CU Denver building is not included in CAP project costs.
- To further the connections to other design colleges and other regions of the world dealing with similar issues, the new building will need extensive tele-conferencing and tele-designing facilities (virtual design teams from around the world working digitally on the same project).

## ***B. Spatial Relationships/Diagrams***

The building will bring CAP programs and centers together in a flexible learning community environment, which will foster collaboration and shared value through the design of open and interconnected spaces for casual meetings, discussions, formal classes, lectures, and studios. Learning communities require open, flexible spaces, allowing teams to configure their space according to their planned work. Adjacent to these spaces should be support facilities like prototyping labs, visualization labs, and faculty offices. The program for the building includes integrated studio and critique spaces, faculty and administrative offices, gallery space, computer and visualization labs, classrooms, and prototyping facility. The building and exterior are conceived as teaching tools for future architects, landscape architects and planners to learn about design and building technology, especially sustainable concepts. The new facility will promote a higher quality of life, creating a special place that inspires creative problem-solving as well as appreciation for the resources, both natural and man-made, which shape the built environment.

The flexible and integrative 'learning laboratory' will be the key component/ building block in the design. The laboratory is comprised of flexible studio and support space immediately adjacent to specialized instructional laboratories and faculty offices. The flexible learning laboratory units will be organized/ utilized to support various emerging research and center themes. The learning laboratory allows students to envision, create, and plan, understand needs, and develop concepts. It emphasizes reflection, reinforces interaction and allows easy access to faculty and support laboratory resources. The space allows students to design, and understand interaction; provides opportunities for central and team breakout; and is in proximity to workshop space, reinforcing connection.

The College also requires a large public forum at the heart of the new building, which will bring together faculty, students, practitioners and members of the public for lectures, symposia, workshops, and exhibits. This will be the heart of the design community in Colorado.

Concept diagrams for the Larimer Street site option are presented below.

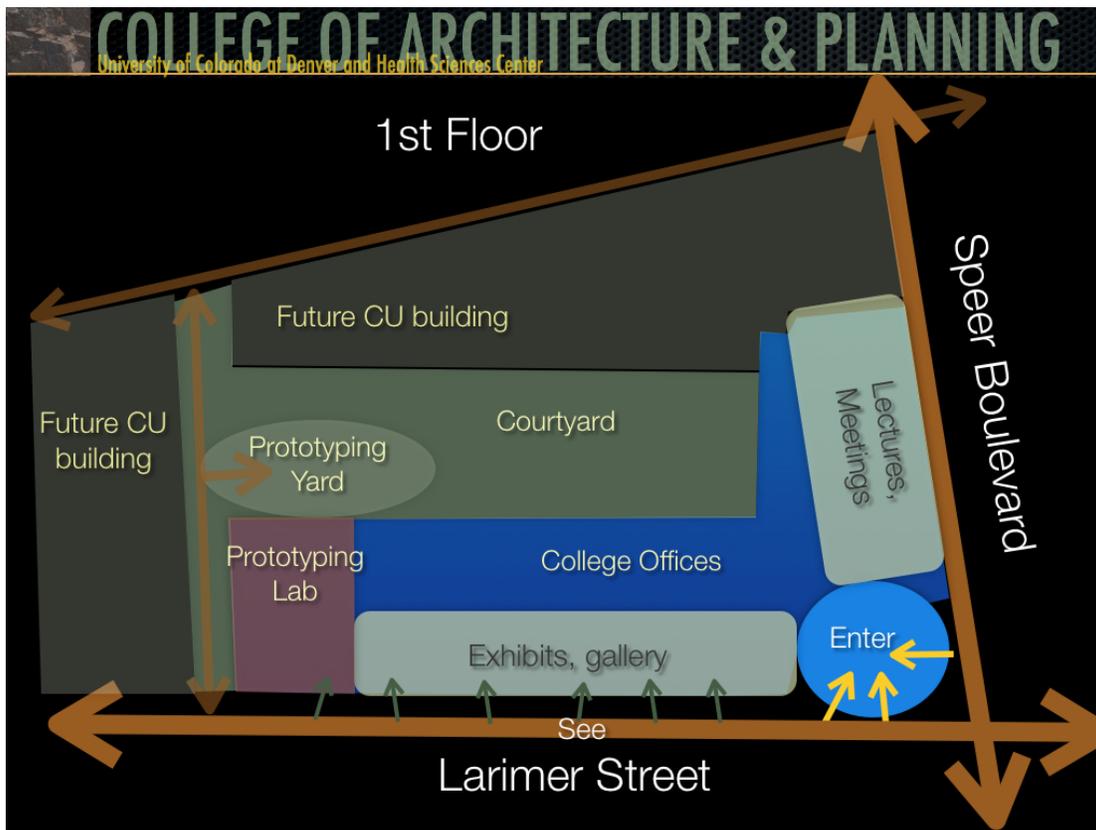


Figure 19A: Adjacencies Diagrams by Floor – Ground Floor

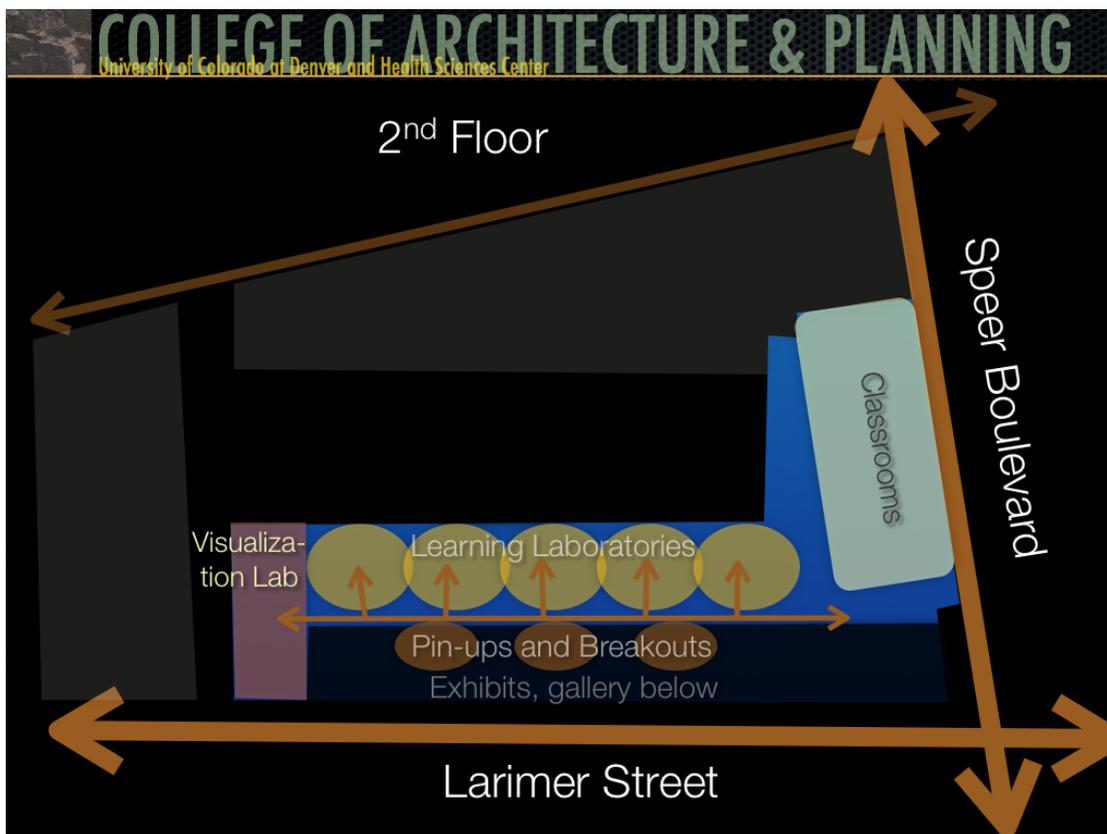


Figure 19B: Adjacencies Diagrams by Floor –Second Floor

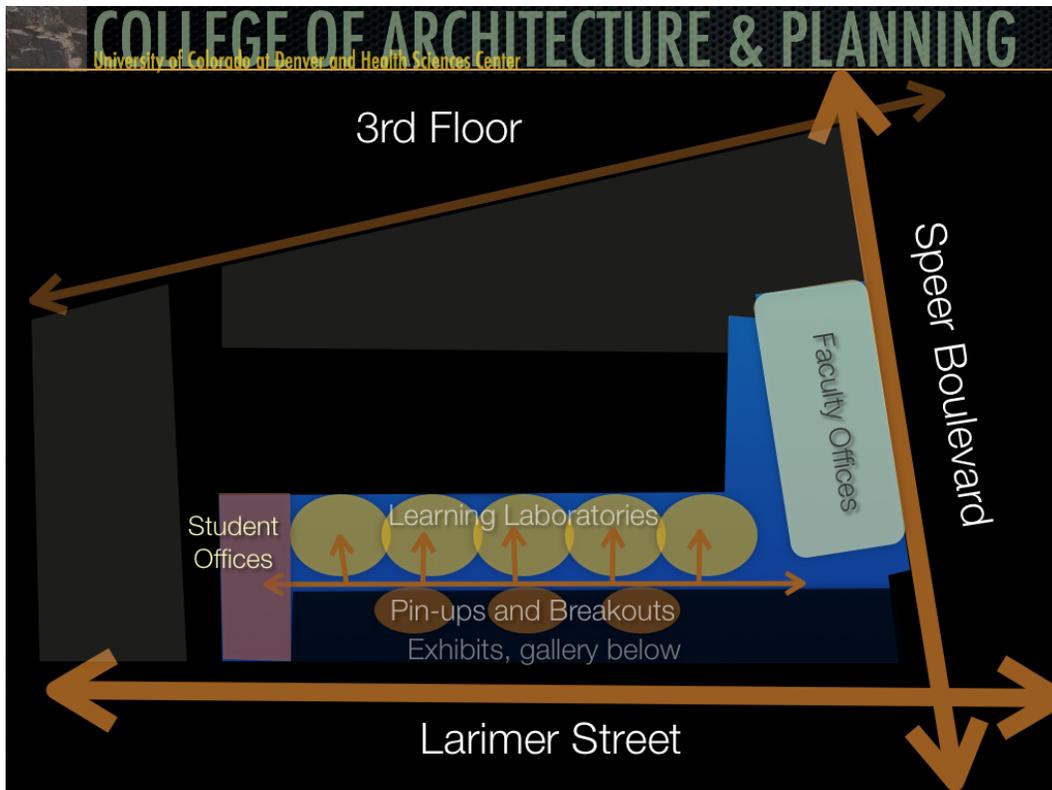


Figure 19C: Adjacencies Diagrams by Floor –Third Floor

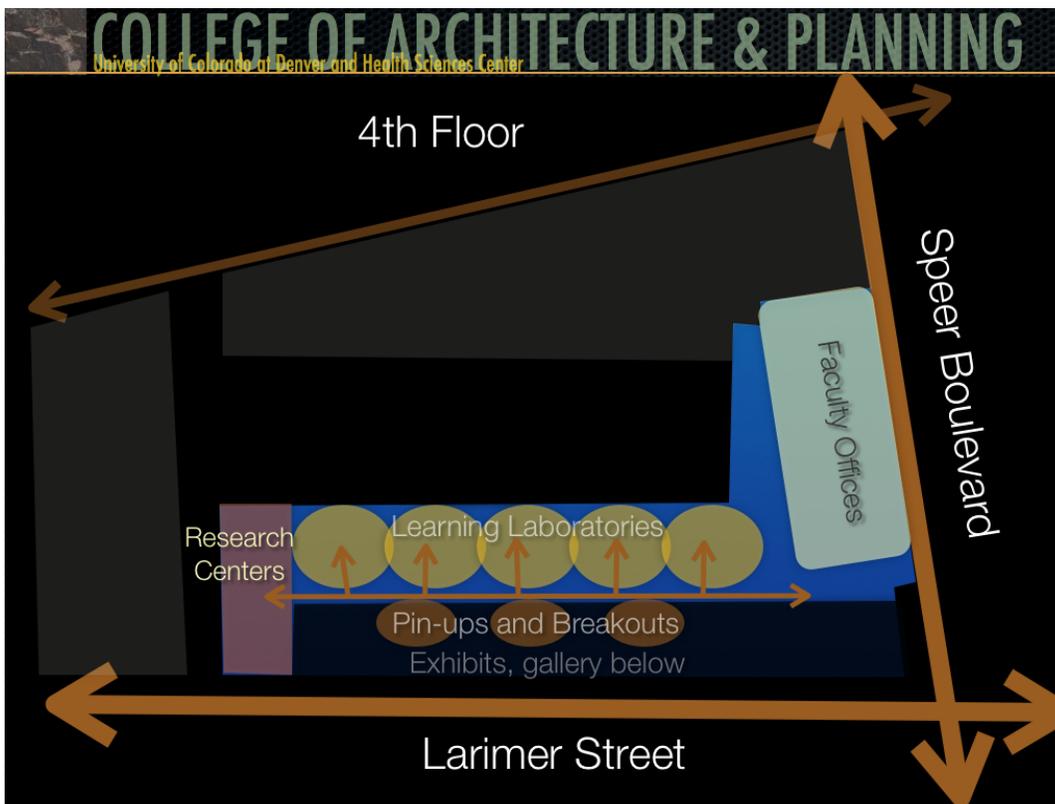


Figure 19D: Adjacencies Diagrams by Floor –Fourth Floor

## **C. Site Requirements and Improvements**

The new building requires an important public location, in order to engage the public and demonstrate the College's work on design and planning issues. The University has selected two site options for the new building at the gateway between lower downtown Denver and the Auraria campus. The new building will become the anchor for public/private development on the north side of the campus. The Larimer Street campus development is projected to bring retail across Speer, and down to a major transit stop in the regional FasTracks light rail system on the west end of the campus. The pedestrian traffic along both Larimer and Arapahoe Streets, and the auto traffic along Speer Boulevard (one of the major routes through the city), will ensure that thousands of people every day will see the important work of the College.

The new building for the College of Architecture and Planning will be located on the Auraria Higher Education Center campus in Denver. The site options include:

**Site 1** Site immediately north of North Classroom building located at the southwest intersection of Larimer Street and Speer Boulevard on the Auraria Higher Education Center campus. The site boundaries are defined by Speer Boulevard on the east, the extension of Larimer Street on the south, the existing AHEC athletic field on the west and Auraria Pkwy on the north. The proposed site currently includes a surface parking lot and athletic fields. The Larimer Street extension at the south perimeter of the site will become one of the campus' most important pedestrian circulation corridors, providing access to a number of campus academic and student support facilities (including the North Classroom, Events Center, Plaza Building, and Performing Arts Center). Larimer Street will also provide connecting walkways to additional important campus buildings and open spaces – including the Tivoli, the King Center and will provide a pedestrian link across Speer Boulevard to both Lawrence Street and Larimer Street in Downtown Denver.

**Site 2** Site immediately east of St. Elizabeth's Church/St. Francis Way and south of Science Building. The site is at the southwest intersection of Arapahoe Street and Speer Boulevard on the Auraria Higher Education Center campus. The site boundaries are defined by Speer Boulevard on the east, the Science Building on the north, St. Francis Way on the west, and Champa Street extension on the south. The proposed site currently includes an open/green space and small surface parking lot. Typical vehicular movement around the site is limited to access from Speer Boulevard via St. Francis Way. At the northeastern edge of the site, the former alignment of Curtis Street also provides a dedicated axial pedestrian walkway providing access to the existing Science Building, St. Elizabeth's Church and across Speer Boulevard to Arapahoe Street in Downtown Denver. An axial view along Arapahoe Street from St. Elizabeth's Church on campus to the D&F Tower on the 16th Street Mall in Downtown Denver defines the northeastern perimeter of the site.

This proposed CAP project development is based upon planning assumptions/guidelines established in the 2007 Auraria Higher Education Center master plan update. Included in the plan is a 5-year implementation strategy advising AHEC on the key steps required to

implement the Master Plan. The additional planning studies and administrative and governance agreements necessary for implementation of the master plan are currently in progress. The impact of these analyses/agreements on the proposed CAP building project and site, including the view corridor analyses, site infrastructure master plan, related site precinct plans, and the Speer Boulevard/ Auraria Parkway study, is still unknown at this time.

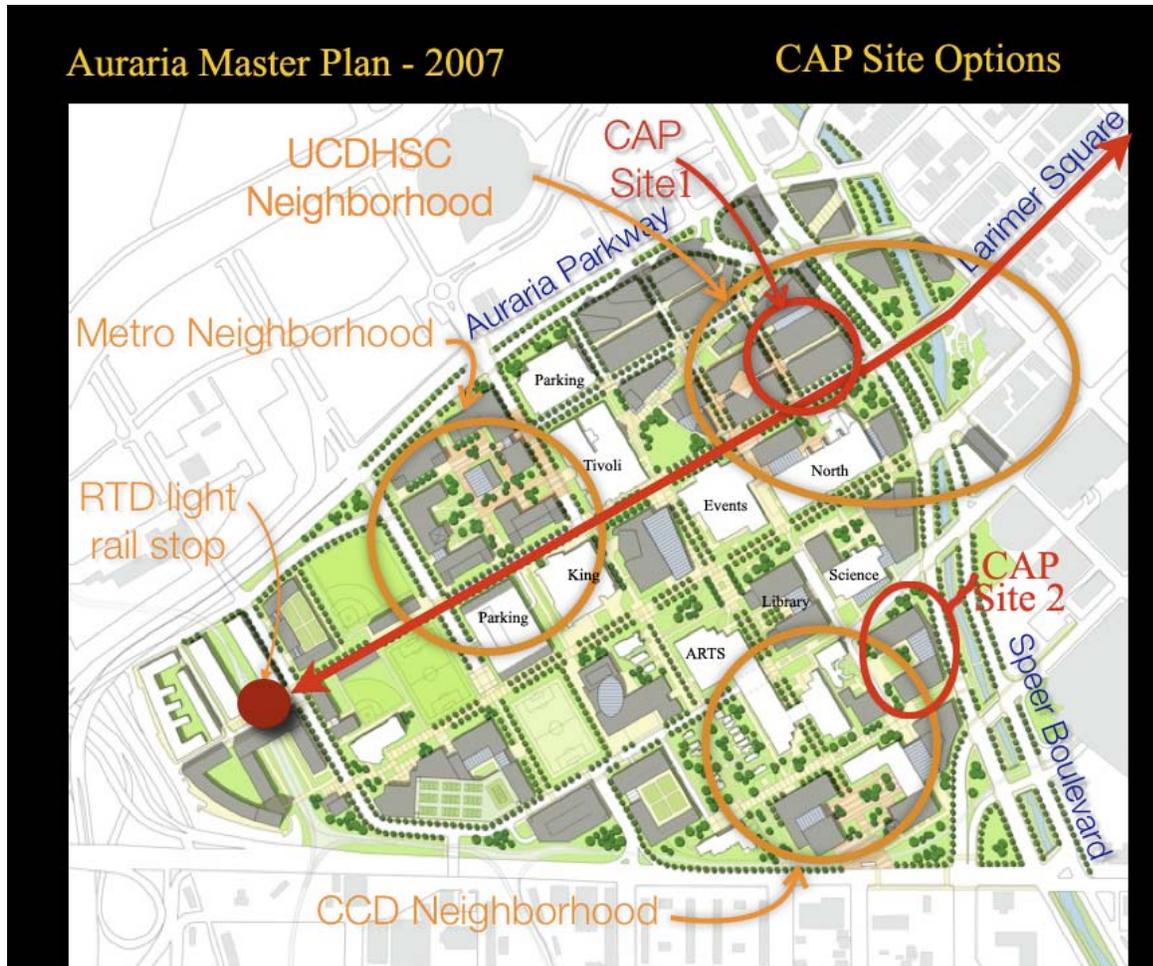


Figure 20: CAP Building Site Options

**Site Constraints - View Corridor**

**Views to and from the site**

Important views to and from the proposed site include the following:

- Axial view from Downtown Denver along Larimer Street into the proposed building site (Option 1) and along Arapahoe Street into the proposed building site (Option 2). These views are experienced by both the pedestrian and vehicular traffic along Larimer Street and Arapahoe Street
- A regional axial vista exists from the alignment of Speer Boulevard south of Colfax Avenue to the site. Views along the southeastern perimeter of the site address much of

Downtown Denver, including the Denver Performing Arts Center, the Colorado Convention Center, and various high-rises.

### **Current View Corridor Constraints**

There are two view corridors imposed on the campus by the community. The first is the City of Denver “Old City Hall” view corridor which begins at the bell statue at the corner of 14th and Larimer Street. This corridor is the most restrictive as it relates to new development on the north and western sides of campus. The corridor (City of Denver Ordinance, ORD133, 3-14-88) establishes a sight line from the bell to the mountains. It limits building heights to 1 ½ - 2 stories near Speer Boulevard and 4-5 stories at the western edge of campus.

The second is the “Civic Center” view corridor. This maintains the mountain view from the Civic Center which is east of campus. Its point of reference begins at the top step of the State Capitol and crosses the southern portion of campus.

Buildings at the Auraria site are currently limited to heights of 5400 feet above sea level at Champa Street and approximately 5425 feet above sea level at 5th Street. Existing elevations determine maximum building heights can be as tall as 190 to 220 feet, well beyond what the campus will ever consider. Internal views have also been developed over the years. These views capture more detail than the larger, regional focuses. They provide an avenue for one’s attention to be drawn internally to the campus. Views capture aspects specific to the Auraria campus. Examples of these views include St Cajetan’s and the Emmanuel Gallery entrances from the Lawrence Street Pedestrian Mall, and the view to St. Elizabeth’s Church from Arapahoe Street.



Figure 21: Current View Plain Parameters

An analysis of the view corridor and site development options is currently underway by AHEC. The resulting impact of this analysis on the CAP building site is still unknown.

## ***D. Design Requirements***

### **1. Infrastructure/Utilities**

As part of the recent AHEC master plan development, a site infrastructure analysis is in progress. Specific infrastructure requirements for this project are yet to be determined. Initial assumptions for the new CAP building include the following:

#### **Electrical Distribution**

The campus is fed by two separate 13.2 kV substation feeders from Xcel Energy. Each of the feeders enters the primary switchgear and metering equipment in the Arts Building. Each of these two main switchgear lineups supplies four fused circuits that reticulate through underground duct banks to the respective building transformers. All primary distribution equipment downstream of the primary meters, including transformers, high voltage cabling, and primary selector switches, are owned and operated by AHEC.

#### **Chiller/Steam**

##### **Cooling**

It is assumed that a stand alone chiller system will support the facility.

##### **Steam**

It is assumed that the current campus steam distribution system will be enhanced to serve both site options. Xcel Energy Company provides district steam to the campus via the Delegany and Zuni Steam Plants. Steam enters the campus at Colfax and Tenth Streets just east of the Technology Building. It enters the campus at a pressure of approximately 150 psi through a 12 inch pipeline but is reduced to 40 psi for distribution through the campus. The main line runs along Tenth Street to the Plaza Building with an extension to the North Classroom and Science Buildings. Steam is currently supplied to ten classroom buildings at a pressure of 12 psi at the building entrance. Additionally, Xcel Energy will provide natural gas through a distribution pipe line to the new campus building.

##### **Sewer – Sanitary and Storm**

The AHEC campus maintains all sanitary lines from its buildings up to the point of connection with the Denver city system. Specific requirements for sanitary and storm systems, including on-site detention, is yet to be determined. The new building will require studies of the existing line capacity. Results will dictate whether additional lines are required or upsizing/replacement is an option.

## 2. Building Systems and Performance Criteria

The CAP project will comply with the State of Colorado requirements regarding LEED certification. Specific strategies for achieving certification will be fully addressed during the pre-design and design phases. Assessments of building efficiency will also be made during pre-design, which will allow an opportunity for a comprehensive review of long-term operating efficiencies, energy savings, technology needs, and other sustainability issues.

The 120,000 square-foot facility will employ numerous sustainable strategies in an integrated design. The CAP building will adapt to seasonal variations, provide flexibility in space configurations, and accommodate changes in technology. The design will be based on human needs and ergonomics. The building systems will reflect the latest AHEC and University of Colorado at Denver and Health Sciences Center standards. These standards include many of the best practices found in the LEED standards. The building systems may include: energy recovery systems, advanced control systems, direct digital control systems. The building will feature extensive day-lighting and may be naturally ventilated throughout. The use of revolutionary “green design” technology will be implemented to regulate heat and air-conditioning.

The building orientation will minimize heat gain and define quadrangles that will be places of formal exchange among the CAP building, prototyping lab, exterior yard, and the other new campus buildings. Additionally, as now envisioned, the CAP building’s roof will have a green area with plant materials and an ability to harvest water rain in order to keep those plants moist.

The building envelope will be designed to be as transparent as possible to allow the landscape to infiltrate with views into and out of the space while allowing the activity of the interior to read through to the exterior. This expression on the exterior is important due to the almost 24-hour occupancy requirement of the building, therefore creating a new stage for events and a place of vibrancy for the entire arts sub-campus area. The design will include windows and clerestories that allow for maximum daylight throughout the interior, reducing energy consumption and improving light quality. Design strategies that allow for day lighting to penetrate inner spaces of the building at various levels will be promoted.

The design will use a sensible, engineered approach to harvesting daylight. Possible strategies may include a significant amount of glazing and exterior sun screening elements. Solutions that produce light shelf surfaces that bounce light from sills to the ceiling spaces within, allowing both ambient and indirect lighting, harvesting light through multiple means are desirable. This approach is in its own way a building integrated system which screens out the potential solar gain but allows for ambient day light.

These attributes are reflected in the following seasonal conceptual diagrams.

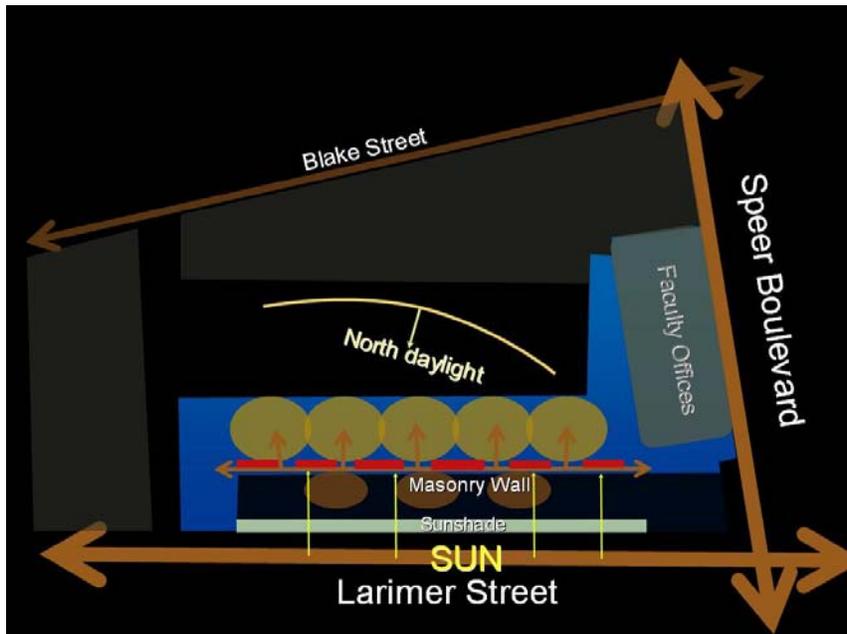


Figure 22: Site Conditions

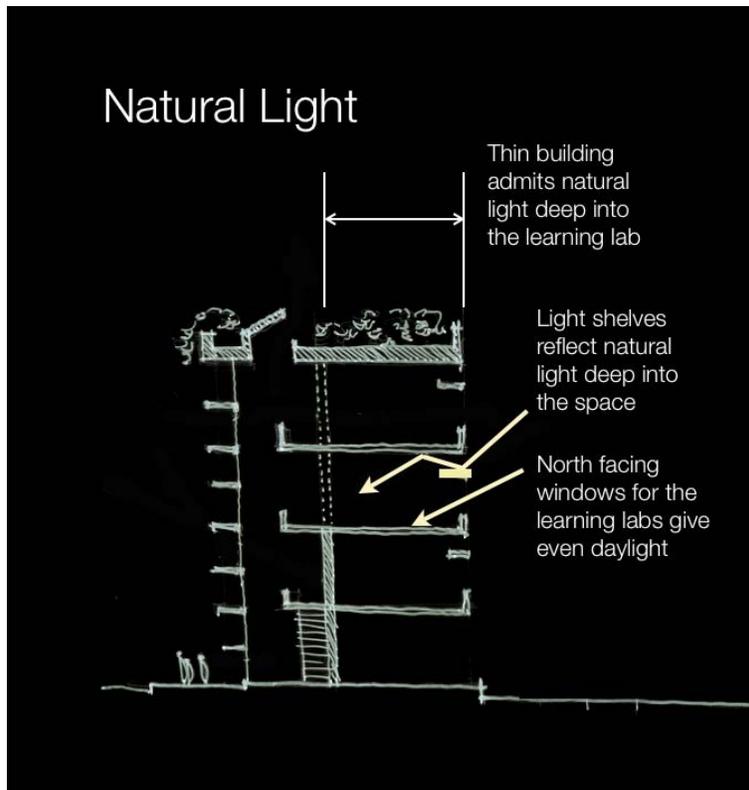


Figure 23: Light Concept

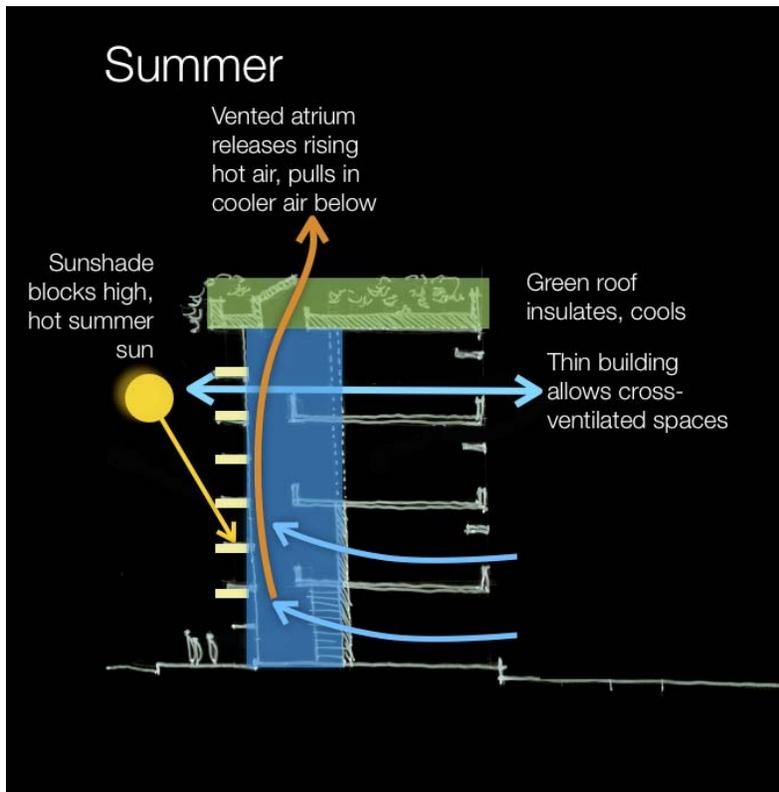


Figure 24: Summer Conditions

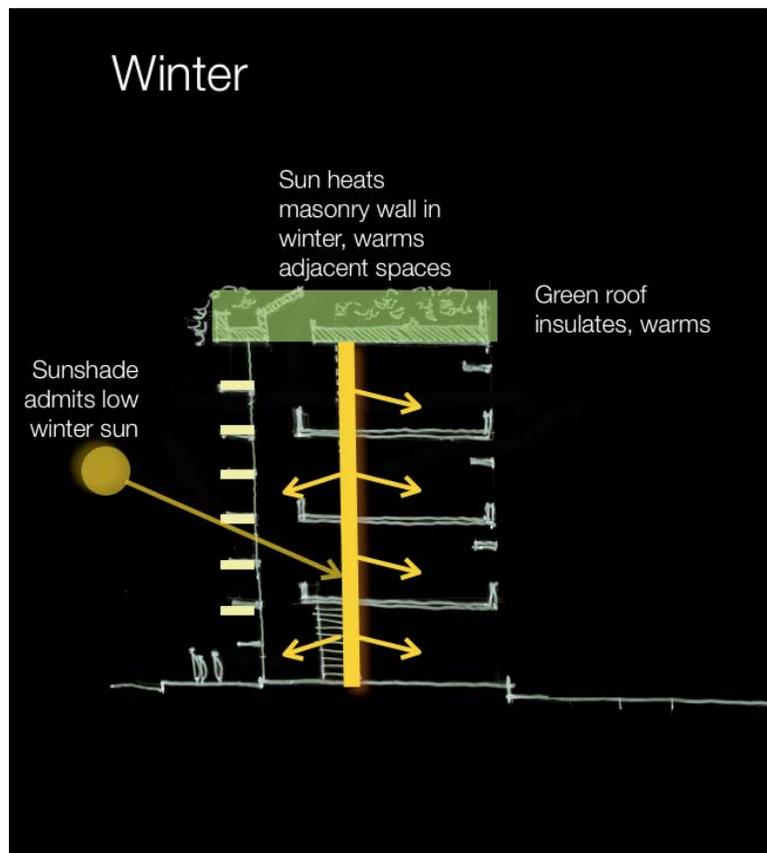


Figure 25: Winter Conditions

A significant aspect of the project is the landscape improvement scheme. The design solution for the Larimer St. site option includes moving a surface parking lot. As now envisioned, the lot will be replaced in the future with a sustainable landscape “quadrangle” scheme that incorporates a series of complementary ecological elements including: down lighting, storm water flow, control and storage, infiltration through retention and permeable surfaces, with resultant evapo-transpiration. Evapo-transpiration is a natural process that oxygenates the air and yields fresh air at the places of air intake near the new facility, but also to the surrounding facilities and climate. The landscape will be significantly enhanced and serve as an outdoor classroom in sustainable landscape and architecture. The project design team will analyze the costs and benefits of each of the above systems to determine which shall be incorporated during the design phase.

### **3. Health, Life Safety and Code Requirements**

The following analysis for the new College of Architecture and Planning building is based upon this program and preliminary plan information, without a building design. A comprehensive code analysis will be completed during the Schematic Design, Design Development and Construction Document phases of the project. The Auraria Higher Education Center and the University of Colorado have overall jurisdiction for the project and will provide final interpretation on code issues.

Within its jurisdictional authority, the University will employ the services of an independent code consulting firm to be responsible for review of the design and construction documents for compliance with applicable codes and standards. State inspections will be required during construction for elevators, electrical, and plumbing work.

This project falls under the State Buildings Programs(SBP). As such, the following list of building codes and standards shall govern this project:

- 2003 International Building Code (IBC)
- 2003 International Mechanical Code (IMC)
- 2003 International Energy Conservation Code (IECC)
- 2005 National Electric Code (NEC)
- 2003 International Plumbing Code (IPC)
- 2003 International Fuel Gas Code (IFGC)
- 2003 International Fire Code (IFC)
- 2001 ASME Boiler and Pressure Vessel Code
- 2001 National Boiler Inspection Code (NBIC)
- 2002 Controls and Safety Devices for Automatically Fired Boilers CSD-1
- 2001 Boiler and Combustion Systems Hazards Code, NFPA 85
- 1998 ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
- National Fire Protection Association Standards

- (NFPA) as follows:
  - NFPA-1 (2000), 10 (1998), 11 (1998), 11A (1999), 12 (2000), 12A (1997), 13 (1999), 13D (1999), 13R (1999), 14 (2000), 15 (1996), 16 (1999), 17 (1998), 17A (1998), 20 (1999), 22 (1998), 24 (1995), 25 (2002), 45 (2004), 72 (1999), 231D (1998), 409 (1995), 705 (1997) and 2001 (2000)
- ASME A17.1 (Safety Code for Elevators - 2000)

#### A. Building

The Building is expected to be a maximum of 4 stories tall, which is allowed by the IBC for B Occupancies for all Construction Types except Type V. For this review, it is anticipated that the Building will be Type II-A construction. An Occupancy Type B is possible by keeping Assembly (A) and Hazardous (H) Occupancies as accessory uses (less than 10% of the floor area). Continuous setbacks of 20 feet or more should be maintained from the property lines.

#### B. Fire Resistance

At this time the structural system is assumed to be steel; the final determination will depend upon a variety of factors including the vibration isolation criteria of the program spaces; the cost and schedule and how these two parameters interface, the architectural design and how conventional or unusual it must be to accommodate the program.

Currently the fire resistance of building components is assumed as follows:

- The fire resistance of structural members shall be 1 hour.
- Fire resistance of exit routes shall be of not less than one hour fire resistive construction.
- Fire resistance of vertical openings shall be of not less than 2 hour fire resistive construction.
- Fire resistance of special occupancy enclosures—bulk hazardous material storage—shall be enclosed with the appropriate fire resistive construction.
- Fire resistance of other building elements like partitions, doors and exterior openings shall be of the appropriate fire resistive construction for the required construction type and fire separation.
- Sealing of penetrations through fire resistive construction separations shall be fire stopped.

#### C. Fuel Control

Combustible building materials shall be limited per IBC 603. Interior finishes shall have a minimum Class C flame spread classification and Class B in exits.

#### D. Means of Egress

The means of egress system is composed of the exit access, the exit and the exit discharge. Occupant Loads shall be calculated for each floor to determine exits and will comply with the following requirements:

- The number of exits shall not be less than two (2) above the first story and in basements (except where the story has an occupant load of more than 500).

Conference rooms and lecture rooms with occupancies of 50 or more must have at least two exits.

- b) The minimum width of exits shall be 0.2 inches per occupant in stairways and 0.15in other exits.
- c) The maximum travel distance to an exit is 300 feet for a B Occupancy.
- d) The maximum allowable dead end corridor is 50 feet.
- e) The maximum common path of travel shall be 100 feet.
- f) All doors must swing in the direction of exit travel.
- g) A place of refuge may serve as an acceptable means of egress.
- h) Exit signage and exit access doors shall be marked by an approved sign.
- i) Exit lighting at the means of egress shall be illuminated at all times.
- j) An emergency power supply shall be provided.

#### E. Fire Protection Systems

The devices, equipment and systems or combinations of systems used to detect a fire, activate an alarm, extinguish or control a fire, control or manage smoke and products of a fire or any combination thereof will/shall be provided as follows:

- a) Portable fire extinguishers shall be provided.
- b) An automatic fire sprinkler system shall be provided.
- c) A standpipe system shall be provided where floors are located 30 feet above fire department vehicle access.
- d) Fire department access will be maintained on building sides and suppression requirements shall be reviewed with the fire department.
- e) Smoke resistance shall be provided in doors through fire resistive walls.
- f) Manual pull stations shall be provided.
- g) Automatic detectors shall be provided.
- h) Occupant notification and alarms shall be provided.
- i) Systems sequence of operation shall be in compliance with codes.
- j) Smoke extraction shall be provided in stairways serving four or more floors.
- k) Smoke, fire dampers and detectors shall be provided.
- l) Stair pressurization is not required for four stories.
- m) High rise building requirements do not apply.
- n) Basement requirements for special smoke control do not apply.

#### F. Building Services

All building services shall meet applicable codes as follows:

- a) An emergency generator shall be provided.
- b) Elevators shall be in compliance with codes.
- c) Accessibility shall be in compliance with codes.
- d) Plumbing shall be in compliance with applicable codes.
- e) Ventilation and exhaust shall be in compliance with applicable codes.
- f) Electrical work shall be in compliance with applicable codes.

## 4. Architectural Design Features

The new College of Architecture and Planning building will become a landmark building of architecture and planning for the Auraria campus. It will be located at the center of the most dominant face of the campus, adjacent to downtown Denver. The

two site options under consideration provide prime location on the campus mall and the high visibility from Speer Boulevard both lend to the possibilities for excellence in architecture and design. By carefully considering the vision assumptions and the specific needs of the users, the CAP Building will be both highly functional and aesthetically inspiring.

A major factor, which is crucial to the success of this project, is correct site placement: how this structure fits into its context and strengthens the overall character of the site. By taking into consideration the setbacks, potential view plane constraints, utilities, and campus master plan, the College of Architecture and Planning Building will naturally become a piece of the Auraria Campus and the City. The Auraria campus is an integral part of the City, and it must be considered an urban campus. The very location of the proposed building lends itself to being a prominent feature on the face of Auraria - facing the city and presenting itself as a place of high technology, state of the art architecture facilities, and innovative learning techniques. The goal is to create this image while simultaneously being considerate of the existing campus architecture. The structure needs to complement and blend into the campus, yet retain its own identity as a College of Architecture and Planning building.

Connectivity to the campus also includes outdoor space and entrances to the building. Outdoor space becomes a place for informal gatherings, quiet study spots, and outdoor classrooms. These places add vitality and life to a campus and the College of Architecture and Planning building would be no exception. Another connectivity concern is the circulation from outside to inside through the building entrances. The relationship between the exterior walking paths and how one enters a building is key to how a building will be used and how it will eventually evolve.

The quality of the interior space is also essential to the evolution of a building. The most important architectural consideration is the functionality. The College of Architecture building has specific requirements with types of space, circulation patterns, connectivity, flexibility and interaction. The need is to create spaces where open interaction can occur between faculty and students, formal and informal, and design flexible learning spaces that can transform with changing teaching methodologies and technology. Most importantly, the project needs to generate space that will inspire the present and future architectural and planning communities. Light, openness, visibility, integration are all important attributes for the building design. A major design feature includes an atrium around which the rest of the school is organized - a kind of beating heart at the core. Such common entrance areas are intended to foster an easy flow of communication and physical movement. Students will be able to see one another and be seen, crossing easily between various parts of the building, generating a vibrant sense of activity.

To be designed as a center of activity and accessible 24-hours a day, the new CAP building will not only provide a world class facility for its curriculum, but also create a new stage for events and place of vibrancy for the entire UCD neighborhood area and northeastern edge of the AHEC campus site. The new building may be designed as three or four levels at varying heights - creating a dynamic facade, especially from Speer Boulevard. Large expanses of windows are envisioned that will bring the exterior landscape and the city inside. Skylights and clerestories will bathe the work spaces with natural light, giving the occupant the impression that he or she is still a

part of the outside. The use of glass panels in place of walls is preferred. These elements help to elevate the mood so that there will be a feeling of lightness about the space. The openness of the workspaces, the outside city that can be seen from within, and the vividness of color and materials inside should create an exhilarating experience for the aspiring architects, planners and landscape architects within. The Downtown Area Plan shows a rendering of the Larimer Street campus development as the City would like to see this. The new building shown on the right-hand side is on the location of the proposed new CAP building, at the northwest corner of Speer Blvd. and Larimer Street.



*Figure 26: Site Rendering – Larimer Street*

The College of Architecture and Planning building at Auraria will be a fascinating building. It will serve as a regional model for energy efficiency and alternative methods of building design. It will serve as a living laboratory for architects, planners, engineers, students, and the public for years in the future.

## ***E. Project Scheduling and Phasing***

### **1. Project Schedule**

The following schedule best represents a timeline associated with design and construction once the project is funded.

- Project Design: July 2008 – June 2009
- Core/Shell Construction: July 2009– June 2010

- Finish/Equip: July 2010 – June 2011
- Occupancy: July 2011

It is assumed that the project will be built by the Construction Manager/General Contractor (CM/GC) process. The CM/GC will be hired during the design phase and will develop the actual construction schedule. It is anticipated that the CM/GC will issue a Guaranteed Maximum Price for the project at the end of Design Development. Construction may begin at that time by means of a fast track process. The fast track process utilizes bid packs which allow bidding and constructions for certain systems before the entire building is completely designed and documented.

## 2. Cost Estimate

The project budget was determined by using a combination of resources that included consulting architects' analysis, recent project experience of this type at the Anschutz and Denver campus sites, and current market conditions. Means square foot costs, and similar projects recently completed across the country were the primary sources.

Once the schematic design is complete, a detailed project budget can be developed. The following page outlines the preliminary budget associated with the project. The budget is considered a complete project cost based on the information available to this date.

Table 9 –CAP Capital Request Budget

	Total Project Cost	FY 2008-09	FY 2009-10	FY 2010-11
<u>Land Purchase Cost</u>				
<b><u>Professional Services</u></b>				
Master Plan/PP				
Site Surveys, Investigations, Reports	\$224,030	\$44,806	\$89,612	\$89,612
Architectural/Engineering/Basic Services	\$3,285,775	\$2,628,620	\$328,578	\$328,578
Code Review/Inspection	\$180,000	\$30,000	\$90,000	\$60,000
Construction Management				
Advertisements				
Other (LEED Consulting)	\$597,400	\$477,920	\$59,740	\$59,740
<b>Total Professional Services</b>	<b>\$4,287,205</b>	<b>\$3,181,346</b>	<b>\$567,930</b>	<b>\$537,930</b>
<b><u>Construction</u></b>				
Infrastructure				
(a) Service/Utilities	\$750,000		\$750,000	
(b) Site Improvements	\$750,000			\$750,000
Structure/Systems/Components				
(a) New (GSF): 120,000	\$28,370,681		\$17,022,409	\$11,348,272
New \$236/GSF				
Other (Specify)				
High Performance Certification Program				
<b>Total Construction Costs</b>	<b>\$29,870,681</b>		<b>\$17,772,409</b>	<b>\$12,098,272</b>

<b>Equipment and Furnishings</b>				
Equipment	\$2,640,000			\$2,640,000
Furnishings	\$1,244,700			\$1,244,700
Communications	\$960,000			\$960,000
<i>Total Equip. and Furnishings Cost</i>	\$4,844,700			\$4,844,700
<b>Miscellaneous</b>				
Art in Public Places =1% of Total Construction Costs	\$298,707		\$177,724	\$120,983
Relocation Costs	\$298,707			\$298,707
Other Costs (TAP fee)	\$400,000		\$400,000	
<i>Total Misc. Costs</i>	\$997,414		\$577,724	\$419,690
<b>Total Project Costs</b>	\$40,000,000	\$3,181,346	\$18,918,062	\$17,900,592
<b>Project Contingency</b>				
5% for New	\$2,000,000	\$159,067	\$945,903	\$895,030
<i>Total Contingency Requested</i>	\$2,000,000	\$159,067	\$945,903	\$895,030
<b>Total Budget Request</b>	<b>\$42,000,000</b>	<b>\$3,340,413</b>	<b>\$19,863,965</b>	<b>\$18,795,621</b>
<b>Source of Funds</b>				
State Funds - CCFE	\$27,000,000		\$14,034,173	\$12,965,827
Cash Funds - FE	\$15,000,000	\$3,340,413	\$5,829,792	\$5,829,794

Cost estimate assumptions used in the preparation of this preliminary budget include:

- Site is perfectly clean and the utilities are immediately adjacent to the site.
- AHEC waives their project management services fee and does not hire a program manager – The UCD provides PM services.
- All electronic security is eliminated.
- Initial estimate assumes the space mix of approximately 40-50% education-type space and 50% office-type.
- Assumes that the instructional space is fully furnished and office furnished @ \$2,000/office.
- Assumes Denver does not raise its water tap fees for project.
- Assumes the building efficiency is in the 60 to 62% range versus 65% - 68%.
- The project is authorized in the Spring of 2008.
- Natural gas or electricity will be the source for heating and cooling vs. having a central plant for steam and chilled water.
- There is speculation that LEED gold requirement that will go into effect Jan 1, 2008 will add 5% to initial building cost but saves much more over the life of a building. Budget reflects 2% for the known professional services cost

(registering, tracking, and commissioning costs); however building costs have not been adjusted upwards.

- Cost escalation assumption of 5% was used in the preparation of this cost estimate.

### **3. Financing Explanation**

The anticipated project funding includes both cash and state capital construction funding resources. The University is requesting funding authorization for this project over a three-year period. The first year's request (FY 2008-09) will complete the project design. The Year 2 (FY 2009-10) project authorization will allow for the completion of the core/shell construction, and the Year 3 (FY2010-2011) authorization is necessary to complete the fit-out and furnishing/equipping of the facility. Each year the campus will update the budget accordingly, through the capital construction budget process.

## **IV. Appendices**

***A. College of Architecture and Planning – Graduate Studies Brochure***

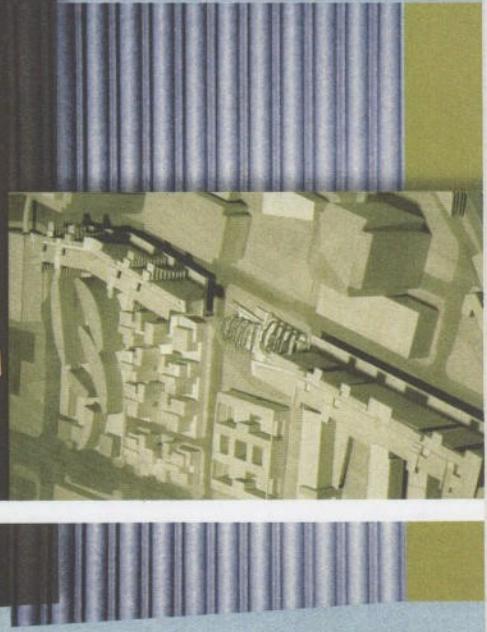
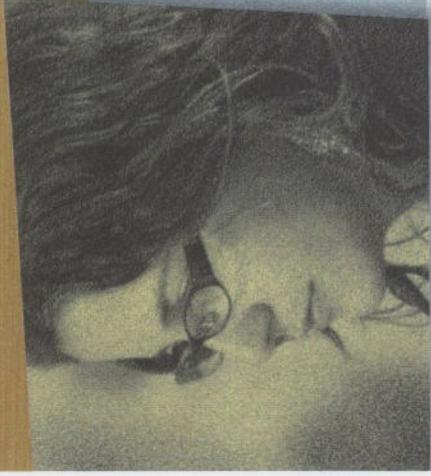
***B. Space Utilization by Classroom/Lab Hours of Use Detail***

***C. Facilities Audit Report for CU-Denver Building***

***D. Third Party Review – Fentress Bradburn***

**Appendix A. College of Architecture and Planning – Graduate Studies Brochure**

Graduate Studies College of Architecture and Planning



# OPPORTUNITIES

Imagine the opportunities for architects, landscape architects, planners and urban designers, especially in the urban West.

We are conceiving and constructing buildings, towns and landscapes in one of the fastest growing, most dynamic regions in the country. Join us in the College of Architecture and Planning at the University of Colorado at Denver and Health Sciences Center, and you'll learn how to tackle these challenges.



# A VISION OF INTEGRATIVE DESIGN

To help you prepare for an engaging, productive career in the design and planning professions, the College of Architecture and Planning has developed a bold vision called Integrative Design.

## Engage design and planning challenges that are significant for our society.

We are not an ivory tower. Learning experiences in our college address real issues facing designers and planners as they create healthier, more sustainable, more meaningful environments for the 21st century. In recent years, among many other socially important projects, our students have: designed alternatives to suburbia; built award-winning solar-powered homes; written new codes to encourage livelier, safer cities; discovered ecological design principles in Colorado ranches; proposed ways for neighborhoods to recover from natural disasters; invented new ideas for affordable housing.

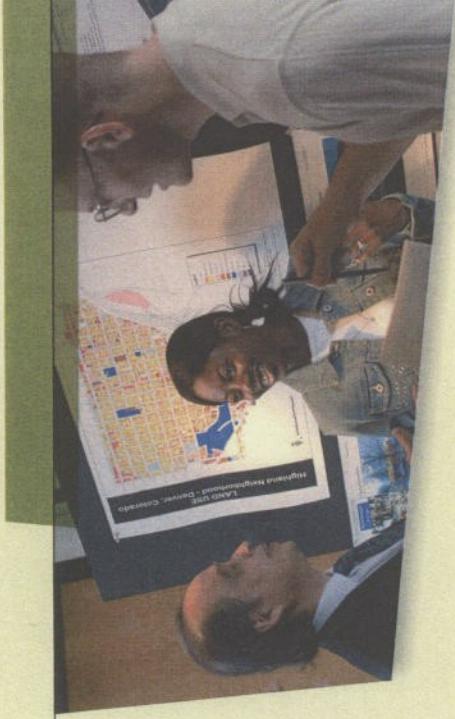
## Engage these challenges in partnerships among the disciplines and with our external communities.

No one discipline can address these issues alone. Architects, landscape architects, planners, urban designers, and developers must work together to create holistic, healthy, sustainable environments. In our college, you will have opportunities to:

- Participate in multi-disciplinary teams, modeling the practices of today's successful design and planning firms.
- Interact with outstanding practicing designers and planners in the Denver metro area, through internships, mentorships, design juries, lectures, and engaged student professional organizations.

## We offer the following degrees:

*Bachelor of Environmental Design*  
*Master of Architecture*  
*Master of Landscape Architecture*  
*Master of Urban and Regional Planning*  
*Master of Urban Design*  
*Doctor of Philosophy in Design and Planning*



# PROMINENCE AND DISTINCTION

We are one of the largest colleges of architecture and related design and planning disciplines in the country, with around 1,000 undergraduates, 500 graduate students, 40 full-time faculty, and 50 visiting lecturers.

This size allows us to create a number of communities of interest across the disciplines, bringing together faculty, students and practitioners who share an interest in a particular theme, and

building synergistic relationships among them. These communities of interest are rapidly building areas of prominence and distinction for the college. Our communities of interest currently include:

- Emerging Practices in Design
- Sustainable Urbanism
- Healthy Environments
- Cultural Heritage

## INTEGRATIVE DESIGN





### Emerging Practices in Design

Exploring how the digital design revolution and sustainable design practices are reshaping the professions. These include sustainable design and design/build practices as well as digital visualization and Building Information Modeling (BIM) technologies

#### Student Victory

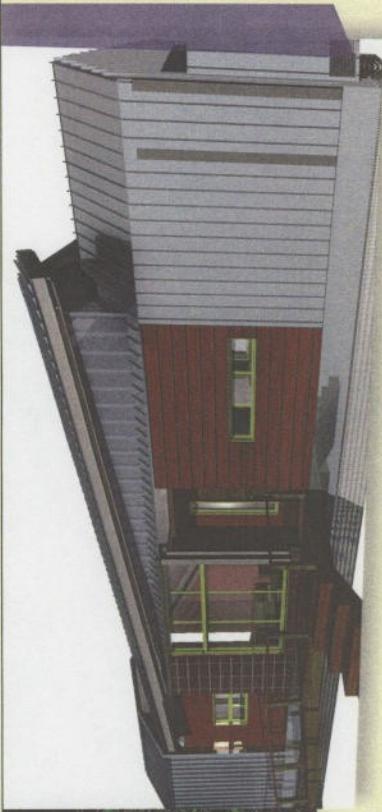
A team of 30 architecture and engineering students successfully defended its championship and took first place overall in Solar Decathlon 2005. The second international Solar Decathlon on the Washington, D.C. Mall pitted 18 collegiate teams from the U.S. and Puerto Rico, Canada and Spain in a competition to design, build and operate the best solar-powered home, while educating the public about alternative energy. The winning home was built from renewable resources including soybeans, corn and wheat.

#### Student Experience

The students in the graduate Comprehensive Studio build large-scale cut-away models to explore the relationship between design and detailed construction. Students can obtain Green LEED certification in one of our graduate classes.

#### Faculty

Professor of Architecture Julee Herdt led our teams to back-to-back victories in the international Solar Decathlon competition. She is also developing new building materials and processes based on renewable materials. Associate Professor Osman Ataman is developing digital "smart walls" with flexible polymer materials.



Associate Professors of Architecture Bob Flanagan and Keith Loffin and Associate Professor of Planning Ray McCall explore issues ranging from BIM and new Web technologies to modular design. Assistant Professor Matthew Jelacic is exploring new sustainable technologies and design concepts for international refugee housing.

# PROMINENCE AND DISTINCTION

## Sustainable Urbanism

Exploring new ideas about creating livable cities in the midst of intense pressures for growth and fragile ecosystems

### Student Victory

Joining forces with business students, two of our graduate students won the prestigious 2005 Urban Land Institute Gerald D. Hines Student Urban Design Competition for their redevelopment plan for the Magna Township in Utah's Salt Lake Valley. The group, which beat teams from Harvard, Columbia and University of Texas-Austin, was lauded for its "evolutionary strategy" backed by a "resourceful business plan." The team received a \$50,000 cash prize for first place and was further honored in a resolution passed by the Denver City Council.

### Faculty

Professor and Chair of Planning and head of the Center for Sustainable Urbanism Tom Clark has written extensively on tourism and growth, and economic development for communities. Peter Park, Associate

Professor and Director of Urban Design, is also the Director of Planning for the city of Denver, and is developing innovative form-based zoning codes to promote desirable urban form. Professor of Planning and Associate Dean Yuk Lee works on urban spatial analysis and urban transportation planning. Professor of Architecture George Hoover and his students are exploring new ideas for transit oriented developments.

Associate Professor of Planning Kevin Krizek researches land use and transportation planning. Associate Professor and Chair of Landscape Architecture Austin Allen and his students are working with the residents of the Lower Ninth Ward in New Orleans to rebuild their community. Assistant Professor of Planning Brian Muller is developing advanced GIS applications for predicting growth patterns. Assistant Professor Michael Jensen explores the cultural complexities of modern cities, and Assistant Professor

of Landscape Architecture Joern Langhorst studies restorative landscapes. Assistant Professor of Planning Jeremy Németh writes on the intersection between urban design and public policy.



## Healthy Environments

Exploring how to build healthier buildings, cities and landscapes

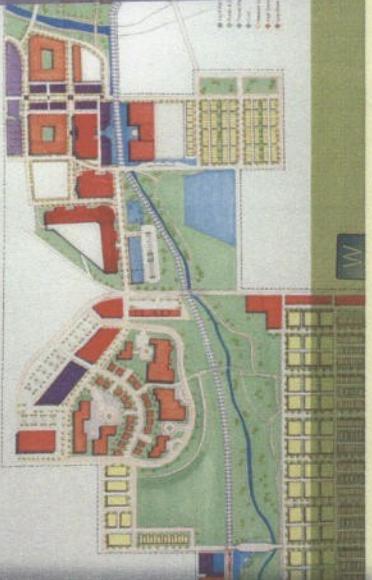
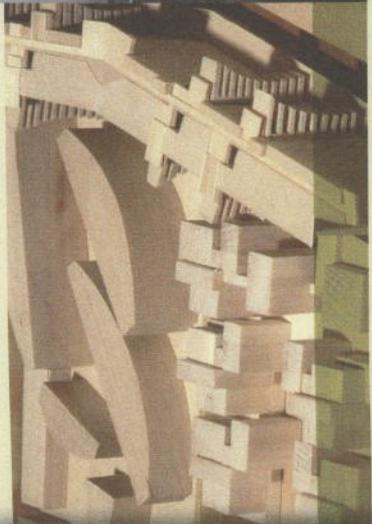
### Student Experience

Students have helped develop and deliver innovative projects like the Child-Youth Friendly City initiative in Denver, the Neighborhood Atlas Project, and the Collaborative Garden Project. Students working in the Learning Landscape Initiative have designed more than 40 innovative playgrounds for the Denver Public School System, and then studied the impacts of these designs on children's behavior.

### Faculty

Professor of Planning Willem van Vliet, head of the Children, Youth and Environments (CYE) Center and the PhD program, has written extensively on the relationship between environment and health and behavior. Professor of Landscape Architecture Lois Brink, who invented and directs the Learning Landscape Initiative in CYE, was named the nation's Outstanding Educator in Landscape Architecture for 2005 by

the Council of Educators in Landscape Architecture. Professor of Planning Fahriye Sancar is partnering with the Department of Epidemiology and Preventive Medicine to conduct research on Community Design and Public Health. Professor of Planning Louise Chawla is an international expert on environment and behavior, with an emphasis on children.



# PROMINENCE AND DISTINCTION

## Cultural Heritage

Understanding, interpreting and preserving our cultural heritage in design and planning, including historic buildings, landscapes and intellectual and cultural ideas

### Student Experience

Students have joined college research projects to document places like Anasazi Pueblo ruins, Hispanic Homesteads, National Park structures, and Lawrence Halprin's 1970s Denver Skyline Park. A Preservation Design Studio explores issues such as adaptive re-use of historic buildings. Numerous seminars allow students to explore contemporary issues in architectural and landscape architecture history and theory.

### Faculty

Associate Professor of Architecture Kat Vlahos and her students have been studying historic ranches in northwestern Colorado to rediscover their underlying ecological principles of design. Assistant Professor of Landscape Architecture Ann Komara and her students have received numerous grants

for historic preservation projects. Professor of Architecture Ping Xu studies the relationship between principles of Chinese feng shui and the ancient Anasazi structures in southwestern Colorado. Professor of Architecture and Associate Dean Peter Schneider, Professors of Architecture Patricia O'Leary and Joseph Juhasz, and Associate Professor of Architecture (Clinical Teaching) Barbara Ambach study ideas around cultural meaning and values in design. Associate Professor and Chair of Architecture Hans Morgenthaler and Associate Professors Amir Ameri and Taisto Mäkelä explore ideas as diverse as the philosophy of art museums to the history of Colorado architecture. Associate Professor of Architecture Christopher Koziol undertakes research in technical aspects of historic preservation.



## STUDENT PROFILE: WILL KRALOVEC

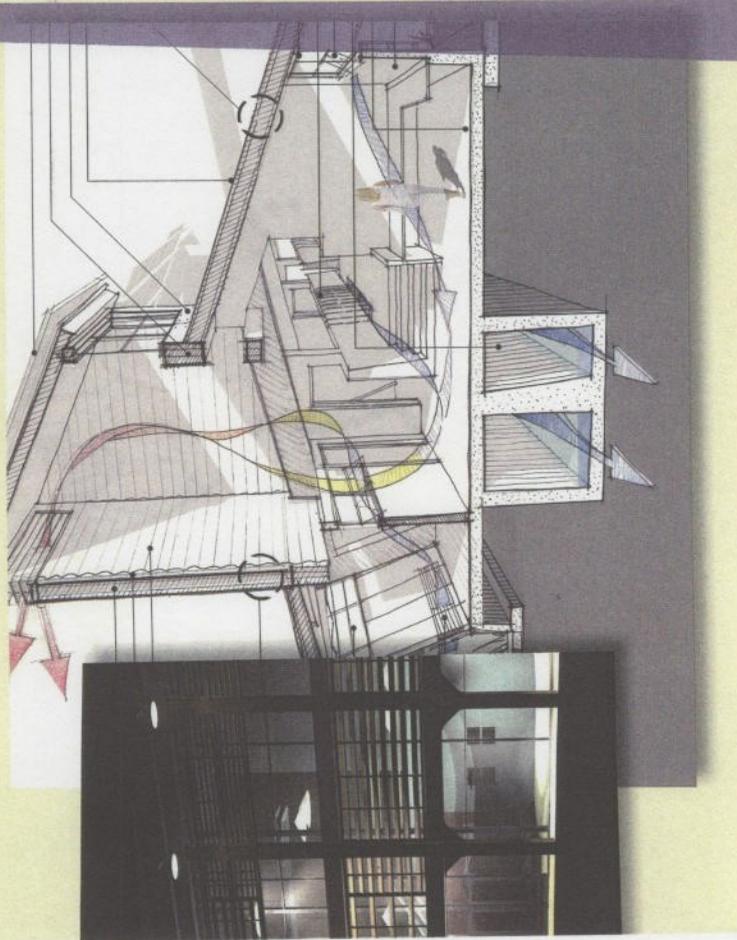
Degree: Master of Urban and Regional Planning (MURP) and Master of Urban Design (MUD); anticipated completion 2008

The past: Worked for U.S. Senator Robert Stafford; earned an MBA from Cornell University; involved for many years in real estate development and investment advice before shifting to a career that would allow more planning and site design involvement

The future: Wants to make a positive impact on the built environment through affecting policy, urban renewal work or real estate development

Experiences: Elected president of the student chapter of the Colorado American Planning Association; assisted in coordinating the Colorado Tomorrow 2005 conference; serves as a teaching assistant for Planning Studio I; competed in the NAIOP Rocky Mountain Real Estate Challenge on a student team creating a real-world redevelopment proposal for Denver's RTD Market Street Station city block

About CAP: "The physical location of the school downtown near the professional community is really important. People in Denver are accessible and open to helping students. In this field, so much depends on your contacts and who you can turn to for advice and assistance."



# CREATING AND APPLYING KNOWLEDGE

The design and planning professions have called for creating more bodies of knowledge and more effective design technologies and practices to help ensure greater success in creating healthier, more sustainable, more meaningful environments. Our college has created four research centers related to our four communities of interest. It also runs one of the oldest community outreach design centers in the country, where our expertise is applied to real world design and planning challenges in Colorado communities. These centers employ many of our own students, providing rich educational opportunities as well as additional income.

*Sustainability is a central value...of our community. It requires us to recognize the interconnectedness...of our policies and programs, as we seek to ensure that future generations will enjoy a quality of life characterized by environmental beauty, economic opportunity and resource abundance.*

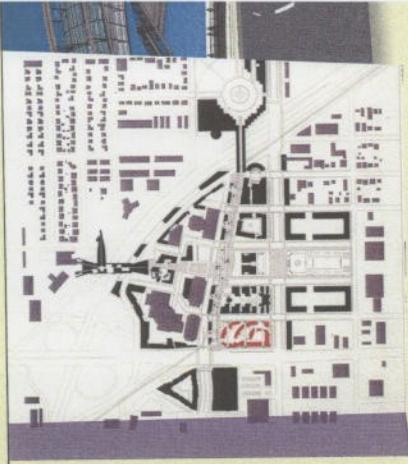
— Mayor of Denver John Hickenlooper, 2005

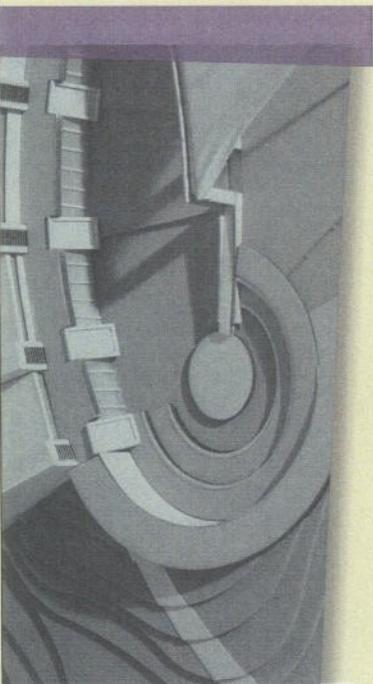
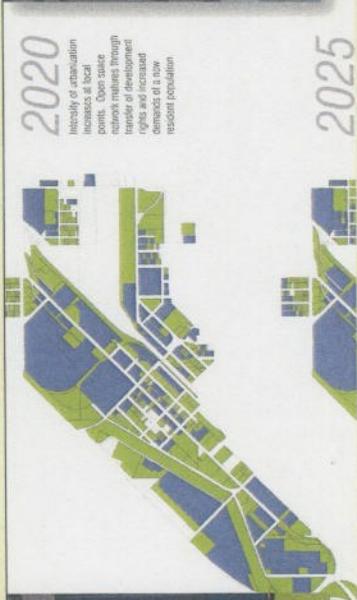
## Emerging Practices in Design

Housed in Boulder, this state-of-the-art facility provides an intellectual home for the study and exploration of new design practices and technologies. These include work on ecologically sustainable design and construction; the design/build process; digital visualization and modeling; the Building Information Modeling (BIM) revolution; and computer-driven manufacturing processes.

## Colorado Center for Sustainable Urbanism

The center examines one of Colorado's most urgent challenges—creating livable communities in the context of a booming population. This center studies growth-oriented issues, disseminates information, tests growth scenarios and provides expertise to cities and organizations involved in growth-related issues.





## STUDENT PROFILE: SCOTT ZABRISKIE, ARCHITECT, LEED AP

**Degree:** Master of Architecture (MArch 2007)

**The past:** BS in Design from Arizona State University, where he earned the Arizona Design Institute Outstanding Achievement Award; 18 years experience working with professional architectural firms in Seattle, San Francisco, Jackson Hole and Denver, ranging from high-rise commercial to multi- and single-family residential buildings; won 2002 AIA Wyoming Merit Award for a custom residence in Jackson Hole. Licensed Colorado architect since 1996; became a LEED Accredited Professional in 2006; pursuing NCARB certification

**The future:** Interested in integrating sustainable design and prefabrication for innovative and meaningful housing solutions; will pursue a combination of architectural practice and small scale development

**Experiences:** In response to a request for volunteer student design assistance, Scott is presently helping the nonprofit Douglas County Search and Rescue organization to achieve their vision for a new headquarters facility in the south Denver Metro area. The project will incorporate green building strategies and is exploring the possibility for LEED certification.

**About CAP:** "The diverse background of students and faculty at the university provides a rich and multilayered network of resources and opportunities. As a practicing architect with 4240 Architecture, I appreciated the college's emphasis on real-world attitudes, applications and projects, and the flexibility of the program to accommodate and promote individual ambitions."

## CREATING AND APPLYING KNOWLEDGE

### Children, Youth and Environments Center for Research and Design

Recently endowed by a \$2.5 million anonymous gift, the center explores how children's health and behavior are affected by the environment. For example: CYE partnered with the mayor's office to make Denver the first Child-Youth Friendly City in the U.S., and the Learning Landscape Initiative within CYE has designed and constructed 46 innovative new playgrounds for Denver schools. The *CYE Journal* is a refereed publication read in over 150 countries.

### Center of Preservation Research

This center supports the historic preservation research projects in the college. Examples include: a \$200,000 grant to develop a hands-on preservation curriculum for Colorado Mountain College; restoration planning for the Heart Mountain Japanese-

American Relocation Camp in Cody,

Wyoming; studying the cultural resource ramifications of Colorado Department of Transportation projects.

### Colorado Center for Community Development

This center provides design and planning assistance for underserved organizations, communities and neighborhoods. For example: graduate student interns have created a Trail Master Plan for Oak Creek; helped with Ride the Rockies events in Walden; developed a downtown streetscape plan for Cedaredge as well as graphic and lighting design for the Cedaredge Welcome Center; and assisted in park designs for New Castle.

*In 2030, about half of the buildings in which Americans live, work and shop will have been built after 2000.*

— Arthur C. Nelson, PhD, ASCE, FAICP, 2004



# STUDENT PROFILE: ROBIN ROONEY

Degree: Master of Landscape Architecture (MLA 2007)

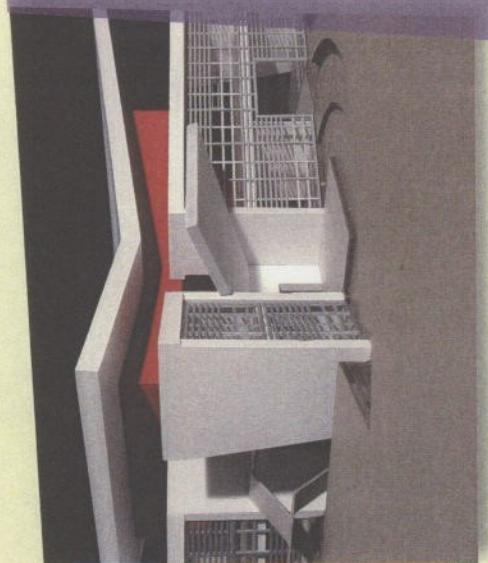
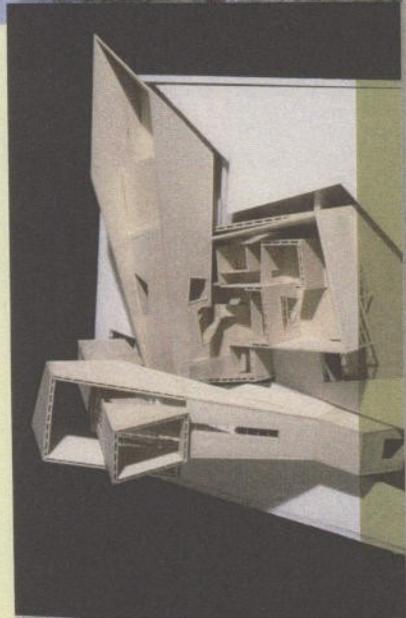
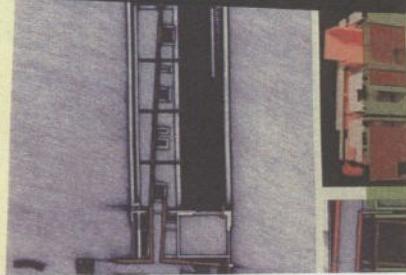
The past: BA in Philosophy and BS in Horticulture-Landscape Design from the University of Nebraska-Lincoln; eight years experience as a residential landscape designer

The future: Wants to work with communities to create places that improve the quality of life for their residents

Experiences: Professional mentor representative for Association of Students in Landscape Architecture; teaching assistant for Landscape Theory for two years; participated in New

Orleans studios; received Hideo Sasaki Scholarship, a scholarship from Colorado BPW Association, and an AmeriCorps travel scholarship to attend LABash annual national conference for students of landscape architecture in Baton Rouge; currently working with Design Studios West doing conceptual design.

About CAP: "The university has strengthened my foundation of knowledge about this profession while helping me to develop my own voice regarding landscape architecture. My studies here have helped bring clarity to the direction I want to take my design career."



# THE PLACE

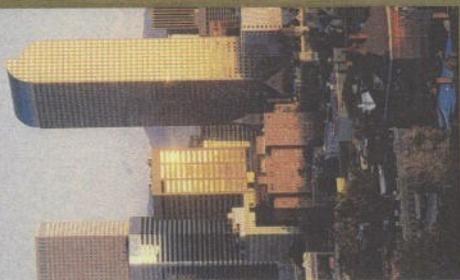
Colorado is one of the most urbanized states in the country, with more than 80 percent of its population living along the dramatic edge where a thousand miles of semi-arid Western plains abruptly crash into the Rocky Mountains.

This spectacular natural environment, moderate climate, high quality of life and career opportunities attract large numbers of people, leading to some of the highest population growth in the country. The resulting urban development in a powerful yet fragile natural environment creates significant opportunities and challenges for architects, planners, landscape architects and urban designers.

As the only college of architecture and related disciplines in this state, we sit in the center of remarkable opportunity. And we take advantage of this opportunity, in part, by delivering our programs on two campuses of the University of Colorado. Our undergraduates study on the Boulder campus, one of the most beautiful and vibrant residential campuses in the country. Our graduates study on the downtown Denver campus, in one of the most energetic, creative and growing cities. The undergrads benefit from traditional residential campus amenities, while the graduates work within walking distance of some of the major design and planning firms in the region. Denver's organizations, firms and agencies provide many of our teachers and design critics and offer opportunities for internships and professional development.

*The urban development in this powerful yet fragile natural environment creates significant opportunities and challenges for architects, planners, landscape architects and urban designers.*

— Mark Gelemerter, Dean





# DENVER

The Mile High City is a metroplex of 2.6 million people ranked by Kiplinger's Personal Finance as one of the top seven "cool" cities for young professionals for nightlife, light rail, Wi-Fi access, and of course, the Rocky Mountains.

The Centrum Healthiest Cities Study also placed Denver among the top 10 healthiest cities, not surprising given the city's 350 urban parks and 80 miles of bike trails.

Denver is one of the major regional centers in the country for design and planning firms. Denver also has a thriving art and cultural scene. The Denver Performing Arts

Complex, one of the country's major regional performing arts centers, hosts major music, theatre and film events, including those of the Tony Award-winning Denver Center Theatre Company. Opera has found a new home in the Ellie Caulkins Opera House. Adjacent to the State Capitol Building and one of the country's best City Beautiful civic parks is Denver's cultural center, with Michael Graves' Denver Public Library, the Gio Ponti Denver Art Museum, and a new wing to the Art Museum by Daniel Libeskind.

The College of Architecture and Planning sits at the edge of Lower Downtown, on the banks of Cherry Creek where gold was first discovered. LoDo is Denver's SoHo, a rich and vibrant collection of retail, restaurants, art galleries and offices in old brick warehouses and shops. LoDo is also home to many of the city's design and planning firms, just a few minutes' walk from the college. This creative energy, and authentic sense of place, helped earn Denver a place in Richard Florida's *Rise of the Creative Class* as one of the top destinations in the country for creative professionals.

# THE UNIVERSITY

The College of Architecture and Planning is part of the University of Colorado at Denver and Health Sciences Center (UCHSC), which is part of a three-university system that also includes campuses in Boulder and Colorado Springs.

UCHSC educates approximately 27,000 students with more than 100 degree and certificate programs at the bachelor's, master's, doctoral and first professional degree levels. The university generates more than \$350 million a year in research grants and contracts. It is the only public university in Denver and is rapidly emerging as one of the country's premier urban research universities.

Architecture and Planning is one of seven colleges on the downtown Denver campus, including College of Arts & Media, Business School, College of Liberal Arts and Sciences, School of Education & Human Development, College of

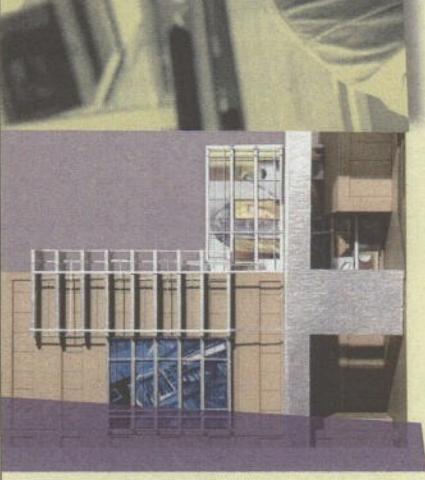
Engineering and Applied Science and the School of Public Affairs. Opportunities abound for collaboration and joint projects between CAP and the other colleges.

CAP is housed at 14th and Lawrence streets. Most of our space is devoted to design studios, which enjoy stunning views of the Colorado Rocky Mountains. These studios are open to students 24/7.

Almost all of our non-studio courses are taught on-site, in digitally equipped classrooms and seminar rooms. Our extensive workshop houses a full scale furniture-making shop, model-making tools, a spray booth and two laser cutters.

The building's wireless network provides direct access to the internet, servers, plotters and printers from each desktop.

A 34-seat Windows and Macintosh computer lab provides specialized software and scanning and plotting facilities. A visual resource center provides support for all image needs, including a traditional slide collection, access to extensive online databases of digital images, digital cameras for loan, digital image processing and professional photography staff support. Several





galleries and exhibit spaces provide for student exhibits and traveling shows. With coffee shops and restaurants right across the street in trendy LoDo, the college provides a congenial environment for learning in the design and planning disciplines.

### GUEST SPEAKERS

The college invites prominent speakers to talk about emerging design and planning issues. Recent speakers include:

- Bill Hillier, Professor of Architectural and Urban Morphology at the University of London, on understanding and predicting how people will use public spaces
- Chris Luebke, director and leader of the global foresight and innovation initiative at Arups, a global firm of designers, engineers, planners and business consultants, on major global trends influencing the world of design
- Richard Jackson, Professor of Environmental Health Science, School of Public Health, University of California, Berkeley, on the impact of the built environment on health
- Richard Louv, journalist and author of *The Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*, on the relationship between nature and children

We offer the following certificate programs:

- Historic Preservation Design/Build*
- Geospatial Information Science*
- Healthy Environments*

# CONNECTIONS

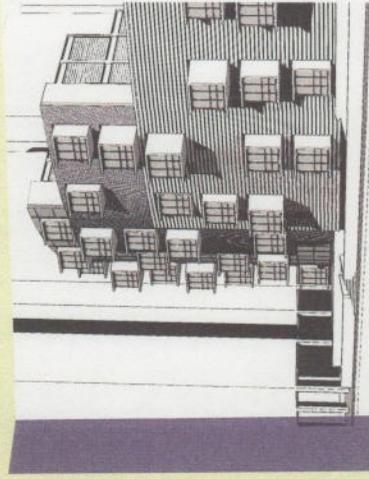
The College of Architecture and Planning offers an exceptional degree of career development support. The Colorado Mentoring Network, a partnership with AIA-Colorado, was named one of three Best Practices in Mentorship nationally for its work pairing senior-level undergraduates, graduate students and young professionals with architecture, planning and landscape architecture practitioners. These mentorships provide invaluable insight into the professions and fruitful connections for the future.

As a graduate student, you can take advantage of a host of internships, which will prepare you for employment. Architecture students will also accumulate credits to sit for the Architect Registration Exam (ARE).

## Designing internships that work

The College of Architecture and Planning maintains about 200 firms and agencies on its internship roster. These are some of the organizations where our students have completed internships:

4240 Architecture  
Anderson Mason Dale Architects  
Barker Rinker Seacat Architecture  
Bennett Wagner & Grody Architects  
Carter Burgess  
The City of Arvada  
The City of Boulder  
The City of Denver  
Civitas  
David Owen Tryba Architects  
The Davis Partnership  
Design Studio West  
The Design Workshop  
Fentress Bradburn  
Gensler  
H+L Architecture  
HNTB  
*klipp*  
Lake/Flato Architects  
Merrick and Company  
Mundus Bishop  
The National Park Service  
Norris Design  
PBS&J  
RNL Design  
URS Corporation  
U.S. Forestry Service



# SUCCESS

Alumni from the College of Architecture and Planning are reshaping the world in which we live.

## David Dowall, PhD (MURP 1974)

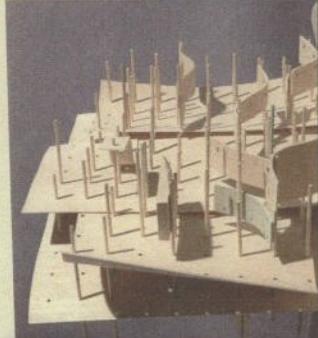
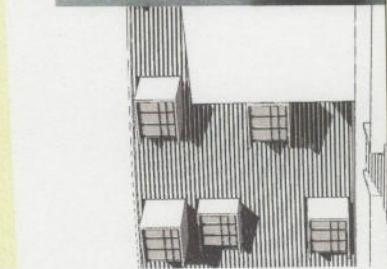
Director of the Institute of Urban & Regional Development and Professor of City and Regional Planning at the University of California, Berkeley. With research interests in domestic and international land management, housing policy, economic development strategy and infrastructure planning and finance, he has carried out policy research and designed technical and financial assistance strategies for cities and regions in more than 40 countries.

## Astrid Haryati, ASLA, CLARB (MLA 1997)

Assistant to the Mayor for Green Initiatives for the City of Chicago, where she develops environmental policies and programs including high performance infrastructures such as greening the expressways, parks and open space and streetscape beautification. She also coordinates the mayor's landscape advisory committees.

## Caroline Hoyt (BArch 1967)

Co-founder and Chief Designer of McStain Neighborhoods, one of the most successful green community builders in the region, with developments at Belmar in Lakewood, Stapleton and Platt Park in Denver, and High Plains Village at Centerra in Loveland. She has planned and/or designed more than 5,000 homes in Boulder County.



# SUCCESS

## Brian Klipp, FAIA (BArch 1973)

Founding Principal of the firm *klipp*, whose notable projects include the Hyatt Regency Denver at Colorado Convention Center, Denver School of Science and Technology, Denver Central Library, and the Integrated Teaching and Learning Laboratory, College of Engineering and Applied Science and Discovery Learning Center at the University of Colorado-Boulder. Recent commissions include the Denver Justice Center Courthouse.

## Jane Kulik, ASLA (MLA 1998)

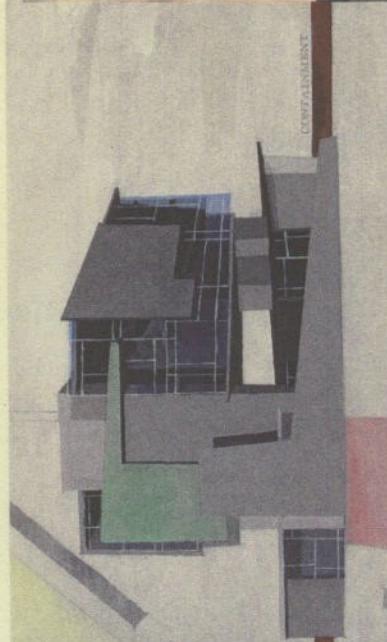
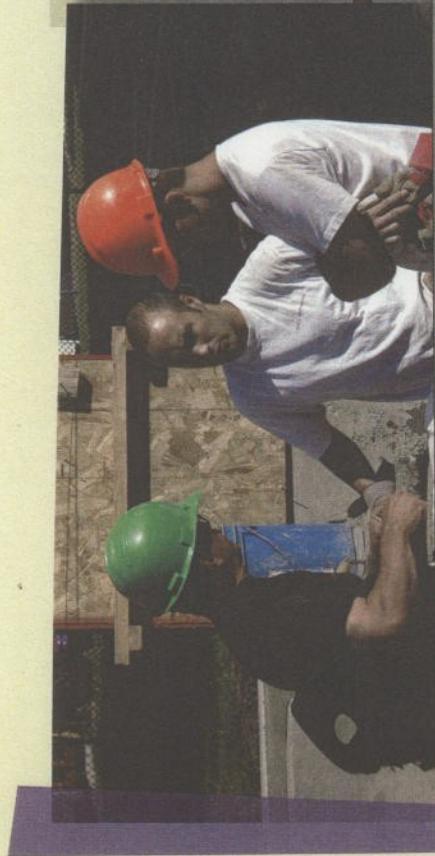
Vice President and Principal at Wenk Associates. Her projects mainly feature large-scale planning in open space, parks, greenways, and urban waterway restoration realms; she served as a key member of the multidisciplinary consultant team that prepared the Los Angeles River Revitalization Master Plan, and led Wenk Associates' work on Denver's Game Plan, the City's first adopted parks and recreation master plan since 1929. Jane was 2006 President of the Colorado Chapter of the American Society of Landscape Architects.

## Joy Lujan (BEnvd 1997, MURP 2000)

A planner with the Rivers, Trails, and Conservation Assistance Program of the National Park Service in Denver. Joy specializes in helping communities in Colorado, Utah, Montana, and Wyoming move from vision to reality in natural resource conservation and outdoor recreation.

## Todd Mead, ASLA (MLA 1991)

A Principal at Civitas, Inc, a nationally recognized group of urban design and landscape architects who uniquely integrate strategic thinking with exceptional design talent and creative problem solving skills to make a difference in the quality of life in cities. Todd is leading multiple projects that focus on the design of culturally and regionally evocative urban landscapes, including the Saint Louis urban redevelopment, the Beloit College campus, San Diego River Park, and locally at the riverfront park at Invesco Field Mile High Stadium and the Boulder Community Hospital Foothills Campus.



**Jennifer Moulton, FAIA  
(MARCH 1978)**

Was the city planner for Denver from 1991 until her untimely death in 2003. Under her leadership, Denver embraced the idea that it could be a great city with great architecture. Jennifer was the driving force behind Blueprint Denver, a major land use and transportation plan for the city. She worked on downtown revitalization and the redevelopment of the Central Platte Valley, the former Stapleton Airport and the former Lowry Air Force Base.

**Bobbi Jones Sabine, RLA  
(BENV 1986, MLA 1989)**

President of Aamazon Natural Resources Consulting, LLC, in Grand Haven, Michigan, providing natural resources regulatory consulting for threatened species, wetlands, critical dunes, natural rivers, streams, floodplains, and other protected surface resources. Bobbi also serves as an Ottawa County Parks Commissioner, president of a local businesswomen's group, and on the board of directors for the local Audubon Society.

**Ken Schroeppel, AICP  
(MURP 2000)**

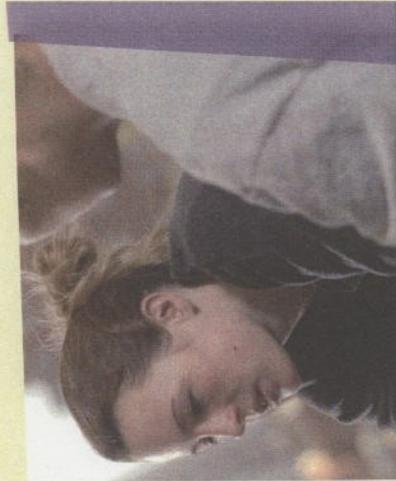
Project manager and urban planner for Matrix Design Group in lower downtown Denver, where he specializes in conducting and managing projects related to downtown revitalization, urban redevelopment and infill development planning, blight studies and urban renewal planning, site and facility assessments, and data collection and quantitative analysis methodologies. Sharing his passion about quality urban development, Ken launched a Web site and blog, Denverinfill.com, that is considered a must-read among developers, politicians, brokers, and neighborhood groups.

**David Owen Tryba, FAIA  
(BARCH 1977, MARCH 1981)**

Principal, Tryba Architects. Since the firm's founding in 1988, the design studio at Tryba has been nationally recognized for its commitment to human-scaled, contextual modern urbanism. A leader in the design of civic and cultural institutions, urban infill, transit development and mixed use, the firm's award-winning portfolio includes the Wellington Webb Municipal Office Building, the 9-acre mixed use Clayton Lane, LoDo's Mercantile Square and CityCenter Englewood. David is the master urban design architect for the Denver Justice Center campus.

**Liz Telford, AICP  
(MURP 1995)**

Manager of Corridor Planning for the Regional Transportation District, Denver, where she is responsible for environmental analysis quality control on multiple corridors and has managed large multi-modal environmental projects. She is project manager for the Gold Line, a rapid-transit line from Union Station to Arvada and Wheat Ridge to be built in 2011-2015.



# SEE US NOW

At the University of Colorado at Denver and Health Sciences Center College of Architecture and Planning, we are looking for people who want to help build healthy, beautiful and sustainable communities—places that not only work in harmony with the environment, but also honor the past, adapt to the present and create a better future. We are looking for people who see things differently.

Intrigued?

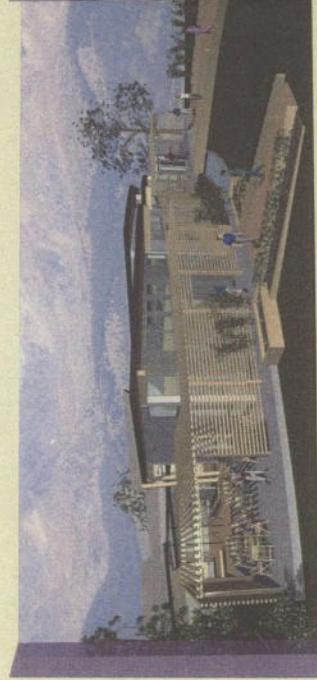
Call us now to schedule  
a visit—303.556.3382.  
<http://exploreCAP.cudenver.edu>

## Office

1250 14th Street, 3rd Floor  
303.556.3382  
Fax: 303.556.3687

## Mailing Address

College of Architecture and Planning  
University of Colorado at Denver  
and Health Sciences Center  
Campus Box 126  
P.O. Box 173364  
Denver, CO 80217-3364



# COLLEGE OF ARCHITECTURE AND PLANNING PROFILE 2006 - 07

**Locations**  
Undergraduates study in Boulder, Colorado;  
graduate students study in downtown  
Denver, Colorado.

**Students**  
Total: 1333  
Graduate: 501  
Undergraduate: 832

**Degrees Awarded '06**  
Total: 365  
Graduate: 180  
Undergraduate: 185

**Undergraduate Degree Program**  
Bachelor of Environmental Design

**Graduate Degree Programs**  
Master of Architecture  
Master of Landscape Architecture  
Master of Urban and Regional Planning  
Master of Urban Design  
PhD in Design and Planning

**Certificate Programs**  
Certificate in Historic Preservation  
Certificate in Design/Build  
Certificate in Geospatial Information Science  
Certificate in Healthy Environments

**Student-Faculty Ratio**  
Undergraduate: 21:1  
Graduate: 16:1

**Faculty**  
Full-time: 51  
Lecturers: 53

**Alumni**  
Graduate: 3,392  
Undergraduate: 3,314

**Fully accredited**  
By Landscape Architecture Accreditation  
Board (LAAB); National Architecture  
Accrediting Board (NAAB); Planning  
Accreditation Board (PAB)

## Image Credits

Special thanks to photographers Jennifer Kirschke, Lynn Lickteig, Tom Cherrey, George Hoover, and Lori Cockenham.

## Student Work

*Front cover*  
RTD Transfer Station Model - Alan Doggett,  
Matthew Mullane  
TOD Master Plan Model - Tamara Layman

*Inside cover*  
Solar Energy International Visitors Center -  
Tyler Jones  
Emergence Magna (ULI Student Design  
Competition) - Nate Abbott, Blake Belanger,  
Blake Church, Thomas Magloczki,  
Chip Radabaugh

*Page 3*  
Form Z Networks - Steven Perce  
Solar Decathlon Home Exterior - Isaac Oaks

*Pages 4-5*  
TOD Master Plan Model - Tamara Layman  
Federal Boulevard Station - Nate Abbott,  
Tonya Bennett, Joelle Coakley, Erin Fosdick,  
Anne Hayes, Candace Lothian

*Pages 6-7*  
Creede Repertory Theater - Kimbal Kurtz  
Solar Energy International Materials and Technical  
Data - Brent Bartels, Jay Fourniea, Tyler Jones

*Pages 8-9*  
RTD Station - Brian Weber  
RTD Station Staircase Drawing - Ezekiel Freeman,  
Tyler Jones

*X Zone 2020/2025 - Kyle Hebel,  
Meredit Schildwachter*

*Prairie Gateway Sustainable Youth Center Model -  
Jennifer Kelly, Steven Rouisse, Scott Zabriskie*

*Pages 10-11*  
Schweiger Ranch Experimental Farming Lab -  
Thorsten Foerster

*Studio Model - Edward Rivas*  
Bayou Template Part II - Patrick Rawley  
North Campus Music Studies Building Model -  
Sonja Ferdows, David Gross

*Page 12*  
Cranbrook Academy of Art Model - Joana Ernhof,  
Annicia Streete

*Page 13*  
New State Capitol Mixed Use Office Building  
Urban Context - Gary Taipalus

*Pages 14-15*  
Body Wraps - John Westbrook

*Pages 16-17*  
Sheet Perspectives Layout Drawing - Brian Weber  
Shoe Boutique Model - David Kennett

*Pages 18-19*  
Library Pharmakon - Tim Hutchison,  
Daniel Stewart

*Page 20*  
Solar Energy International Visitors Center Drawing -  
Alan Doggett, Kelly Jernigan

Graduate Studies College of Architecture and Planning



**Appendix B. Space Utilization by Classroom/Lab Hours of Use Detail**

Fall 2006 UCDHSC D1 course meeting hours, A&P COURSES ONLY (COURSE OFFERING COLLEGE = AP)  
 OIRPA, DD. Source: I:\OIRPA\CU System\Requests\Campus Utilization Rates\ClassrmSpaceUtil18.sas

ADJUSTED FOR PASSING PERIODS USING CALCULATION OF HOURS = MINUTES / 50

Cross-listed sections combined under sponsor course ID

ALL MEETING PATTERNS ACTIVE IN FIRST WEEK OF CLASSES ARE SHOWN.

MAY BE MULTIPLE PER COURSE. SCH AND ENROLLMENT SHOWN ON FIRST PATTERN ONLY SO TOTALS ARE

Student contact hours = course enrollment \* weekly meeting hours

	Meeting Hours (1 hour = 50 min)	Student Contact Hours (hours * enrollment)	Student Credit Hours	Average Occupancy
<b>Building</b>				
			1,670	
<b>CU-DENVER BUILDING, 1250 14TH ST</b>	237	6,723	3,240	72%
<b>NORTH CLASSROOM BUILDING</b>	19	961	918	54%
<b>PLAZA BUILDING (FORMERLY ST)</b>	3	159	159	78%
<b>UNASSIGNED</b>	6	48	24	.
<b>A&amp;P Total</b>	265	7,891	6,011	70%

## Fall 2006 UCDHSC D1 course meeting hours

OIRPA, DD. I:\OIRPA\CU System\Requests\Campus Utilization Rates\ClassrmSpaceUtil18.sas

Campus holidays removed

Student contact hours = course enrollment \* weekly meeting hours

A&amp;P COURSES ONLY (COURSE OFFERING COLLEGE = AP)

ADJUSTED FOR PASSING PERIODS USING CALCULATION OF HOURS = MINUTES / 50

## Course Academic Unit D1

		Hours of Meeting Time, Including Passing Period						Student Contact Hours (enrollment * hours)					
		Day					Weekly Total	Day					Weekly Total
		M	T	W	R	F		M	T	W	R	F	
WeekNum	WeekStartDay	71	47	63	66	18	265	2,035	1,692	1,604	2,193	367	7,891
1	8/20/2006												
2	8/27/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
3	9/3/2006		47	63	66	18	194		1,692	1,604	2,193	367	5,855
4	9/10/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
5	9/17/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
6	9/24/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
7	10/1/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
8	10/8/2006	68	47	63	66	18	262	2,011	1,692	1,604	2,193	367	7,867
9	10/15/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
10	10/22/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
11	10/29/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
12	11/5/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
13	11/12/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
15	11/26/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
16	12/3/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862
17	12/10/2006	68	47	63	66	18	262	2,011	1,689	1,604	2,191	367	7,862

Fall 2006 UCDHSC D1 course meeting hours, A&P COURSES ONLY (COURSE OFFERING COLLEGE = AP OIRPA, DD. Source: I:\OIRPA\ICU System\Requests\Campus Utilization Rates\ClassrmSpaceUtil18.sa

ADJUSTED FOR PASSING PERIODS USING CALCULATION OF HOURS = MINUTES / 5/  
Cross-listed sections combined under sponsor course II

ALL MEETING PATTERNS ACTIVE IN FIRST WEEK OF CLASSES ARE SHOWN  
MAY BE MULTIPLE PER COURSE. SCH AND ENROLLMENT SHOWN ON FIRST PATTERN ONLY SO TOTALS ARE CORRECT

Student contact hours = course enrollment \* weekly meeting hour

CourseID	CRS_MEET_SEQ	CourseLevel	CRS_TRM_TITLE_DESC	ACTIVITYTYPEDESC	Comb Enrl	Comb SCH	MeetStartDate	MeetEndDate	MEETING DAYS	STARTTIME	ENDTIME	BLDG CODE	BLDG	ROOM	duration_h	StuContact	SISRoomC	PctOccupied
															our_adjus	Hours	apacity	
ARCH5110001	1	Grad	DESIGN STUDIO I	MAIN LAB SECTION	12	72	21AUG06:00	16DEC06:00	MR	1215PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	12.4	148.8	50	24%
ARCH5110002	1	Grad	DESIGN STUDIO I	MAIN LAB SECTION	36	72	21AUG06:00	16DEC06:00	MR	1225PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	12	432	50	72%
ARCH5131002	1	Grad	DESIGN SEMINAR III	SEMINAR	13	26	21AUG06:00	16DEC06:00	MW	0100PM	0150PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	2	26	50	26%
LA 5501001	1	Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 1	STUDIO	27	81	21AUG06:00	14OCT06:00	T	1225PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	6	162	50	54%
LA 5501001	2	Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 1	STUDIO			21AUG06:00	14OCT06:00	F	0800AM	1230PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	5.4	145.8	50	54%
U D 6600001	1	Grad	TRANSFORMATN/DECOMPOSITN STUDIO	STUDIO	13	78	21AUG06:00	16DEC06:00	MW	0100PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	300	10.6	137.8	50	26%
ARCH5130001	1	Grad	DESIGN STUDIO III	MAIN LAB SECTION	72	56	21AUG06:00	16DEC06:00	MW	0200PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	400	8.2	590.4	50	144%
ARCH5131001	1	Grad	DESIGN SEMINAR III	SEMINAR	59	28	21AUG06:00	16DEC06:00	MW	0100PM	0150PM	CU	CU-DENVER BUILDING, 1250 14TH ST	400	2	118	50	118%
ARCH6490001	1	Grad	ST/PS.DIGITAL PORTFOLIO DESIGN	LECTURE	15	45	21AUG06:00	16DEC06:00	R	1000AM	1245PM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	49.5	15	100%
ARCH6490002	1	Grad	ST/PS.INTRO TO DIGITAL DESIGN & ANALYSIS	LECTURE	14	42	21AUG06:00	16DEC06:00	M	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	46.2	15	93%
ARCH6490003	1	Grad	ST/PS.POETIC POTENTIAL OF COMPUTERS	LECTURE	11	33	21AUG06:00	16DEC06:00	M	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	36.3	15	73%
ARCH6490006	1	Grad	ST/PS.DENVER RESEARCH PROJECT	LECTURE	15	45	21AUG06:00	16DEC06:00	T	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	49.5	15	100%
LA 6642002	1	Grad	LANDSCAPE ARCHITECTURE DIGITAL DESIGN WORKSHOP	LECTURE	9	27	21AUG06:00	16DEC06:00	F	0200PM	0445PM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	29.7	15	60%
LA 6642003	1	Grad	LANDSCAPE ARCHITECTURE DIGITAL DESIGN WORKSHOP	LECTURE	11	33	21AUG06:00	16DEC06:00	R	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	460	3.3	36.3	15	73%
ARCH5111001	1	Grad	DESIGN SEMINAR I	SEMINAR	22	66	21AUG06:00	16DEC06:00	T	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3.3	72.6	75	29%
ARCH5330001	1	Grad	ENVIRONMENTAL CONTROL SYSTEMS I	LECTURE	45	135	21AUG06:00	16DEC06:00	TR	0530PM	0645PM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3	135	75	60%
ARCH6370001	1	Grad	INTRO TO DESIGN BUILD	SEMINAR	23	69	21AUG06:00	16DEC06:00	W	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3.3	75.9	75	31%
LA 6632001	1	Grad	SITE PLANNING	LECTURE	36	108	21AUG06:00	16DEC06:00	F	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3.3	118.8	75	48%
JRP 5501001	1	Grad	PLANNING ISSUES AND PROCESSES	LECTURE	43	129	21AUG06:00	16DEC06:00	W	0230PM	0515PM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3.3	141.9	75	57%
JRP 5510001	1	Grad	PLANNING METHODS I	LECTURE	53	159	21AUG06:00	16DEC06:00	M	0230PM	0515PM	CU	CU-DENVER BUILDING, 1250 14TH ST	470	3.3	174.9	75	71%
ARCH5111002	1	Grad	DESIGN SEMINAR I	SEMINAR	23	69	21AUG06:00	16DEC06:00	T	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	75.9	45	51%
ARCH5410001	1	Grad	PROFESSIONAL PRACTICE	LECTURE	14	42	21AUG06:00	16DEC06:00	F	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	46.2	45	31%
ARCH6390001	1	Grad	ST/TS.SOLAR & SUSTAINABLE DESIGN	LECTURE	24	72	21AUG06:00	16DEC06:00	W	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	79.2	45	53%
ARCH6390002	1	Grad	ST/TS.FUNDAMENTALS OF DAYLIGHTING	LECTURE	22	66	21AUG06:00	16DEC06:00	R	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	72.6	45	49%
ARCH6390003	1	Grad	ST/TS.GREEN BUILDING TECHNOLOGY	LECTURE	37	63	21AUG06:00	16DEC06:00	T	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	122.1	45	82%
LA 5510001	1	Grad	GRAPHIC MEDIA IN LANDSCAPE ARCHITECTURE	LECTURE	26	78	21AUG06:00	16DEC06:00	R	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	85.8	45	58%
LA 5521001	1	Grad	HISTORY OF LANDSCAPE ARCHITECTURE	LECTURE	28	84	21AUG06:00	16DEC06:00	W	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	92.4	45	62%
JRP 6660001	1	Grad	REAL ESTATE DEVELOPMENT PROCESS	LECTURE	42	126	21AUG06:00	16DEC06:00	M	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	480	3.3	138.6	45	93%
LA 5572001	1	Grad	LANDSCAPE ECOLOGY	LECTURE	33	99	21AUG06:00	16DEC06:00	M	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	490	3.3	108.9	40	83%
LA 6631001	1	Grad	LANDSCAPE CONSTRUCTION MATERIALS AND METHODS	LECTURE	30	90	21AUG06:00	16DEC06:00	TR	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	490	6.6	198	40	75%
LA 6670001	1	Grad	PLANTS IN DESIGN	LECTURE	28	84	21AUG06:00	16DEC06:00	W	0100PM	0345PM	CU	CU-DENVER BUILDING, 1250 14TH ST	490	3.3	92.4	40	70%
JRP 6653001	1	Grad	NATURAL RESOURCE MANAGEMENT & PLANNING	LECTURE	22	66	21AUG06:00	16DEC06:00	W	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	490	3.3	72.6	40	55%
ARCH6150001	1	Grad	COMPREHENSIVE DESIGN STUDIO	MAIN LAB SECTION	106	64	21AUG06:00	16DEC06:00	TR	0200PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	8.2	869.2	50	212%
ARCH6151001	1	Grad	COMPREHENSIVE DESIGN SEMINAR	SEMINAR	106	32	21AUG06:00	16DEC06:00	TR	0100PM	0150PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	2	212	50	212%
LA 6605001	1	Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 5	STUDIO	55	102	21AUG06:00	14OCT06:00	M	1225PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	6	330	50	110%
LA 6605001	2	Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 5	STUDIO			21AUG06:00	14OCT06:00	R	1225PM	0525PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	6	330	50	110%
JRP 6630001	1	Grad	PLANNING STUDIO I	STUDIO	21	126	21AUG06:00	16DEC06:00	MW	0530PM	0620PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	2	42	50	42%
JRP 6630L01	1	Grad	LAB	LAB	21	0	21AUG06:00	16DEC06:00	MW	0630PM	0940PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	7.6	159.6	50	42%
JRP 6631001	1	Grad	PLANNING STUDIO II	STUDIO	16	96	21AUG06:00	16DEC06:00	TR	0530PM	0620PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	2	32	50	32%
JRP 6631L01	1	Grad	LAB	LAB	16	0	21AUG06:00	16DEC06:00	TR	0630PM	0940PM	CU	CU-DENVER BUILDING, 1250 14TH ST	500	7.6	121.6	50	32%
DSPL7686002	1	Grad	ST. PLANNING AND DISASTERS	SEMINAR	4	4	21AUG06:00	16DEC06:00	M	0900AM	1130AM	CU	CU-DENVER BUILDING, 1250 14TH ST	505	3	12	25	16%
U D 6686001	1	Grad	ST.URBAN EXPERIENCE SEM	LECTURE	17	51	21AUG06:00	16DEC06:00	MW	1130AM	1245PM	CU	CU-DENVER BUILDING, 1250 14TH ST	700	3	51	10	170%
U D 5500001	1	Grad	URBAN EXPERIENCE STUDIO	STUDIO	17	102	21AUG06:00	16DEC06:00	MW	0100PM	0500PM	CU	CU-DENVER BUILDING, 1250 14TH ST	740	9.6	163.2	15	113%
ARCH6290002	1	Grad	ST/CS:HOME ON THE RANGE	LECTURE	11	33	21AUG06:00	16DEC06:00	R	1000AM	1245PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320A	3.3	36.3	20	55%
ARCH6290004	1	Grad	ST/CS: IN SEARCH OF A WEEKEND/SECOND HOME	LECTURE	18	54	21AUG06:00	16DEC06:00	W	0100PM	0345PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320A	3.3	59.4	20	90%
ARCH6290008	1	Grad	ST/CS:LANDSCAPE URBANISM	LECTURE	13	39	21AUG06:00	16DEC06:00	W	0900AM	1145AM	CU	CU-DENVER BUILDING, 1250 14TH ST	320A	3.3	42.9	20	65%
ARCH6160001	1	Grad	ARCHITECTURAL PHOTOGRAPHY	SEMINAR	14	42	21AUG06:00	16DEC06:00	R	0830AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3.3	46.2	20	70%
ARCH6290001	1	Grad	ST/CS:ULTIMATE CONCERN & ARCHITECTURE	LECTURE	9	27	21AUG06:00	16DEC06:00	MW	1000AM	1115AM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3	27	20	45%
ARCH6290003	1	Grad	ST/CS:ARCH OF THE PERMANENCE	LECTURE	10	30	21AUG06:00	16DEC06:00	TR	1130AM	1245PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3	30	20	50%
DSPL7004001	1	Grad	COLLOQUIUM IN DESIGN AND PLANNING	SEMINAR	11	11	21AUG06:00	16DEC06:00	F	1200PM	0200PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	2.4	26.4	20	55%
LA 6686001	1	Grad	ST.CONTESTED TERRAINS	LECTURE	18	54	21AUG06:00	16DEC06:00	W	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3.3	59.4	20	90%
JRP 6673001	1	Grad	TRANSPORTATION PLANNING: TRANSPORT NET ANALYSIS	LECTURE	9	27	21AUG06:00	16DEC06:00	T	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3.3	29.7	20	45%
JRP 6686001	1	Grad	ST. DESIGN REVIEW	LECTURE	13	39	21AUG06:00	16DEC06:00	W	1130AM	0215PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3.3	42.9	20	65%
JRP 6686003	1	Grad	ST.REAL WORLD PLANNING	LECTURE	16	48	21AUG06:00	16DEC06:00	M	0530PM	0815PM	CU	CU-DENVER BUILDING, 1250 14TH ST	320C	3.3	52.8	20	80%
DSPL7001001	1	Grad	PH.D. SEM: DSGN, PLANING THEORY/METHODOLOGY	SEMINAR	8	16	21AUG06:00	14OCT06:00	TR	0400PM	0550PM	CU	CU-DENVER BUILDING, 1250 14TH ST	740B	4.4	35.2	10	80%
ARCH5310001	1	Grad	INTRO TO BUILDING TECHNOLOGY	LECTURE	61	183	21AUG06:00	16DEC06:00	T	0530PM	0815PM	NC	NORTH CLASSROOM BUILDING	1207	3.3	201.3	96	64%
ARCH5360001	1	Grad	STRUCTURES II	LECTURE	55	165	21AUG06:00	16DEC06:00	TR	0830AM	0945AM	NC	NORTH CLASSROOM BUILDING	1207	3	165	96	57%
JRP 5530001	1	Grad	PLANNING LAW	LECTURE</														

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Student contact hours = course enrollment \* weekly meeting hour

CourseID	CRS_SEQ	CourseLevel	CRS_TRM_TITLE_DESC	ACTIVITYTYPEDESC	Comb Enrl	Comb SCH	MeetStartDate	MeetEndDate	MEETING DAYS	STARTTIME	ENDTIME	BLDG CODE	BLDG	ROOM	duration_h our_adjust ed	StuContact Hours	SISRoomC apacity	PctOccupied
ARCH6170002		Grad	ADVANCED DESIGN STUDIO			60												
ARCH6170003		Grad	ADVANCED DESIGN STUDIO			64												
ARCH6170004		Grad	ADVANCED DESIGN STUDIO			64												
ARCH6170005		Grad	ADVANCED DESIGN STUDIO			52												
ARCH6171001		Grad	ADVANCED DESIGN SEMINAR			30												
ARCH6171002		Grad	ADVANCED DESIGN SEMINAR			30												
ARCH6171003		Grad	ADVANCED DESIGN SEMINAR			32												
ARCH6171004		Grad	ADVANCED DESIGN SEMINAR			32												
ARCH6171005		Grad	ADVANCED DESIGN SEMINAR			26												
ARCH6840900		Grad	IS: DESIGN-BUILD CONSTRUCTION	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840901		Grad	IS: AFFORDABLE HOUSING BUDGET EFFICIENCY	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840902		Grad	IS: GOTHIC ARCHITECTURE AND ICONOCLAST ISSUES	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840903		Grad	IS: GRAIN ELEVATOR RESEARCH	INDEPENDENT STUDY	2	6	21AUG06:00	16DEC06:00										
ARCH6840904		Grad	IS: TOPICS IN HISTORIC PRESERVATION	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840905		Grad	IS: TRAILER WRAP	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840906		Grad	INDEPENDENT STUDY:	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840907		Grad	IS: STUDY OF CHICHEN ITAC & MAYAN CULTURE	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH6840908		Grad	IS: ACE MENTORING	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
ARCH68910800		Grad	TEACHING ASSISTANTSHIP	PRACTICUM	1	3	21AUG06:00	16DEC06:00										
ARCH68910801		Grad	TEACHING ASSISTANTSHIP	PRACTICUM	1	3	21AUG06:00	16DEC06:00										
ARCH68930800		Grad	ARCHITECTURE INTERNSHIP	INTERNSHIP	19	54	21AUG06:00	16DEC06:00										
ARCH68931800		Grad	ARCHITECTURE INTERNSHIP	INTERNSHIP	7	21	21AUG06:00	16DEC06:00										
ARCH68950901		Grad	THESIS PREPARATION	DISSERTATION/THESIS	1	3	21AUG06:00	16DEC06:00										
ARCH68950902		Grad	THESIS PREPARATION	DISSERTATION/THESIS	1	3	21AUG06:00	16DEC06:00										
ARCH68950903		Grad	THESIS PREPARATION	DISSERTATION/THESIS	1	3	21AUG06:00	16DEC06:00										
DSPL7002001		Grad	PHD: SEM: DSGN, PLANNG THEORY/METHODOLOGY II			14												
DSPL7840900		Grad	IS: RESEARCH METHODOLOGY	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
DSPL7840901		Grad	IS: INTERPRETATION	INDEPENDENT STUDY	1	1	21AUG06:00	16DEC06:00										
DSPL7840902		Grad	IS: SUSTAINABLE DEVLPMNT AND HUMAN BEHAVIOR	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
DSPL7840903		Grad	IS: EVOLUTION OF BARCELONGA CITY FORM	INDEPENDENT STUDY	1	2	21AUG06:00	16DEC06:00										
DSPL7840904		Grad	IS: PLANNING THEORY READINGS	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
DSPL7840906		Grad	IS: DISSERTATION PROPOSAL & LIT REVIEW	INDEPENDENT STUDY	1	1	21AUG06:00	16DEC06:00										
DSPL7840907		Grad	IS: PEDAGOGY OF ADAPTION AND INNOVATION	INDEPENDENT STUDY	1	1	21AUG06:00	16DEC06:00										
DSPL7950901		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	3	25	21AUG06:00	16DEC06:00										
DSPL7950902		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	3	13	21AUG06:00	16DEC06:00										
DSPL7950903		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	1	5	21AUG06:00	16DEC06:00										
DSPL7950904		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	2	9	21AUG06:00	16DEC06:00										
DSPL7950905		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	2	10	21AUG06:00	16DEC06:00										
DSPL7950906		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	1	5	21AUG06:00	16DEC06:00										
DSPL7950907		Grad	DOCTORAL THESIS RESEARCH	DISSERTATION/THESIS	1	5	21AUG06:00	16DEC06:00										
LA 5502001		Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 2			81												
LA 6606001		Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 6			99												
LA 6609001		Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 9			63												
LA 6610001		Grad	LANDSCAPE ARCHITECTURE DESIGN STUDIO 10			66												
LA 6840900		Grad	IS: DRAWING THEORY AND TECHNIQUES	INDEPENDENT STUDY	2	6	21AUG06:00	16DEC06:00										
LA 6840901		Grad	IS: ANIMATION THEORY FOR LANDSCAPE ARCH	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840902		Grad	INDEPENDENT STUDY: L A	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840903		Grad	IS: AUDIO EDITING KATRINA	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840904		Grad	IS: CONVENTION CENTER LA DESIGN	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840905		Grad	IS: THESIS PREP	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840906		Grad	IS: SUSTAINABLE DESIGN IN LA	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840907		Grad	IS: THESIS	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6840908		Grad	IS: DESIGN STRATEGIES	INDEPENDENT STUDY	1	3	21AUG06:00	16DEC06:00										
LA 6930800		Grad	L A INTERNSHIP	INTERNSHIP	7	21	21AUG06:00	16DEC06:00										
JRP 6686002		Grad	ST.GRAPHICS FOR PLANNERS			48												
JRP 6840900		Grad	IS-PRESENTATION THEORY AND PRACTICE	INDEPENDENT STUDY	4	12	21AUG06:00	16DEC06:00										
JRP 6930800		Grad	PLANNING INTERNSHIP	INTERNSHIP	1	3	21AUG06:00	16DEC06:00										
JRP 6930801		Grad	PLANNING INTERNSHIP	INTERNSHIP	4	12	21AUG06:00	16DEC06:00										
JRP 6930802		Grad	PLANNING INTERNSHIP	INTERNSHIP	1	3	21AUG06:00	16DEC06:00										
JRP 6930803		Grad	PLANNING INTERNSHIP	INTERNSHIP	1	3	21AUG06:00	16DEC06:00										
JRP 6950900		Grad	THESIS RESEARCH AND PROGRAMMING	DISSERTATION/THESIS	1	3	21AUG06:00	16DEC06:00										

Fall 2006 UCDHSC D1 course meeting hours, A&P COURSES ONLY (COURSE OFFERING COLLEGE = AP)  
OIRPA, DD. Source: I:\OIRPA\CU System\Requests\Campus Utilization Rates\ClassrmSpaceUtil18.sas

Column Descriptions for the CourseDetail tab

<b>CourseID</b>	Course ID number (subject, course number, section number)
<b>CRS_MEET_SEQ</b>	Meeting pattern sequence number (if multiple). Missing if
<b>CourseLevel</b>	Course is undergraduate or graduate level
<b>CRS_TRM_TITLE_DESC</b>	Course title
<b>ACTIVITYTYPEDESC</b>	Course activity type (method of instruction) as listed on SIS.
<b>CombEnrl</b>	Course enrollment at the end of the term. All enrollment for combined sections is shown in the sponsor course.
<b>CombSCH</b>	Student credit hours at the end of the term. All SCH for combined sections is shown in the sponsor course.
<b>MeetStartDate</b>	Start date of the meeting pattern
<b>MeetEndDate</b>	End date of the meeting pattern
<b>MEETINGDAYS</b>	Days of the week for this meeting pattern
<b>STARTTIME</b>	Starting time of day for this meeting pattern
<b>ENDTIME</b>	End time of day for this meeting pattern
<b>BLDGCODE</b>	Building code listed on SIS
<b>BLDG</b>	Full name of building listed on SIS
<b>ROOM</b>	Room listed on SIS
<b>duration_hour_adjusted</b>	Number of hours of meeting time for this meeting pattern, calculated as minutes / 50. Missing for courses with no classroom meeting pattern (e.g., online courses)
<b>StuContactHours</b>	Hours of meeting time multiplied by course enrollment (duration_hour_adjusted * CombEnrl)
<b>SISRoomCapacity</b>	Room capacity as listed on SIS room inventory, with some adjustments and corrections to match the Fall 2006 classroom utilization analysis prepared for CU System Budget Office in June 2007.
<b>PctOccupied</b>	Percent occupancy of the room for this meeting pattern (enrollment / capacity)

## **Appendix C. Facilities Audit Report for CU-Denver Building**

# Facilities Audit

UCDHSC Facilities Operations Department

Engineering Programs, Prepared by Scott Roen, P.E.

Controlled Maintenance & Facilities Audit Program

Provided for State Buildings & Real Estate Programs

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July 2006

CU-Denver Building (DRAVO)

Downtown Denver Campus

# Report Content

- Facilities Audit Summary Report
- General Facilities Audit Process
  - Background
  - Audit Methodology
- Facilities Audit Narrative
- Deferred Maintenance Projects
- List of Supporting Documents
  - Problem List (active on-going database)
  - Inspection Forms
  - Calculation Page/Cost Estimates (spreadsheet)
  - Other Appendix Items (typically not attached to this e-document)

# Facilities Audit Summary Report

**Building Name:** CU-Denver Building (DRAVO)  
**Campus/Location:** Downtown Denver  
**Occupancy Type:** office, student auditorium, records storage, computer-server  
**Gross Space (sq ft):** 159,573  
**Number of Levels:** 8  
**Year Built:** 1977  
**Year Remodeled:**  
**Date Inspected:** July 2006

**Building Estimated Current Replacement Value (C.R.V.):** \$ 17,495,134

## Summary: Assessment Rating & Deficiency Cost

Building Component	System Deficiency Rating	Building Component Multiplier	Component Value (C.R.V.)	Estimated Cost of Deficiency
Building Structure	83%	0.31	5,423,492	949,111
HVAC Systems	26%	0.40	6,998,054	5,150,567
Plumbing Systems	71%	0.07	1,224,659	355,764
Electrical Systems	74%	0.15	2,624,270	675,750
Code Compliance & Safety	52%	0.07	1,224,659	590,163

100%=Perfect

**Total: \$ 7,721,355**

Facilities Condition Index  $(1 - (\text{Deficiency}/\text{C.R.V.})) \times 100 = \text{F.C.I.}$

$$\text{F.C.I.} = \frac{\text{Cost of Deficiency}}{\text{C.R.V.}} = \frac{\$ 7,721,355}{\$ 17,495,134} = \mathbf{55.9\%}$$

Percent Change from Previous = -x.x %

## Focuses Critical Need:

To achieve the greatest impact, define the Building Component that will be emphasized

Fire Protection/Life- Safety, HVAC – VAV-reheat

# General Facilities Audit Process

## Background

The Facilities Audit is a building condition assessment process, developed specifically for University of Colorado at Denver and Health Sciences Center facilities, though largely modeled after industry standard guidelines - primarily APPA (“The Association of Higher Education Facility Officers” and from information provided by State Buildings and Real Estate Programs – SBREP). The Facilities Audit is used to rapidly evaluate the physical condition of existing buildings and campus infrastructure.

The Facilities Audit is the starting point for identifying deficient assets that comprise the campus complex. This process starts with fact-finding and quantitative grading that leads to project planning and prioritizing, and then finally project development and recommendation.

There are two main objectives of the Facilities Audit Program. First, a methodical approach for surveying building conditions was necessary to allow comprehensive Controlled Maintenance project planning. This survey process was intended to be broad in nature, generally identifying maintenance deficiencies that could be developed into corrective projects. The audit is completed periodically – generally over a 3 year cycle. Also, the Facilities Audit is intended to produce standardized building condition information, enabling meaningful comparisons within an inventory of similar building types or functions. Comparative grading allows ranking and prioritizing based on relative condition and allows Controlled Maintenance planning based on objectively applied criteria of condition. This comparative approach should lead to an improved ability to prioritize the greatest maintenance needs.

The Facilities Audit will result in quantifiable grading as expressed in an FCI number (the Facilities Condition Index, which is the cost ratio of maintenance deficiencies within the building, divided by the estimated cost of replacement for the building - one minus this ratio allows a large percentage figure to indicate an excellent condition). The FCI number should assist with prioritizing needs.

$$\text{FCI} = 1 - \frac{\text{Cost of Maintenance Deficiencies}}{\text{Current Replacement Value}}$$

The second main objective is to develop a list of maintenance problems. The listing of deficiencies will help provide detail for developing potential projects. Then this information is used to prepare a list of top priority deferred maintenance projects. Included in this project database is an estimate of project costs. The projects in this list are then prioritized to identify major maintenance needs. Using consulting services, greater detail will be developed in preparing for future Controlled Maintenance projects.

## **Audit Methodology**

The Facilities Audit assesses building condition to identify a “snap-shot” of maintenance problems in the various campus buildings. The audit draws upon data that basically already exists, though may be in various forms laid out over several years. It relies upon theoretical life spans and broad estimating rates for replacement valuations. Building component condition grades are translated to theoretical costs - comparing the cost of new versus old, expressed as a percentage as expressed in the grade.

Emphasis is placed on site walk-through and visual inspection of condition, interviews and discussion with operating staff, and review of any past consulting reports. Previous projects are reviewed. Current operating and maintenance problems are discussed. The results provide a broad-brush assessment of building sub-component condition.

This information is most valuable when used in a comparative manner. The audit should identify the problems on a building component basis. Then comparing component deficiencies of one building to other campus buildings allows for a quantitative understanding of priority problems.

### **Building Condition Survey**

The Facilities Audit Program uses an inspection team – made up of building trades experts (supervisors, foreman, and work leaders) – who are each responsible for one of the five predetermined major building construction components, these are: Building Structure, HVAC Systems, Electrical Systems, Plumbing Systems, and Code Compliance & Life Safety Systems.

Each building component is broken down into several sub-components. The building sub-component definition remains consistent for each similar building on campus - thereby allowing for comparative evaluation. Each building sub-component is graded using simplistic criteria, such as: Good, Fair, Needs Work, Poor (with graduation between these relative expressions of condition).

The inspection team members complete a building walk-through survey and fill-out a “Facilities Audit Inspection Form” for each building that is audited. This grading form asks questions about life safety issues, potential system failure issues, and asks questions about the condition of sub-components in the building. Also, the evaluator lists observed top-priority maintenance problems (it is emphasized to the audit team to make this list of maintenance problems as detailed and comprehensive as possible – this forms the beginning of the deferred maintenance project database).

There three general approaches to conducting the building inspection. These are generally referred to as: fly-by, walk-through, or crawl through. Each approach has a differing degree of detail and conversely a differing amount of time commitment and money.

## **Building Component Grade**

The building sub-components are graded in a simplistic manner in order to obtain a broad understanding of building condition. These grades, when compared to other buildings, allow for prioritization of need. Greater detail is necessary to develop projects. Generally, each grade is defined as shown:

- **Poor Condition** – Building component should be replaced and/or an extensive renovation project is required to correct obsolescence of a nonfunctioning system.
- **Needs Work** – Building component could be corrected with extensive renovation. The system appears to be working, but modernization is needed to upgrade the system. The component has surpassed its expected useful life.
- **Fair Condition** – Building component is functioning, but is in need of maintenance work. The component is approaching the end of its useful life.
- **Good Condition** – Routine and preventive maintenance should be continued to keep the building component in good working order.

Each building sub-component is graded by the audit team. These grades are discussed during the post-walk-through meeting. Specialists attend this meeting as necessary to comment on unique circumstances or reoccurring maintenance problems. The sub-component grades and maintenance problems are listed and fine-tuned during the discussion. Each grade is assigned a point value, from one to four including fractional amount if applicable, and a weighted-average is calculated and reported as a percentage.

The inspection grade is further modified by additional criteria obtained during the building survey. Specific questions are used to address potential life safety problems, to address the possibility of a major system failure that could result in disruption of building operation, and to address the comparative nature of the condition of this particular sub-component with respect to other campus buildings. This additional criteria is used to adjust the final grade and to assign preliminary cost estimates.

## **Cost Estimates**

The grade is used to arrive at an estimated cost of deficiency. The audit team does not complete project cost estimates in the field – although cost concerns are discussed at the post-walk-through meeting. Cost estimates are obtained indirectly. Knowing the approximate replacement value of the building (estimated on a per square foot basis) and the approximate value of the building component (estimated as a percentage of the overall building value with consideration for occupancy type), then the cost of building deficiencies is determined empirically. Using the component grade and a practical understanding of building component replacement, the cost of the deficiency is estimated. Assuming the relative condition of the building sub-component is directly related to the cost of repairing this sub-component, then an approximate cost of deficiency can be assumed. This cost data does not make up the project cost estimates, which are analyzed separately as individual stand-alone projects (using consulting services when necessary for priority projects). However, this cost data should provide general guidance when identifying the associated cost of all the prioritized deferred maintenance projects within the building. This cost data is used to calculate the Facilities Condition Index (FCI). The

FCI ratio is a useful gage when comparing buildings across campus. Also, the FCI number is used to prioritize potential Controlled Maintenance projects.

### **Deferred Maintenance Projects**

The second main objective of the Facilities Audit Program is to use the audit data to help identify future projects. Each building has a listing of maintenance problems that is developed into a database of top priority deferred maintenance projects. This listing of deficiencies will help provide detail for developing potential projects. Maintenance deficiencies in and of themselves, are not complete projects. Generally, similar maintenance problems are logically grouped together to create potential projects. These preliminary projects are expanded to reflect complete project development requirements, such as: consulting services, contractor mobilization, contractor overhead & profit, project closeout, commissioning, and owner contingency. Initially, an approximate deficiency markup of about 35% is used in preparing for potential projects. High priority projects are further developed by using consulting services. These projects are candidates for inclusion in the Controlled Maintenance Five-Year Plan.

# Facilities Condition Narrative

The overall goal of this report is to establish a short list of top priority improvement projects that will begin to correct on-going facilities deficiencies. And to identify the relative condition of the facility - for comparative purposes - as expressed in a quantifiable grade – the F.C.I. number. The State Buildings and Real Estate Programs (SBREP) uses the Controlled Maintenance process to fund facilities improvement projects, and the basis for prioritizing projects is the Facilities Audit.

The CU-Denver Building was recently acquired as an asset under ownership of the CU System, even though this building has been continually occupied by university programs over a long time period. The long term space lease arrangement placed the university as a de facto owner without holding title to the property. Over the long term the university has provided all building operating and maintenance services, including some capital improvements and paying for all required utilities. At this point of transition, long term capital renewal should be considered.

The 1977 constructed, 8 floor building (with associated Annex building) is showing its age and is in need of improvements. An important early consideration is an agreed upon master-plan process for identifying the long term versus short term direction of facilities improvements (this report is unable to fully address this need for “planning direction” nor to provide full detail on all recommended projects).. It is potentially a mistake to undertake quick maintenance projects in a piece-meal fashion without understanding the big picture – thereby requiring removal/alteration of recent work. In some cases work could begin rapidly, such as on Fire Protection/Life Safety projects that need to happen one way or another. On the other hand, space heating and cooling needs as provided through an air-side HVAC system versus a water-side HVAC system need early resolution.

## **HVAC Improvements: water-side equipment versus air-side equipment**

The audit process attempts to consider replacement of deteriorated building components with similar modernized systems. In reality new more advanced technology would make this simple replacement less valuable. The more likely approach to replacing old equipment would be to take advantage of new more energy efficient systems and in some cases systems that better accommodate the current space function.

This is precisely the case for this building and especially for one of it’s the top priority needs - 1<sup>st</sup> floor heating and cooling improvements. The original space use consisted of tenant-leased retail/restaurant operations. Due to changing needs and poorly renovated changes over the last 30 years, the 1<sup>st</sup> floor HVAC system is in poor shape. The current unventilated 4-pipe/single-coil fan coil system should be completely replaced (the audit assume replacement with like system – estimate about \$230,000). The preferred replacement project would be for a VAV-reheat air delivery system. To make this type of improvement would require a building wide capital renewal effort driven by a long

term master plan. This first major decision point of water-side HVAC (similar to existing) versus a more suitable air-side HVAC system needs resolution (for comparative purposes, for the 1<sup>st</sup> floor only, plus additional AHU ductwork/miscellaneous improvements – estimate about \$240,000; however these miscellaneous improvements help to correct other problems in 2<sup>nd</sup> – 8<sup>th</sup> floor HVAC; allowing for greater value).

### **Improvement Strategy**

Various maintenance improvement projects will help extend the life of the major building systems – including basic preventative maintenance practice. There are several large scale projects that must be considered as capital improvements. A strategic plan is necessary to define direction for undertaking facilities improvements. The traditional operations and maintenance budget will not be sufficient to correct the large scale nature of the problem. SBREP has a “Capital Renewal” program that could be considered. Generally a Controlled Maintenance project – or any phase of a CM project – that exceeds two million dollars would be a candidate for capital renewal funding. Project requests of this type should first be submitted to CCHE as a capital construction project (including explanation of why this project is “maintenance driven” and not “program driven”).

Performance contracting may also be considered – using future energy savings to obtain funding to pay for major renovation through an ESCO (Energy Services Contractor). It is generally understood that the project loan must be backed by a CU treasure obligation, though no cash outlay is required.

The following information describes facilities deficiencies of the building components.

### **Building Code, Life Safety, Hazardous Materials**

An existing older facility is generally exempt from changing codes and regulation as new understanding changes over time. This is as long as the existing structure remains unchanged. As alterations, renovations, and especially expansion is considered, often time the existing structure must be updated. Also many facilities that serve the general public voluntarily modernize or otherwise attempt to meet existing building code requirements. The CU-Denver Building is in great need of correcting code deficiencies.

### **Fire Protection & Life Safety**

As a priority need, an emergency power generator should be installed to serve the fire pump and should be sized large enough to feed emergency exit lighting (which would allow for the removal of battery operated exit lights – and ongoing O&M cost). Included in this project is a need for ATO switchgear to transfer power in the event of utility power interruption.

Egress problems are another need that must be addressed. At the Annex Building, there is a “stairway to no where”. Apparently there was previous work that may have been done for security reasons. At that time, a metal pan was installed with poured concrete

on top that blocks entry to the first floor, thereby creating a dead-end corridor. This is in violation of fire code and needs to be corrected.

Another fire protection improvement is a required upgrade to the elevator recall system. Upgrades are required per code to improve the current system. Denver Fire Dept defines Phase 1 and Phase 2 improvements. Phase 1, which returns the car to the ground floor has been done; Phase 2 which allows the fire department to control the elevator through use of a fire key may need to be completed in the future.

### **Public Refuge Area**

Providing areas of refuge may be code required, though additional work needs to be done in this area, especially existing conditions investigation. The integrity of fire-rated barriers needs to be maintained. This may include space air pressure control for the refuge area - and/or just the elevator shaft. Apparently a fan/damper system was designed for pressurization of the elevator shaft (there are no fire-rated walls that could allow for pressurization of the elevator lobbies), though the integrity of this system has not been maintained. This problem must be corrected.

Most modern facilities meet code requirements through a sprinkler-system using booster pump pressurization, automatic heat-detected activation, and automatic notification to the local fire protection district serving the municipality. Additional features include pull-stations for hand activated emergency response, audible fire alarming and strobe lights, illuminated exit lights, and specially constructed egress paths (public corridors constructed with floor-to-ceiling structure participations to minimize smoke travel, special fire rated doors, and walls constructed with fire rated gypsum drywall board). These areas must be addressed by design and construction firms specializing in this area.

### **Miscellaneous**

General safety concerns that need ongoing attention include: exit lighting, fire-rated barriers (partitions extending to structure where required, eliminating holes in fire-rated partitions above the ceiling, insuring sprinkler head coverage, maintain egress passage, machine rooms may need to be sprinkled.

### **ADA Compliance:**

Public facilities are required to meet pertinent ADA regulations of the Americans with Disabilities Act to improve access for handicapped individuals. This building appears to have made adequate and reasonable accommodation – though there are several smaller items that need ADA attention and should be further investigated. The facility should make every reasonable attempt to ensure compliance with ADA requirements.

Apparently there is only one ADA accessible bathroom arrangement which is located on the 4<sup>th</sup> floor – this should be expanded (most bathrooms should be updated).

### **Hazardous Materials:**

Buildings constructed in the early 1970's or earlier often times have problems associated with pipe and duct insulation that has asbestos containing materials (ACM). This building was built in 1977 and consequently there is no evidence of asbestos problems.

### **Mechanical – HVAC (heating, ventilation, and air-conditioning)**

The HVAC building components greatly impact occupant comfort and have large energy consumption consequence. Basic operating strategies may have energy conservation value (simple control strategies should be automated, such as time clocks, thermostat set-back, turning off lights, etc. - this could all save energy dollars).

#### **1<sup>st</sup> Floor & Annex HVAC**

There are approximately 25 four-pipe fan coil units serving this area (each unit consists of only one coil that attempts to provide heating or cooling – not both at the same time – this single coil results in water mixing and poor temperature control with great energy waste). These units are beyond repair and require replacement.

The control valve at each fan coil unit is defective and allows mixing of hot water with chilled water return. This mixing places an artificial load on the chiller increasing energy consumption and affecting occupant comfort. The fan coil units operate continuously and do not shutdown during unoccupied hours. This system must be replaced, though an alternate system should be considered prior to implementing a replacement program.

This area would be better served by an air-side HVAC system and would allow for code required ventilation improvements and energy conservation improvements – including improved temperature control. Air-side equipment refers to an HVAC system that uses air as the primary medium for transferring thermal energy. Central equipment located in the penthouse is used to condition and then distribute air through ductwork. The air-handling-unit (AHU) consists of chilled water coils, heating water coils, fans, etc. Water-side equipment uses piping to distribute chilled water and heating water to many small local units consisting of coils and fans (ventilation air is not distributed and temperature control fine-tuning is accomplished by local hot water reheat coils for each zone).

The area should be served by a VAV-reheat system, though extension of the existing air system serving the floors 2 through 8 may be difficult (further investigation should be considered). The Annex would be best served by its own roof-top mount AHU. Extending the existing system would be preferred but several system components may need to be upgraded (though upgrade may be necessary due deterioration as it is a 30-year old system). If then central system is not expanded, then the first floor will need its own AHU. Location will be difficult – including duct runs to bring in ventilation air from the outside.

As discussed previously, an important decision point is resolution of how to proceed with 1<sup>st</sup> floor HVAC improvements – air-side HVAC or water-side HVAC. Considering a like-for-like replacement assumes the provision of fan-coil-units (2 coils) – not

recommended. Using a VAV-reheat system is preferred, but more complicated and has greater reliance on building-wide improvements (increased risk due to greater unknown conditions). The first significant consideration involves how to get more air supplies to the 1<sup>st</sup> floor where needed ductwork does not exist. Additional related concerns are many, including: supply fan capacity and capability (cfm/static-pressure/motor-horsepower), AHU ancillary equipment (chilled water/heating water), access to building shafts/chase allowing for ductwork extension, etc. Additionally, as increase ventilation air is brought into the AHU and then delivered to the space, building pressure relief must be considered.

### **Ventilation & Outside Air Economizer**

Code required ventilation air may not be adequate and is not provided on the 1<sup>st</sup> floor (original 1<sup>st</sup> floor function as retail/restaurant). In addition to ventilation for occupant health is the need to consider energy conservation. Using damper arrangements to bring in greater amounts of outside air when its temperature is advantageous to the AHU process can help minimize energy costs (or the opposite of bring in less air if at outside air temperature extremes). This is referred to as the air-economizer-cycle and is non-existent in this building.

The current AHU arrangement has no economizer though there is sufficient wall and louver space for outside air and the relief side of an economizer system. Dampers, actuators/controls, and return/exhaust fans are required. This is a basic energy conservation measure. (Also, water-side at the cooling tower should be considered to enhance the free cooling mode of HVAC operation.)

### **HVAC Piping**

Especially related to the 1<sup>st</sup> floor fan coil units, but also the existing reheat system on floors 2<sup>nd</sup> – 8<sup>th</sup> is the HVAC piping (also any building improvements will be impacted by the piping). The heating water piping and chilled water piping distribution system through out the building is in poor shape – especially on the 1<sup>st</sup> floor. During a recent maintenance project, isolation and shutoff valves were installed at several locations. This work allowed for a view into the piping that clearly indicated great corrosion problems and piping deterioration (due to mixing of hot and cold water and the failed thermal expansion system, water chemistry has been greatly compromised, lead to corrosion problems). This entire system will most likely need replacement, including ancillary equipment.

### **2<sup>nd</sup> – 8<sup>th</sup> Floor HVAC**

Conditioned air from the penthouse AHU is delivered to various zones via a terminal unit configuration referred to as a Z-box. Apparently the Z-box is similar to a VAV-reheat box, though it was a contractor-proprietary device that has been very problematic. These boxes are original equipment and are difficult to maintain due to lack of replacement parts. There have been numerous tenement-finish renovations that were insufficiently designed resulting in inconsistent use of the base HVAC infrastructure and a mixed-match temperature control zoning. Perimeter baseboard hot water convectors are used for perimeter heating loads.

The Z-box terminal units should be replaced with a modern VAV-reheat system including a DDC control system.

### **Heating Water**

The original heating system used electric boilers (1,000 KW) that were discontinued some time ago. Most recently the building has purchased steam from Xcel Energy's downtown Denver district steam plant. They currently use steam-to hot water heat exchangers to provide the building heating. The cost of this utility is rising and it may be desirable for the building to invest in its own heating plant to save on future energy costs.

Approximately March 2005, UCDHSC procured consulting services through Shaffer-Baucom Engineering Consultants to further investigate the feasibility and boiler provision alternatives. The new boiler(s) could be installed in the roof top penthouse after the disassembly and removal of the old disabled electric boilers (including the shut down and removal of the city steam heat exchanger). The new boiler plant, with necessary controls, piping, electrical service, gas service, was estimated have a capacity of 2,000 MBTU/H heat input. The new gas line was to be routed through an abandoned grease exhaust shaft.

Significant findings of this investigation determined that a penthouse boiler retrofit would be unfeasible due to potential code violations. The existing boiler room exits to a refrigeration room and this manner of egress is not allowed by current buildings codes (both the City of Denver and the IBC codes) – additionally the space of the existing boiler room would not accommodate increased capacity boiler size.

Also noted in this feasibility study is that the existing building electrical equipment is located in the chiller room (this is also a violation of both codes). The building codes require that the only electrical equipment that is allowed to be located in this space is the electrical equipment that directly serves the chiller system, not building wide electrical service – this equipment should be in a separate room. Also the refrigeration room must be in a separate fire rated enclosure.

Therefore the study recommended an alter location for the new boiler. The proposed new location resulted in the construction of a new 1-hr fire rated boiler room in a penthouse location currently used as a portion of the building return air plenum. This is a reasonable alternative with an estimated June 2005 simple payback based on current energy use of about 8.3 years.

### **Air-Handling-Unit & Supporting Ancillary Equipment Replacement**

AHU equipment is old but in fairly good working order. An air economizer system should be considered. If the VAV-reheat system is expanded, AHU capacity will likely be impacted. If additional ductwork is added, especially at the far-end of the duct run, then the critical flow path will be altered and thereby change fan static pressure requirements (additional investigation will be necessary).

AHU supporting equipment must also be considered for upgrade. New boiler equipment is considered elsewhere, but additionally the heating water pumping system will need improvements. The system should be upgraded for variable flow and the current cross connection with the chilled water system must be eliminated. Expansion tank volume should be considered in conjunction with an improved water treatment program. Also the chilled water distribution system needs improvement including water-side free cooling provisions made at the cooling tower. Also, variable flow pumping, controls, water treatment must be corrected.

Water cooled chillers and the associated cooling tower may need to be modification - including bypass filtration on the condenser water loop.

## Mechanical – Plumbing

The plumbing systems include domestic potable water, water heating equipment, sanitary sewer piping, and roof drains/stormwater.

### **Miscellaneous**

The building needs a domestic water booster pump. Poor water pressure at penthouse is a problem and this makes it a slow process to fill the cooling towers. This may also result in the need to add PRV's at lower floors to regulate water pressure.

Also floor drains and branch sewer piping need to be cleaned out (use jet cleaner).

## Electrical

In general, the electrical system providing power to the facility is of sufficient capacity. Emergency power per a standby generator is an important consideration and is addressed in another section.

### **Miscellaneous**

Electrical safety through the use of ground-fault-interruption devices should be considered - put GFI's on the mains. Circuit breakers are all fused as would be expect for a 1970's building. Generally, the electrical system is in fair condition given its age.

There is a roof located transformer room (there is no roof on this enclosure). Xcel has complete ownership of this equipment (with lock& key). Also because the transformers are oil-filled, there is no stormwater drain and consequence a standing water problem.

Annual maintenance must continue including tightening lugs on all electrical connections and using an infra-red scanner as necessary to look for poor connections.

The domestic hot water heaters (qty of 2) use electric heating.

Recently a lighting upgrade project was completed for the 2' X 4' fixture that included electronic ballasts and T8 lamps.

## Building Structure

The building is structurally sound and well kept.

### **Miscellaneous**

The windows are in somewhat poor condition and replacement should be considered.

It is likely that all 4 elevators will need to be replaced at some point in the near future.

On the northeast entry to the building, the brick pavers are coming up in many places and present a trip hazard and the general condition of this entry area is somewhat unsightly. Corrective work is necessary in this area.

## Ancillary – IT (information technology & security)

To modernize the information systems physical plant, new category 5 cabling improvements are required. This work is straight forward and very necessary to transmit electronic data as required by the occupants of this facility.

The preliminary cost estimate of \$350 per FT of cable and covers about 1,100 FT is generally accurate. Therefore the project cost estimate is \$385,000.

## Previous/Recent Improvements

Not as an exhaustive listing, but some previous capital improvements have been completed in an attempt to update the facility. The following list includes some basic projects, but does not include smaller day-to-day operating improvements.

1. T-8 lighting upgrade
2. 8<sup>th</sup> Floor computer A/C (refrigeration) – split DX system
3. fire detection – “Silent Night” system
- 4.

# Deferred Maintenance Projects

## List of Potential Priority Controlled Maintenance Projects:

During the inspection and evaluation of the facility condition, several high priority projects were identified. These project suggestions may be further refined using architectural and/or engineering consulting services and then submitted as Controlled Maintenance projects.

Generally as an estimate, to create a stand-alone project definition, the identified maintenance deficiency cost is increased by about 35% to account for consulting services, contractor general conditions, project contingency, and other associated costs.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>Emergency Generator</b>	<b>\$ 185,000</b>

Upgrade the fire protection system to include an emergency power generator, fuel storage, automatic transfer switch suitable to provide backup power in the event of utility power interruption.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>Life Safety Improvements</b>	<b>\$ 227,900</b>

Insure egress pathways, provide fire-rated partitions from structure-to-structure where required by code, insure the integrity of fire-rated barriers by eliminating any holes, provide public refuge areas as required by code, including pressure control if necessary – through the provision of smoke control fans, dampers, and controls. Provide additional sprinkler heads in machine rooms and insure adequate sprinkler coverage throughout the building. Provide elevator recall as necessary and insure fire phones, door magnetic release, exit lighting, and all required fire/safety code provision.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>1<sup>st</sup> Floor HVAC Improvements</b>	<b>\$ 427,500</b>

Several HVAC improvements are necessary, though may need to be phased. The 1<sup>st</sup> floor fan coil system should be replaced with a VAV-reheat system. Air-handling-unit ductwork distribution will need to be extended to the first floor (this may be difficult and will need further investigation). This will require shaft/case space and may require AHU retrofit work (potentially a temporary AHU static pressure solution may allow phasing). HVAC piping will need to be replaced.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>HVAC Piping Improvements</b>	<b>\$ 230,000</b>

Several HVAC improvements are necessary, though may need to be phased. The heating water, chilled water, piping, expansion control, water treatment equipment must be replaced.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>2<sup>nd</sup> - 4<sup>th</sup> Floor HVAC Improvements</b>	<b>\$ 445,500</b>

Several HVAC improvements are necessary, though may need to be phased. The 2<sup>nd</sup> to 4<sup>th</sup> floor Z-box distribution system must be replaced with a new VAV-reheat system.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>5<sup>th</sup> - 8<sup>th</sup> Floor HVAC Improvements</b>	<b>\$ 595,000</b>

Several HVAC improvements are necessary, though may need to be phased. The 5<sup>th</sup> to 8<sup>th</sup> floor Z-box distribution system must be replaced with a new VAV-reheat system.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>Annex Rooftop Unit Installation</b>	<b>\$ xxx</b>

Several HVAC improvements are necessary, though may need to be phased. The Annex building needs its own rooftop unit to supply the building with a VAV-reheat system.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>New Boiler Installation</b>	<b>\$ 356,250</b>

Provide new hot water boiler in lieu of Xcel provided steam, remove old disabled boilers and heat exchangers, provide new boiler room, and gas service.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>AHU Replacement</b>	<b>\$ 244,950</b>

The air-handling-unit needs to be upgraded to serve the new/expanded VAV-reheat system (new fans may be required), provide air-economizer system with dampers, controls, return/exhaust fan, filtration, miscellaneous improvements.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>AHU Ancillary Equipment</b>	<b>\$ xxx</b>

The air-handling-unit needs to be upgraded, including supporting equipment hot water and chilled water coils, control valves, variable-flow pumping, DDC control system, and other miscellaneous improvements.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>AHU Ancillary Equipment: Chillers/Cooling Towers</b>	<b>\$ xxx</b>

The air-handling-unit needs to be upgraded, including supporting equipment such as chillers, cooling towers.

<b>Potential Project:</b>	<b>Cost Estimate:</b>
<b>IT Cable Replacement</b>	<b>\$ 385,000</b>

Provide new category 5 cable for data newtork.

## **Appendix D. Third-Party Review**

10 December 2007

Mr. Jerry Scezney  
Chief Planning Officer  
**University of Colorado Health Sciences Center**  
13001 East 17<sup>th</sup> Place  
Aurora, CO 80045-0508

Re: 3<sup>rd</sup> Party Review of Program Plan  
College of Architecture and Planning Building  
Project 200223.000

Dear Jerry:

This letter represents our third party review of the Program Plan for the College of Architecture and Planning Building, dated 25 October 2007. Our review focused on the feasibility of the project concept, consistency with the Auraria Higher Education Center Master Plan and reasonableness of the cost estimate and the project schedule.

#### Feasibility of the Project Concept

The Program Plan clearly identifies the justification for a new building for the College of Architecture and Planning based on increasing student enrollments, changing facility needs in response to evolution in the nature and direction of architecture and planning education, and limitations of the existing facilities. The positive impacts of the refocusing of the College Vision and associated curriculum changes can be seen in the marked increase in college fund raising and research grants within the last three years.

#### Consistency with the Auraria Higher Education Center Master Plan

The proposed site is in compliance with the 2007 Auraria Higher Education Center Master Plan. The five primary development principles of the Master Plan are as follows:

1. Expanding the campus to meet the current and future needs of the institutions.
2. Enhance the identity of the institutions.
3. Support the educational objectives of the three institutions, with specific emphasis of the student experience outside of the classroom.
4. Create strong connections from the campus to the core of downtown.
5. Adherence to the principles of sustainable planning and design.

The Program Plan recognizes the particular importance of these principles as they pertain to the College of Architecture and Planning and addresses each of them directly.

#### Cost

The proposed construction budget for building is \$28,370,681, or approximately \$236 per square foot. This is not a luxurious budget for a higher education building in today's construction market. Given the assumptions identified and thoughtful design as is warranted by the nature of the curriculum housed, and with both careful cost monitoring and fast track construction, the budget may be achievable. Any delays in construction start will negatively impact the ability to stay within the budgeted values. See accompanying estimate review by Cumming Corporation for further elaboration.



Mr. Jerry Sieczney  
University of Colorado Health Sciences Center  
10 December 2007  
Page 2

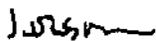
Schedule

The project schedule identifies one year for project design and two additional years to occupancy. Assuming that the space program included in the Program Plan remains relatively intact, these time frames are definitely achievable on a project of this nature and scale, particularly in light of the suggestion that a CM/GC process is anticipated. The CM/GC process normally incorporates fast track construction, with preliminary bid packages being issued prior to completion of the design documents. This process would offer the opportunity to foreshorten the overall design and construction schedule and potentially reduce overall project cost.

In summary, the Program Plan for the College of Architecture and Planning appears to be an accurate appraisal of the needs of the school and curriculum, with an achievable schedule and a tight budget.

Very truly yours,

**Fentress Architects**



Jeff Olson, AIA  
Principal

/dlr

encl: Program Estimate Peer Review dated 10 December 2007

c: Stefan Coca, Cumming Corporation

# CUMMING CORPORATION

**BUILDING VALUE THROUGH EXPERTISE**

**UC at Denver & Health Sciences Center**  
College of Architecture and Planning  
Denver, Colorado

Program Cost Peer Review  
December 11, 2007

Prepared for:  
**UC at Denver & Health Sciences Center**

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6901 SOUTH PIERCE STREET, SUITE 301, LITTLETON • COLORADO • 80128  
PHONE: 303-948-7224 • FAX: 303-948-7230

## Project Information Sheet

### A) General Info

Client:	UIC and the UIC Community Services Center
Project Name:	College of Architecture and Planning
Location:	Chicago, Illinois
Date:	2010
Job #:	
Milestone / Stage:	Preparation of RFP

### B) Indirect Costs

General Conditions (%):	2%
Bonds & Insurance (%):	2%
General Contractor Fee (%):	5%
Contingency (%):	5%
Contractor's Contingency (%):	5%

### C) Construction Dates

Start Date:	2010
Completion Date:	2011

**UC at Denver & Health Sciences Center  
College of Architecture and Planning  
Denver, Colorado  
Program Estimate Peer Review**

**Cumming Corporation**

**A Construction Cost :**

<b>Building Construction Cost</b>	<b>\$ 28,370,681</b>	<b>\$ 29,870,681</b>
at mid-point Construction 06/16/2010		
Total Building Gross Area	120,000	

<b>Cost per GSF today</b>	<b>\$ 208.95</b>
<b>LEED Impact 5% to 8% of Construction Cost</b>	<b>\$ 13.58</b>
<b>CM/GC total Mark-up 25.60%</b>	<b>\$ 50.01</b>

The total Direct Construction Cost of \$ 145.36/GSF of building is very optimistic for this type of high education building.  
The design team and the owner representative should follow very closely the desing process in order to achieve the maximum use of the funds.

<b>Sitework Construction Cost</b>	<b>\$ 1,500,000</b>
at mid-point Construction 06/16/2010	
Total Building Gross Area	120,000

<b>Cost per GSF at mid-point Construction</b>	<b>\$ 12.50</b>
<b>Cost per GSF today</b>	<b>\$ 11.05</b>
<b>LEED Impact 5% to 8% of Construction Cost</b>	
<b>CM/GC total Mark-up 25.60%</b>	<b>\$ 2.83</b>
<b>Total Direct Cost today</b>	<b>\$ 11.22</b>

The Sitework Direct Construction Cost is adequate if does not include any parking and/or special hardscaping features. The landscaping should be very minimal. The cost does not include any LEED items

Site utilities are only connection to the existing runs without special storm drainage requirements.

<b>AE Basic Services</b>	<b>\$ 3,285,775</b>
Percentage of Building Construction Cost	11.58%
Percentage of Total Construction Cost	11.00%

The cost is in line with similar projects on a Fast Track delivery system, and bid packages.

<b>Site survey and Code review cost</b>	<b>\$ 404,030</b>
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<b>F,F &amp; E Cost</b>	<b>\$ 4,844,700</b>
Is low for this type of project.	16.22%

<b>Miscellaneous Cost</b>	<b>\$ 997,414</b>
	3.34%

Is adequate for this project.

**Conclusion**

The Total Construction Budget for the College of Architecture at UC Denver & Health Sciences Center is possible with a very close control of the design and construction.  
Cumming Corporation review shows that the Direct Building Construction Cost is somewhat low, and a value of \$ 175.00/GSF will be more adequate.  
The College of Architecture and Planning includes two laboratories and some other spaces with special requirements. The Budget should reflect the special caracter of this building.