

The background of the lower half of the page features a large, dark gray watermark of the University of Utah seal. The seal is circular and contains the text 'THE UNIVERSITY OF UTAH' around the top edge and 'FEB. 28TH 1850' around the bottom edge. The seal is partially obscured by the text '3. Discovery'.

3. Discovery

Introduction

During the Discovery and Analysis phase of this process the University's current physical campus structure, buildings, infrastructure systems, transportation and transit use, housing needs and academic space assessment were examined.

It was the goal of this phase of the work to gain as much understanding regarding the campus' existing conditions and operations as possible in order to glean the major planning issues that needed to be addressed in a comprehensive campus master plan.

The documentation of the analysis phase of discovery is presented in one of three sections of this overall document. The analysis that can simply be reported and those recommendations that can be outlined in a summary fashion for further implementation strategies that will be discussed later in the book. The analysis is presented in this chapter.

When the analysis and information gathering defines a very specific problem or issue that has been addressed by the Plan, this document presents that analysis and observational material in the "Plan Elements" or "Transformative Projects" chapters. This chapter organization allows these issues and recommendation to be more closely tied. This decision also serves to minimize redundant information, which in a campus planning project of this size and complexity, would only serve to frustrate the reader.



The University of Utah 2008 (view east)

Campus Setting

Wasatch Mountain Range

The product of 20 million years of geologic faulting, volcanic activity, and glaciation, the Wasatch Mountains, the western range of the Rocky Mountains, stretch across Utah from the Bear River in the north to Mount Nebo near Nephi in the central part of the state. Most elevations along the range are generally between 9,000 and 10,000 feet; Mount Nebo is the highest peak at 11,877 feet. Some of the other significant peaks from north to south include Willard Peak, Mount Ogden, Bountiful Peak, Mount Olympus, Lone Peak, Mount Timpanogos, Provo Peak, Spanish Fork Peak, and Loafer Mountain.

Since the earliest days of Mormon settlement, the majority of Utah's population has chosen to settle along the range's western front, where numerous river drainages exit the mountains. The mountains were a vital source of water, timber, and granite for early settlers. Today they continue to serve as the primary source of water for the populous Wasatch Front, and to provide year-round recreational opportunities to residents and visitors alike.

(Source: The University of Utah, Utah History Encyclopedia - website)

Regional Context

The 1500-acre University of Utah campus is dramatically located at the foothills of a mountain valley with the Wasatch Mountains to the east and north. The Oquirrh Mountains border the western edge of the valley. Views from the campus are dramatic. The Oquirrh Mountains, Salt Lake Valley, and the Great Salt Lake, are clearly visible from many locations on campus.

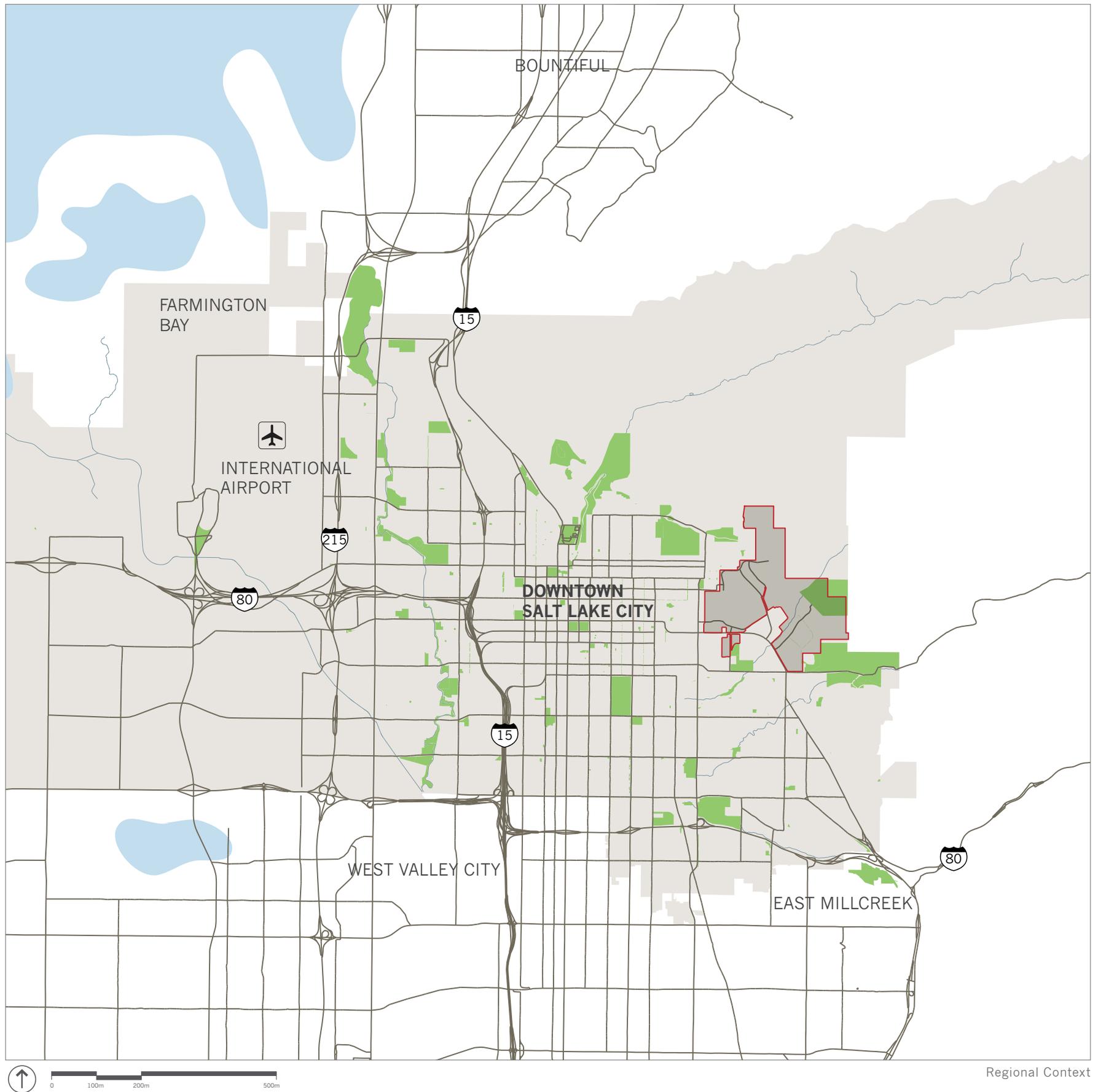
The campus is located approximately 2 miles east of downtown Salt Lake City. The City is located on land once covered by the prehistoric Lake Bonneville.

The eastern and northern portions of the City are located on a series of terraces, or former beaches, which are known locally as “the benches.”

The campus proper is bounded by 500 South, Foothill Drive, and Sunnyside Avenue on the south, University Street on the west, 100 South and North Campus Drive on the north, and the Wasatch Range foothills to the east.



Health Sciences Center



Salt Lake City by the numbers

In 2006 there were:

180,000 people living in Salt Lake City. 87,000 (48%) females and 93,000 (52%) males. The median age was 32 years old.

2.4 people living in Salt Lake City per household.

18% of the people living in Salt Lake City city were foreign born.

87% of people 25 years and over had at least graduated from high school and 40% had a bachelor's degree or higher.

Leading industries in Salt Lake City were educational services, health care, and social assistance, 23%; professional, scientific, management, administrative and waste management services, 14%.

69% of Salt Lake City workers drove to work alone in 2006, 14% car-pooled, 6% took public transportation, and 8% used other means.

Source: American Community Survey, 2006

City Context

The campus is located in a predominantly residential area of Salt Lake City. Adjacent neighborhoods are historic in nature and include Federal Heights to the north, and Yalecrest Historic District to the south. Both Federal Heights and Yalecrest were established during the early 1900s by officers based at Fort Douglas. The University-Neighborhood Historic District is located immediately to the west of campus and the Foothill/Sunnyside neighborhood (represented by the Sunnyside East Association) is located south of Research Park.

Significant non-university land uses located in close proximity to the campus include the following:

1. *Fort Douglas:* Fort Douglas was founded in 1862 and originally occupied over 2,500 acres of the Wasatch Range foothills. Today, the Fort is located on 51 acres within the University proper, situated between Research Park and Stilwell Field at Heritage Commons. The Fort is listed as a historic district on the National Register of Historic Places, and it is one of four active historic forts in the United States.

2. *Salt Lake University Institute of Religion (LDS Institute):* The Salt Lake University Institute of Religion occupies approximately 31 acres located on South Campus Drive along the southern edge of campus, adjacent to the Huntsman Center arena. In 2002, the Institute opened a 118,500 square-foot, three-level structure and parking for approximately 1,200 vehicles, within which the University leases parking.

3. *VA Hospital:* Located on 70 acres situated at Foothill Drive, the Salt Lake City VAMC is a 121 - bed tertiary care facility serving veterans residing within a 25,000 square mile primary service area.

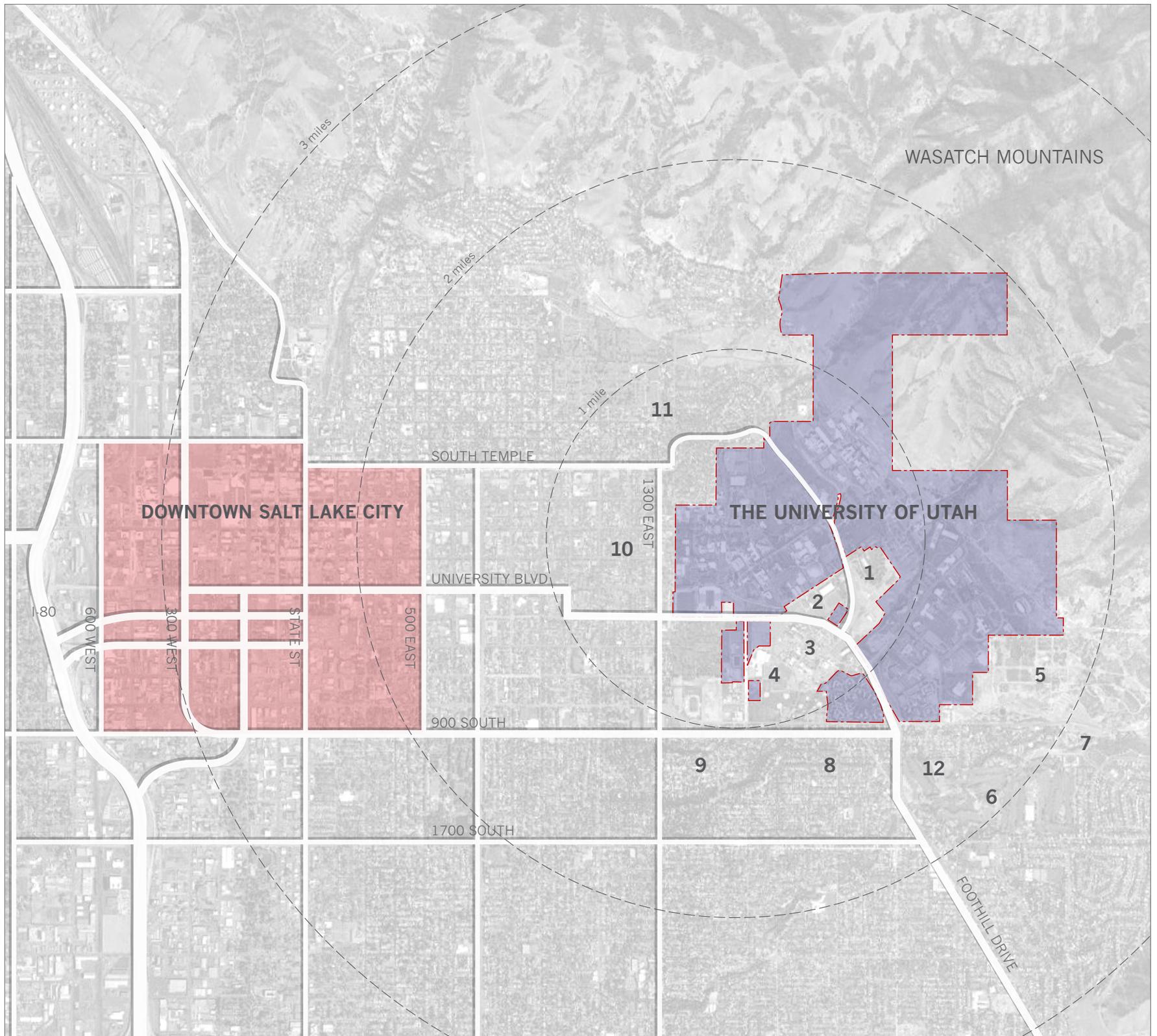
4. *Salt Lake City Sports Complex:* Salt Lake City Sports Complex and Steiner Aquatic Center was the official training venue for the 2002 Olympics. It includes two state of the art Olympic Ice Sheets, two Olympic-sized pools, and fitness facilities. The facility is owned and operated by Salt Lake County Parks and Recreation.

5. *This is the Place Heritage Park:* This is the Place Heritage Park is a living history site set within a 450-acre land area. It features more than 40 original and replica homes and businesses, complete with villagers who demonstrate crafts, trades and home-making skills typical of 19th Century Utah.

6. *Bonneville Golf Course:* Bonneville Golf Course is located on the East Bench of Salt Lake City. The course offers an 18 hole 72-par golf course, full-service practice facilities and on-site instruction.

7. *Hogle Zoo:* Hogle Zoo is located on a 42 acre site and its animal collection includes over 1,100 specimens of 250 species. The Zoo has been at its current location since 1931.

1. Fort Douglas
2. LDS Institute
3. VA Hospital
4. Salt Lake City Sports Complex
5. This is the Place Heritage Park
6. Bonneville Golf Course
7. Hogle Zoo
8. Foothill/Sunnyside Community Council
9. Yalecrest Community Council
10. University Neighborhood Historic District
11. Federal Heights Neighborhood
12. Sunnyside East Association



Salt Lake City Context

City Planning Policy Context

The adjacent map illustrates the Generalized Land Use Plan areas of Salt Lake City located in close proximity to The University of Utah campus. As shown, the University campus is surrounded by predominantly residential and open space uses. Residential development is predominantly low density, single family homes. Minor commercial uses are located immediately west of the campus on 1300 East. The majority of commercial development is situated in Downtown. A strip of commercial uses extends towards the campus along 400 South.

The University of Utah campus is located in the East Bench Community District of Salt Lake City. The Salt Lake City Planning Commission is charged with the legal responsibility to develop, through public participation, a comprehensive plan that provides guidance for community growth and development, including direction for land use issues and necessary capital improvements and programs for plan implementation. The City adopted the East Bench Master Plan in April 1987. The East Bench Master Plan places emphasis on “neighborhood maintenance and preservation.” Major goals of the East Bench Master Plan include the following:

- Maintain and enhance the community’s quality housing and residential neighborhoods;
- Preserve the present unique scenic beauty, environmental habitat, recreational use, and accessibility of the Wasatch foothills, and ensure city control over foothill development in the East Bench Community;
- Provide for needed community services while minimizing the impact of non-residential land uses on the residential community;
- Maintain an efficient circulation system that minimizes traffic volumes on local streets;

- Provide and maintain adequate and functional street, storm drainage, public utility, park and public safety systems; and
- Enhance the visual and aesthetic qualities and create a sense of visual unity within the community

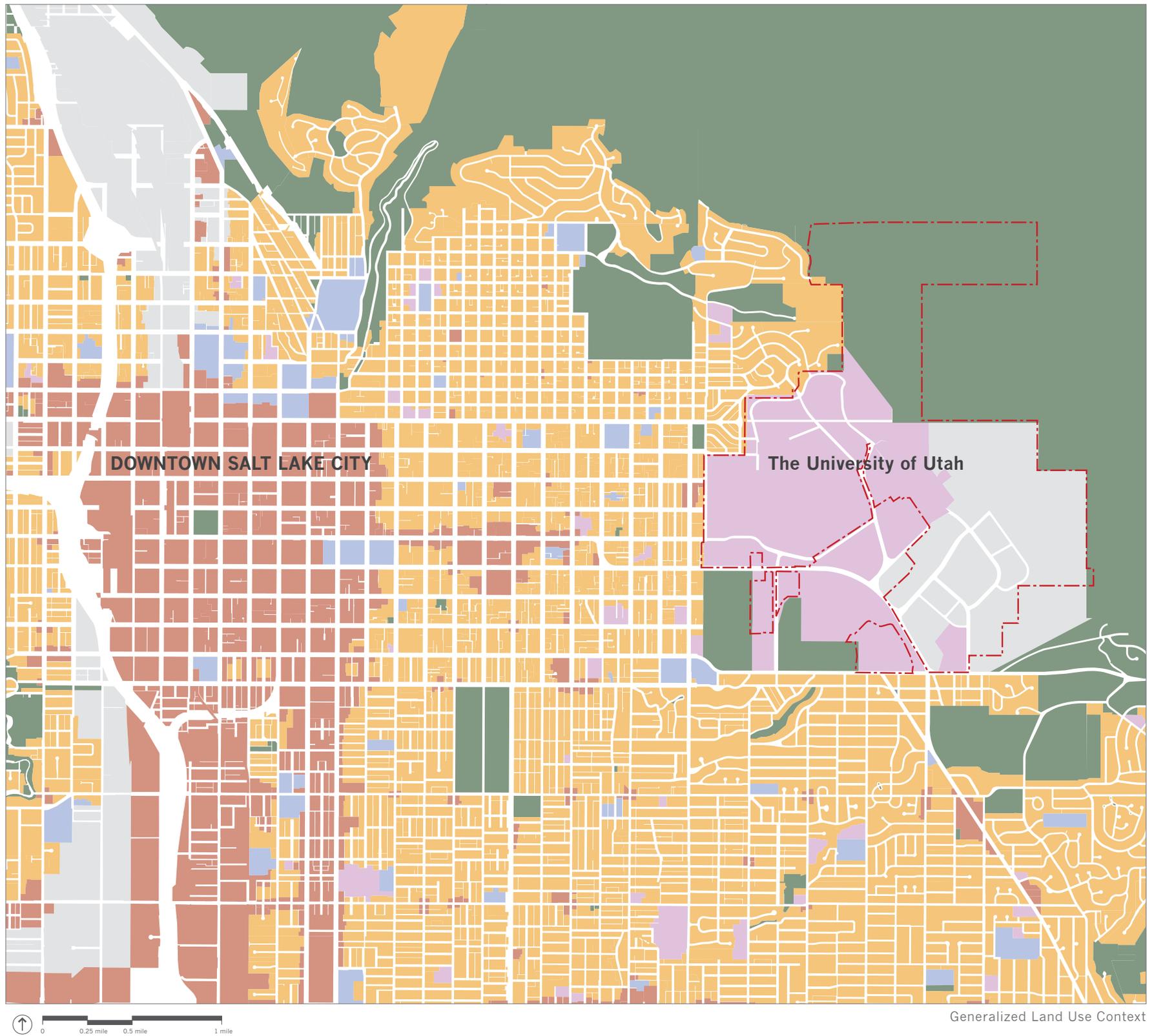
The University of Utah campus is located within three separate Salt Lake City zoning districts, including the Institutional District (21A.32.080 I) and the Research Park District (21A.32.020 RP), and the Open Space District (21A.32.100 OS).

Institutional District: The purpose of the Institutional District according to the provisions of the Zoning Ordinance is to regulate the development of larger public and semi-public uses in a manner harmonious with surrounding uses. The uses regulated by this district are generally those having multiple buildings on a campus like site.

Research Park District: The purpose of the Research Park District is to provide a nuisance free, campus like environment for high technology research and development uses and related activities.

Open Space District: The purpose of the Open Space District is to preserve and protect areas of public and private open space and exert a greater level of control over any potential redevelopment of existing open space areas.

 Commercial	 Institutional
 Residential	 Research / Industrial
 Open Space	 Civic / Public



Previous Planning Efforts

Long Range Development Plan (1997)

In 1997, a Long Range Development Plan (LRDP) was published by the University. The stated purpose of the LRDP was to provide “a comprehensive policy and land use plan to guide the growth and development of the campus... in a way that gives physical form to the University’s mission, vision, and academic program.”

The LRDP promoted the following land use and planning concepts:

- A Compact pedestrian-scale campus core to accommodate undergraduate education.
- Peripheral vehicular traffic/parking.

- Preservation of historic qualities and features.
- Ample student residences and recreation opportunities located conveniently in appropriate areas.
- Expansion and decentralization of student programs, services and recreation.
- A Generous open space network knitting the campus together.

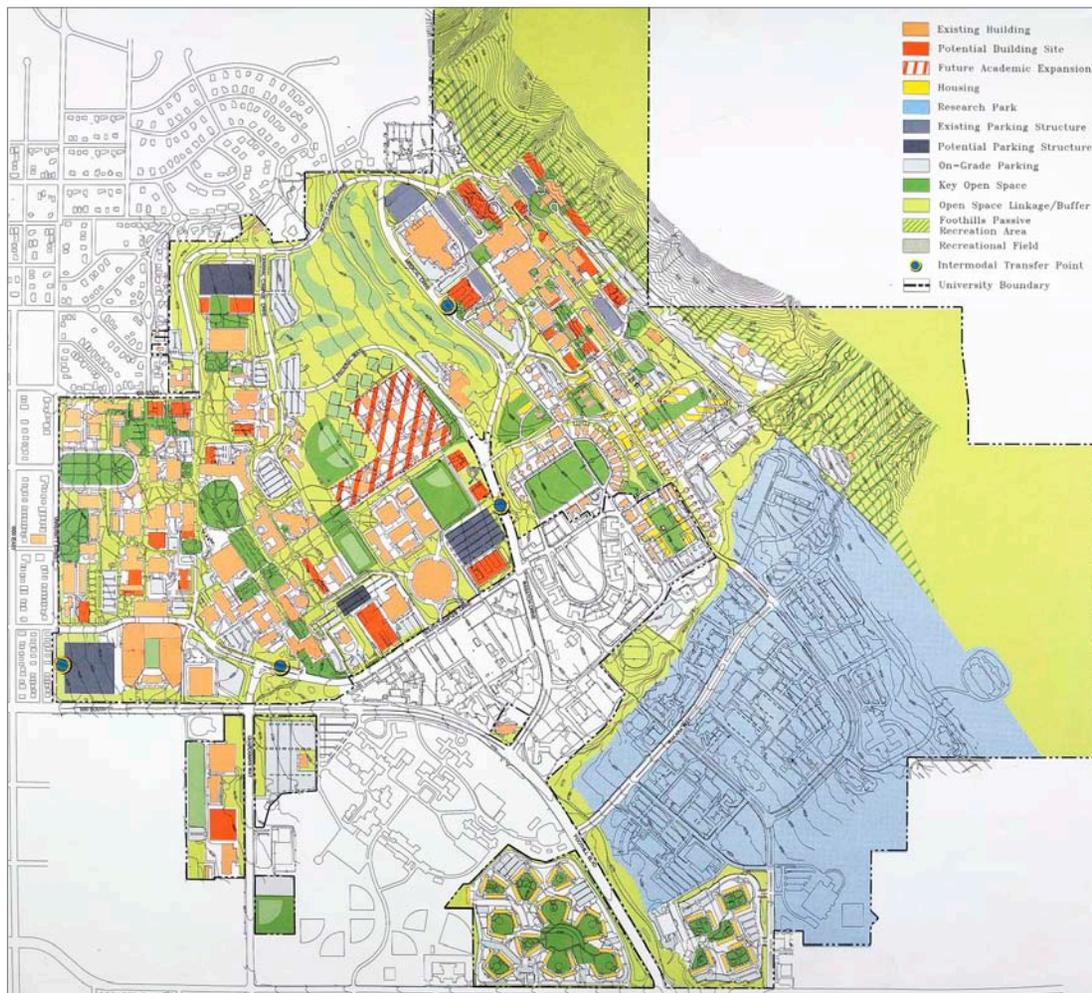
Significant land use proposals outlined by the LRDP included:

- Increase Academic (Research and Instruction) land use area from 86.7 acres to 120.0 acres.
- Increase Housing (including Parking) land use area from 90.0 acres to 141.9 acres.
- Reduce Designated open Space from 729.2 acres to 652.7 acres.

Long Range Development Plan Supplement (2003)

The University prepared in 2003 an update to its 1997 Long Range Development Plan (LRDP). According to the report, the update represented the first phase of inquiry and was intended to address immediate planning concerns and to inform the Strategic Planning process being undertaken at that time. It was intended that the vision that emerged from the Strategic Plan should guide a more comprehensive physical planning process.

One focus of the 2003 LRDP was the planning for a new “interdisciplinary district” located on the current golf course that would foster collaboration by academic colleges and health sciences. The basic premise of this concept was that the new district would emerge as a geographic center of campus and therefore bring vitality to an under populated area.



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1997 LRDP

Planning concepts were proposed for the areas of campus where new projects were anticipated to proceed in the near future, including the College of Engineering Precinct, the Health Sciences Center Precinct, and the Recreation / College of Health Precinct. Major findings and recommendations of this study are outlined below:

- All new capital projects need to support a clear campus diagram of pedestrian links, transit flow, and open spaces.
 - Moderate population growth and academic initiatives will exert slow, steady pressure on land use, facilities and infrastructure.
 - Governance policies and physical locations are needed to support the University's emphasis on interdisciplinary research.
 - Extension of the TRAX light rail system into the campus will fundamentally alter patterns and concentrations of movement.
 - The University needs a review and approval process for capital projects that protects and implements the goals of the LRDP.
 - The University needs to embrace the concept of a sustainable campus out of practical necessity, educational imperative, and as a public policy leader.
 - As the "land bank" for campus growth, the Golf Course property will inevitably be developed, and planning needs to begin now.
- To create a more lively campus core, a logical development of infill buildings adjacent to their respective college buildings is recommended to create a more walkable campus.
 - With the need for Health Science expansion to the west, Wasatch Drive would not be closed as the LRDP shows. Instead, the preferred strategy is to increase its use in order to reduce the dependency and freeway-like traffic along Mario Capecchi Drive.

Fundamental differences in the planning direction presented with the 1997 and 2003 LRDP and the current Plan relate to the location of new construction:

- Rather than a focus on new buildings solely within the "land bank," the Plan proposes a Central Playing Fields zone be established with building development occurring in the northern region in a Interdisciplinary Quad.



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2003 LRDP Supplement *Development implied for the "Land Bank"*

Health Sciences Pedestrian Plan

The University of Utah completed an independent Health Sciences Center Pedestrian Plan in July 2004, which focused on pedestrian safety, mobility, and amenities at the HSC.

The Plan was prepared in response to the issues raised in a HSC pedestrian questionnaire that was circulated during February 2004.

The plan proposed the following:

- Physical development of new pedestrian infrastructure where existing paths were identified as deficient or non-existent.
- Improvements to way finding and signage to allow users to navigate with relative ease through the HSC.
- Establishment of a HSC/Research Park dedicated shuttle to reduce the need for single occupancy vehicle trips.
- Various pedestrian amenities and incentives such as new crosswalks.

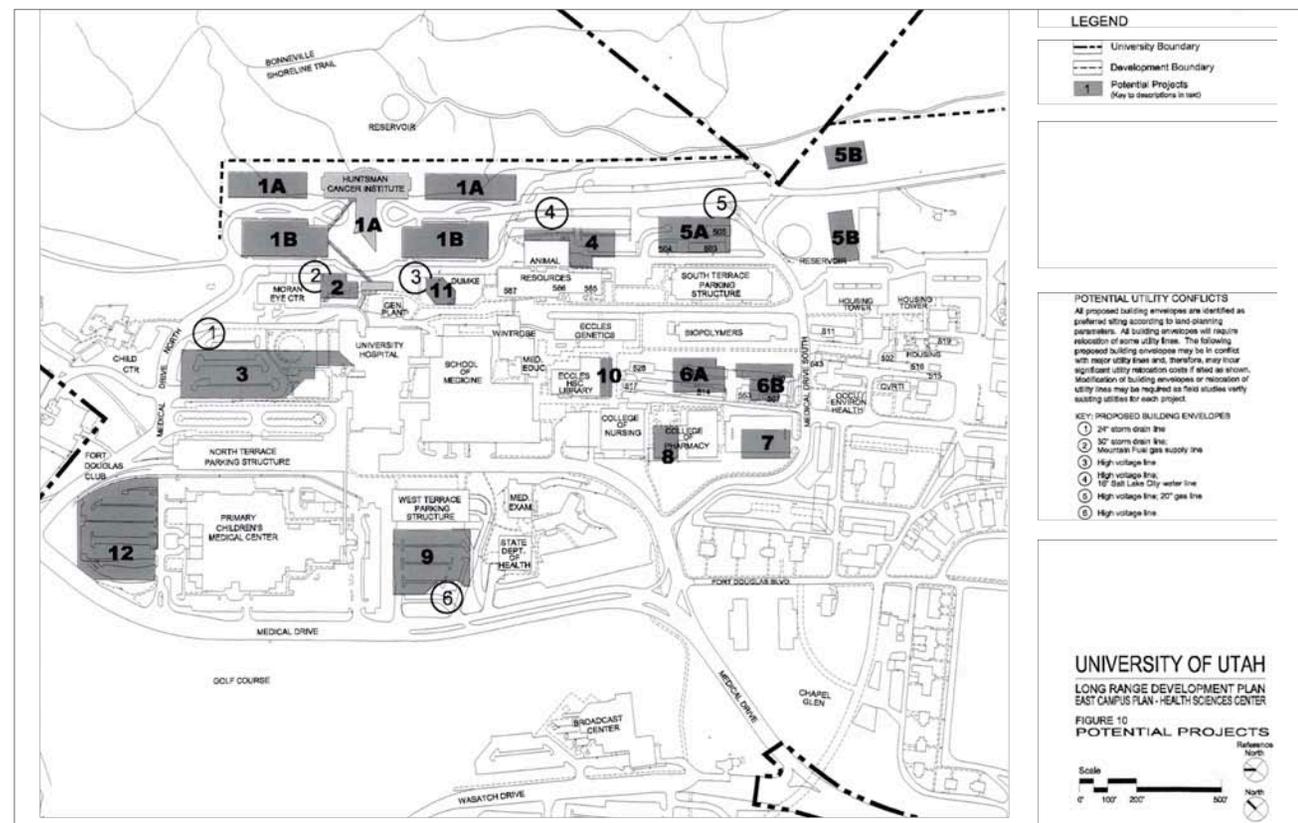
LRDP - East Campus

The East Campus LRDP was prepared in response to projected growth of the Health Sciences Center based on the continuing need for clinics, research facilities, specialty care, and education programs. The Plan provided a number of general plan elements including land use, open space, circulation, and utilities, and outlined a series of specific infill building projects. Many proposals outlined by the LRDP - East Campus have already been implemented or are currently identified as capital development projects, such as:

- Fort Douglas as the site for the Olympic Village as well as for student housing.
- Expansion of the Huntsman Cancer Institute to the north and south along the Wasatch Foothills.
- Expansion of the University Hospital.
- Infill laboratory buildings, including the recently built Emma Eccles Jones Medical Sciences Building.

- Infill education buildings, including the recently completed Emma Eccles Jones Health Science Education Phase I building.
- Primary Children’s Medical Center Hospital Facility Parking north of its existing building.
- New East Campus Central Plant.

Projects envisioned by the LRDP - East Campus that were not realized include the transportation hub and Transitional Care Facility (housing for long-term care patients and/or patient families) at the Moran Eye Center site, and the Dumke Building expansion or replacement. Site 1B south of Huntsman Center Institute has not been developed. HSEB 6A and 6B were built as HSEB which left additional space to the south for an addition which has not been built to date.

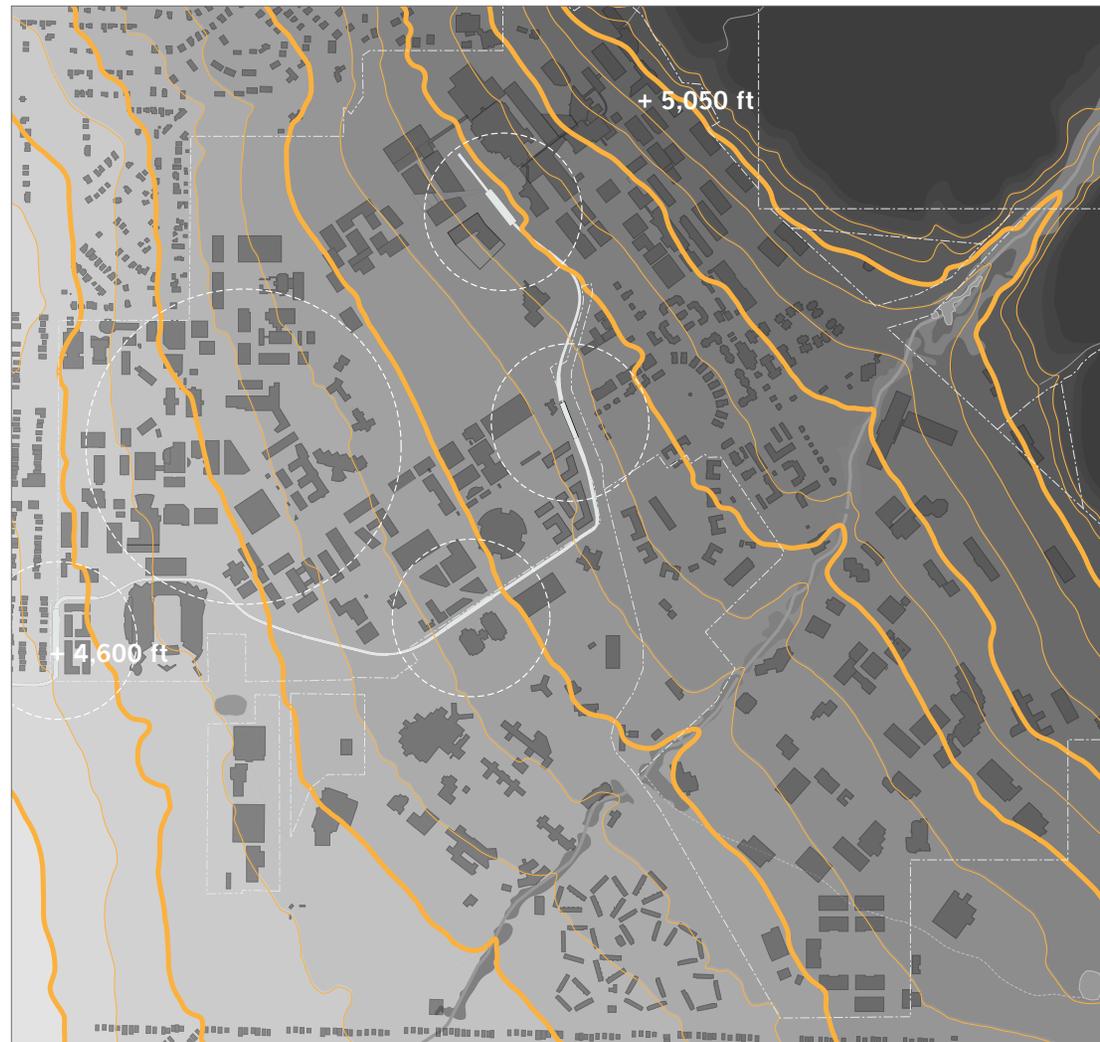


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East Campus LRDP Potential Projects



Wasatch Foothills & Health Sciences Center



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Campus Topography

Campus Development Issues

Topography

Topography is one of the most dramatic natural features of The University of Utah campus. The campus slopes from the northeast towards the southwest reflecting the natural topography of the Wasatch Range foothills. The total average gradient across campus is 6.3%. The difference in elevation from the highest point on campus located approximately 5,050 feet above sea level at the Huntsman Cancer Center, to the lowest point located 4,600 feet above sea level at University Street, is 450 feet.

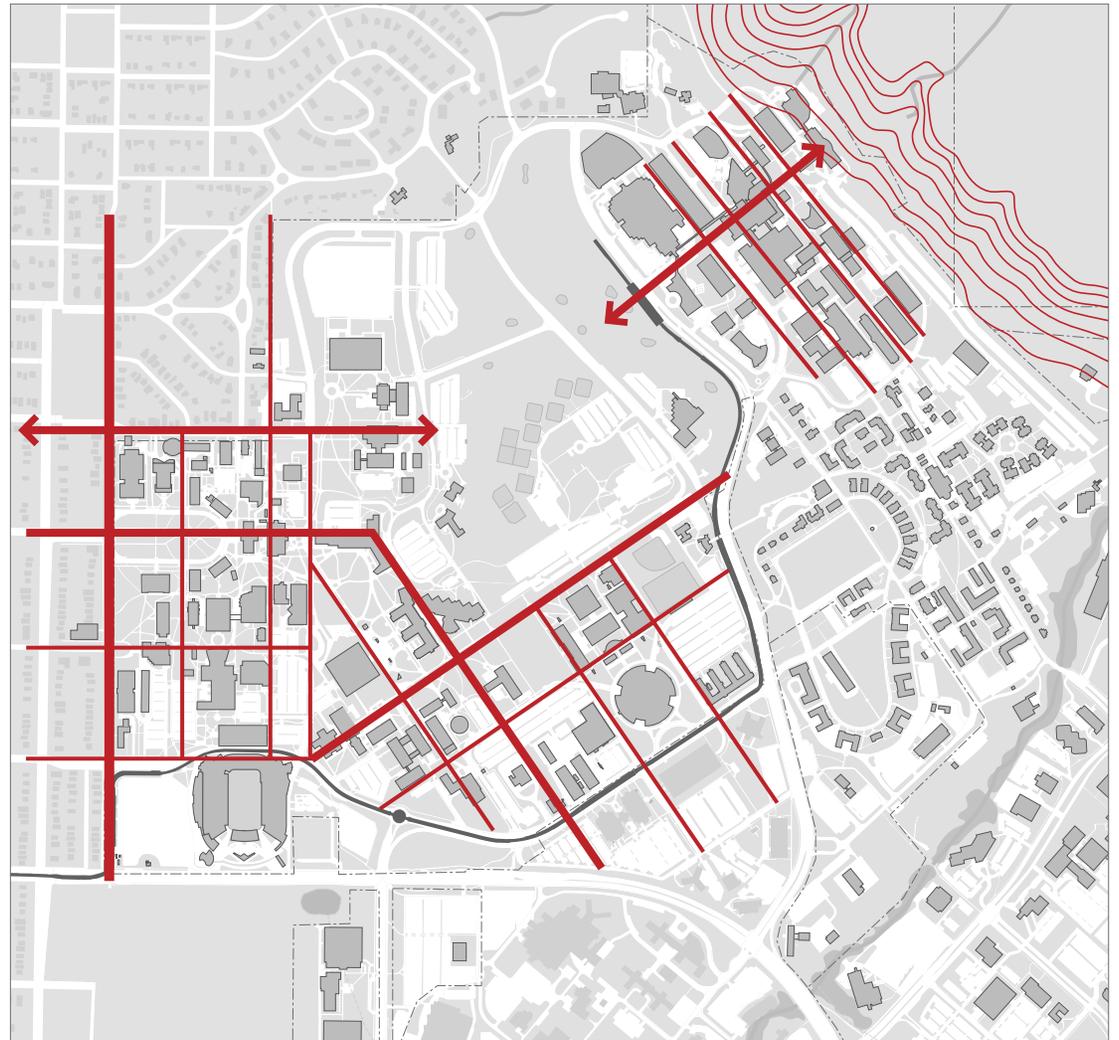
Topography has had an obvious impact on the organization of the campus. The general pattern of campus development is aligned parallel to the slope along a series of “benches.” This is most obvious in the steepest region of campus at the Health Sciences Center. This approach to development successfully minimizes the volume of cut and fill required for new buildings, roads, and other facilities. However, topography presents a major challenge to pedestrian and bicycle movement as well as road maintenance. Speed, effort, route selection, and even the desirability of walking / riding can be affected by significant grade change.

Existing pedestrian and bicycle “desire lines” follow topography. For example, many students who travel to campus in the morning by TRAX prefer the South Campus Station since it is located at a slightly higher elevation to important centers of student activity – the Marriott Library, the Union, and Orson Spencer Hall. As their day progresses they migrate to the western region of campus and often depart using the Stadium TRAX station which is located downhill.

Campus Organization

The campus structure, as it exists today, is primarily organized around two different “grids” of development. The campus grid is generally defined by a system of circulation routes and open spaces. These “grids” closely reflect both the pattern of adjacent city development and the influence of topography.

1. The historic western edge of campus, generally situated between University Street to Central Campus Drive, is organized on an east-west axis. This orientation is based on the adjacent Salt Lake City street grid.
2. Notwithstanding a few curvilinear streets, the majority of the buildings at Fort Douglas were laid out on a grid like system that was aligned with the slope of the terrain and varied from the city’s grid system by about 34 degrees. As the University grew eastward to the mountains, acquiring land and buildings that were previously occupied by the Fort, it adopted the orientation/grid system already in place. The Union Building, which sits at the union of these two systems, was designed to reflect this decision. As the Health Sciences Center developed, its overwhelming density aside, the buildings were set in line with the existing Fort Douglas grid that the Army adjusted slightly in this area based on the terrain.



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Campus Organization

Campus Scale

Campus scale is an ingredient to a successful collegiate environment. It can be argued that the in-between spaces of campus buildings are as important as architectural character or building function. In general, well designed and compact outdoor spaces help to promote a vibrant and safe campus life, which in turn enhances the social and educational interaction that is central to the University's mission.

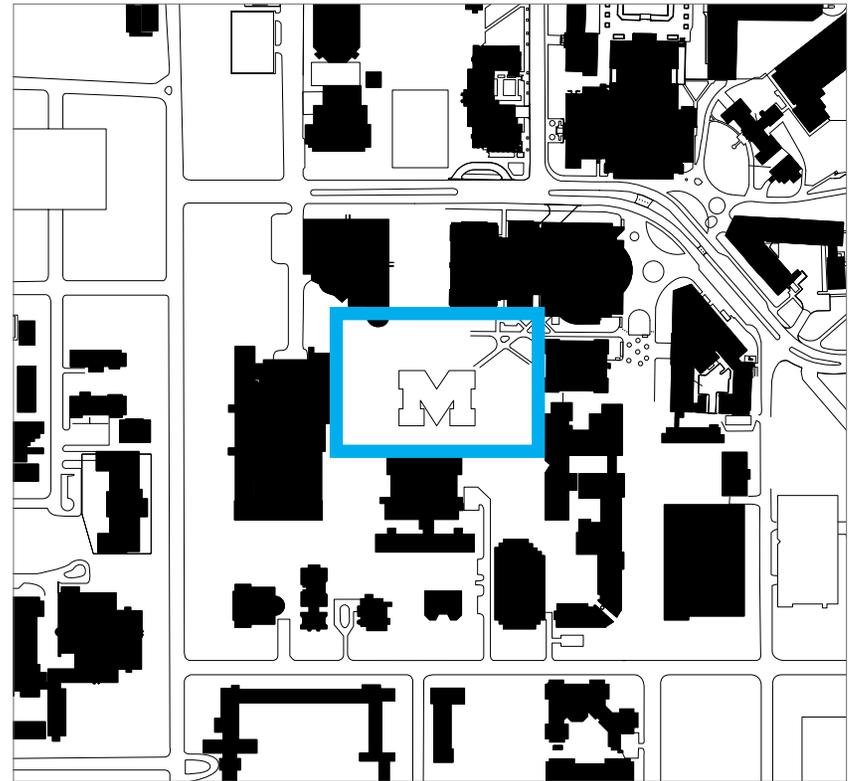
During the planning process various studies were prepared in order to generate a better understanding of the scale of The University of Utah campus. The adjacent diagrams present the scale comparison for the central core area of selected peer institutions, including the Stanford University "Main Quad," University of Michigan "Diag," and the University of California Berkeley "Glade." The scale of these central core areas has been compared to The University of Utah's Union and Marriott Plazas.

The adjacent scale comparison highlights the large scale of University of Utah Union Plaza when compared to other central core campus areas with a similar function.

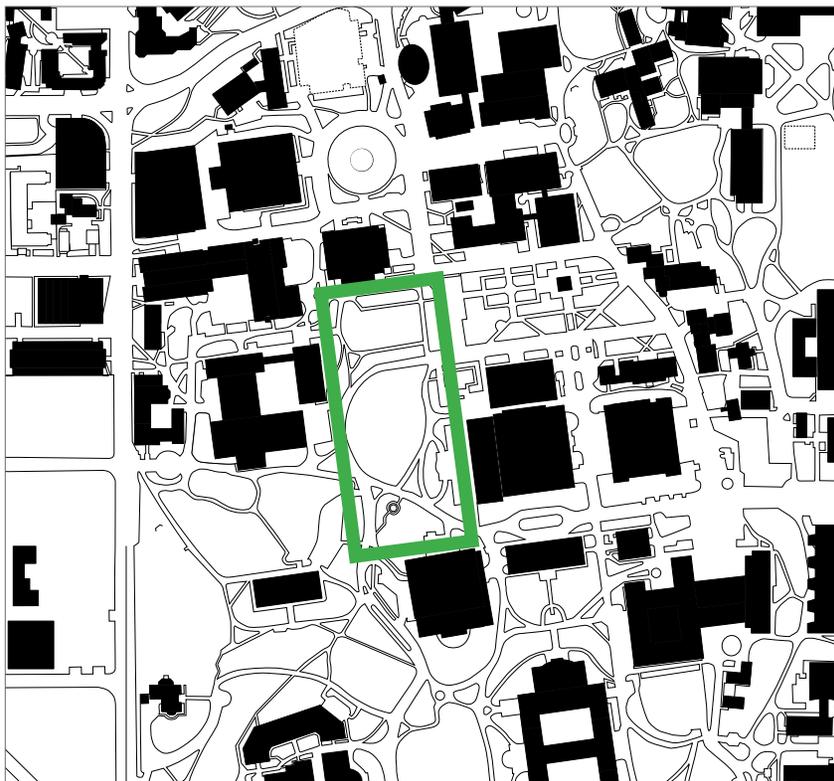




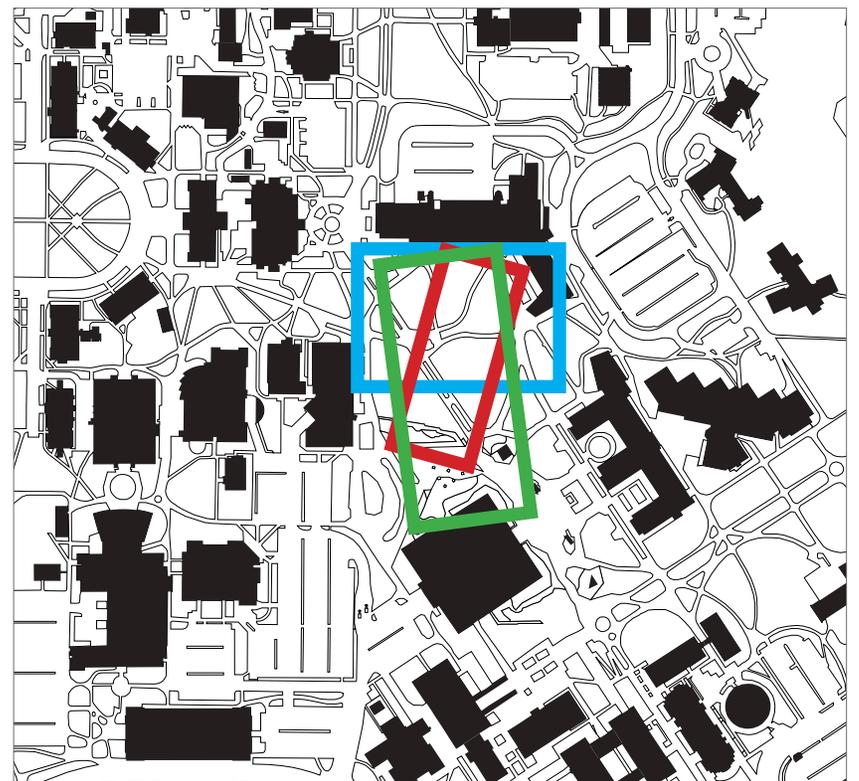
Stanford University Main Quad



University of Michigan "Diag"



University of California, Berkeley "Glade"



University of Utah "Union Plaza"

Moran View Corridor

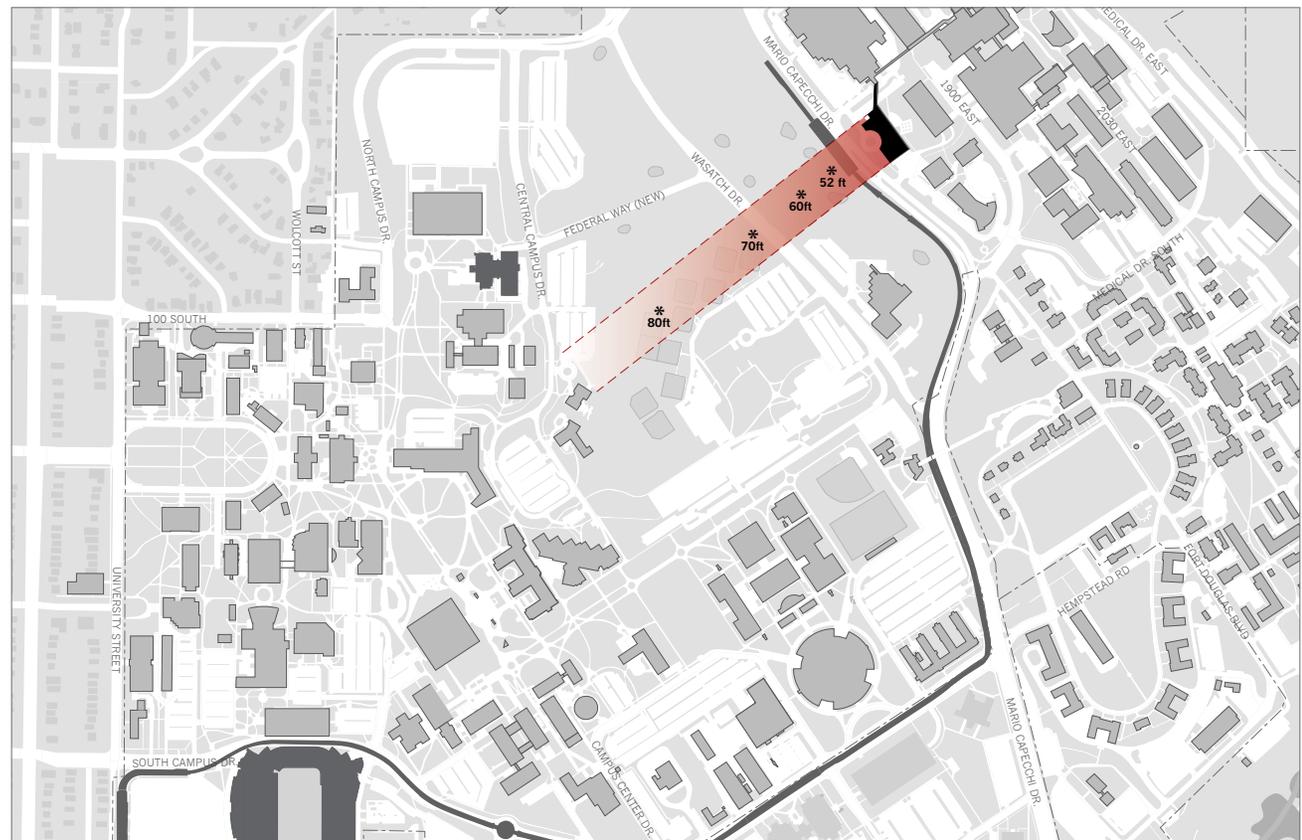
The Moran view corridor was established in 2002 in order to preserve views from the third floor of the Moran Eye Center building towards the Oquirrh Mountains. During the campus planning process, the consulting team reviewed a series of studies to determine the impact of the view corridor on future development located within central campus precinct.

The following excerpt of a letter from President J. Bernard Machen to Mr. John A. Moran, dated May 24, 2002, articulates the specific requirement for this view corridor.

“I propose a 15-year guarantee of unlimited access within the boundaries indicated on the string attached to the photograph. (This is essentially perpendicular lines to the west from the north and south property lines. There is no horizontal limitation in my proposal.)”

The following excerpt of a letter from President J. Bernard Machen to Mr. John A. Moran, dated August 22, 2002, provide further details regarding the view corridor.

“I will commit to a 25-year guarantee to a corridor to the west from the north and south building corners. The horizontal limitation is what can be seen from the third floor of the new building except that there is a also a right-of-first refusal to the building site located on the golf course to the west of the new building. The University promises to attempt to honor your request in perpetuity.”



Moran View Corridor

Eccles Broadcast Center

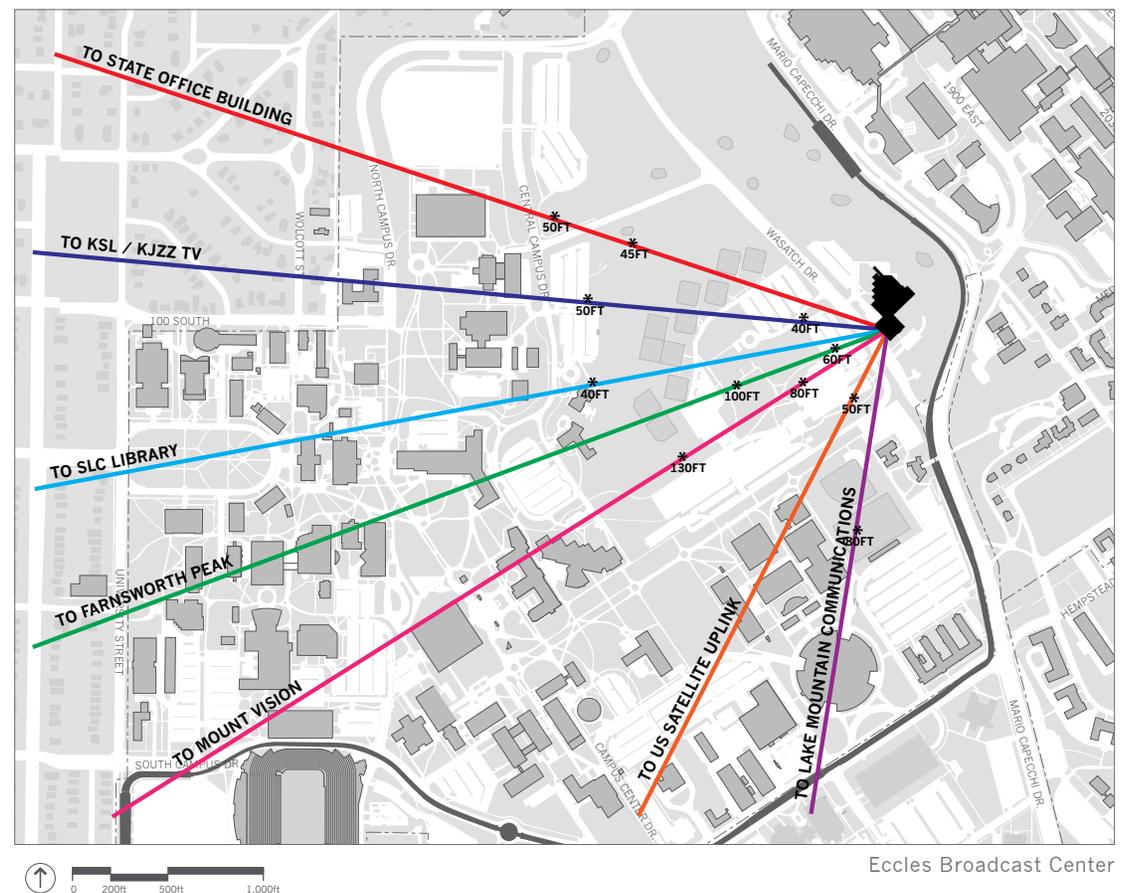
The Eccles Broadcast Center accommodates three broadcast stations and a statewide educational consortium. The center houses KUED, KUER, KUEN and the Utah Education Network. The facility is situated north of the intersection of Wasatch Drive and Mario Capecchi Drive, south of the current University Golf Course.

The facility provides important transmitting antenna and receiving antenna with connections to other broadcast facilities located downtown and across the Salt Lake Valley. These connections operate on a line-of-sight basis, and any obstruction between the transmitting antenna and the receiving antenna will block the signal and interrupt the connection. Based on elevation and alignment of existing transmission connections, the following diagram identifies the maximum height of infill development situated to the west of the Eccles Broadcast Center. The maximum height of infill development is determined by a number of factors, including the location and height of existing transmitting and receiving antennas, and the ground elevation between these antennas.

As part of the stakeholder interview process conducted during the course of the Discovery Phase of the Plan, it was determined by the consultant team that the limitation posed by the Eccles Broadcast Center was primarily significant in its restriction of the development of the central region of campus. The Facilities Planning and Digit Lab, in 2006, conducted an independent study to determine more specifically the height constraint of each transmission and receiving line and examined and quantified relation parameters of any lines that posed unrealistic constraints of the development of the campus as a whole.

In summary, the results of the study revealed only 3 lines may impact development on campus. These are the State Office microwave link, KSL/KJZZ TV Link, and SLC Library link.

The full study is included in the Appendix. As a result of the study, the University is confident that the lines that would need to be moved can be included in future building projects and that the overall impact of the moves can be accomplished with little disruption of service.



Building Assessment

Main Campus

George Thomas Building # 5

William Stewart Building # 6

Life Science Building # 7

Einar Nielsen Fieldhouse Bldg. # 29

Carlson Hall Bldg. # 31

Orson Spencer Hall (OSH) Bldg. # 54

Milton Bennion Hall - Bldg. # 65

S.J. Quinney College of Law Bldg. # 73

Kennecott Building # 372

Fort Douglas Army Reserve

James C. Bungard Hall - Bldg. # 100

Barn - Bldg. # 101

Theron Draper Hall - Bldg. # 102

Franklin McKean Hall - Bldg. # 103

Leopold A. Yost Hall - Bldg. # 104

George W. Latimer Hall - Bldg. # 105

Edward C. Watson Hall - Bldg. # 106

H. Lynn Ostler Hall - Bldg. # 107

Victor L. Olson Hall - Bldg. # 108

Introduction

In the process of the University's on-going capital planning program a select number of buildings on campus are being reviewed for re-use or demolition. The CMP team conducted building assessment walk-through tours of these buildings and examined existing reports to assess their physical condition and offer recommendations to better determine the outcome for this building stock. Among the material reviewed was the "Facility Condition Analysis" conducted by ISES Corporation in 2001, to determine the deficiencies of the University buildings. The ISES study developed projects and relative costs that would be needed over a ten year period to bring the buildings to like-new condition. The study did not, however, examine appropriate program fit, change of use, or recommend program upgrades.

Reaveley Engineering participated in the CMP Building Assessment study and provided their structural expert opinion as to the current condition and long term viability of each of the buildings listed in the column on the left. The University is currently engaged in a Disaster Resistant University study which is examining and ranking each building on campus. The results of this study will be available towards the end of 2008, and a summary of that project intent follows these findings.

University of Utah Buildings

A general description of each building studied and known seismic deficiencies are given. The general descriptions are made from visual observations, previous evaluations, and other limited sources of information at the time of the report. Due to the dates of a number of sources, some of the buildings may have undergone renovations, remodels, or other changes which may not be reflected in the general descriptions. The number shown at the end of each building name represents the building number assigned by the University.

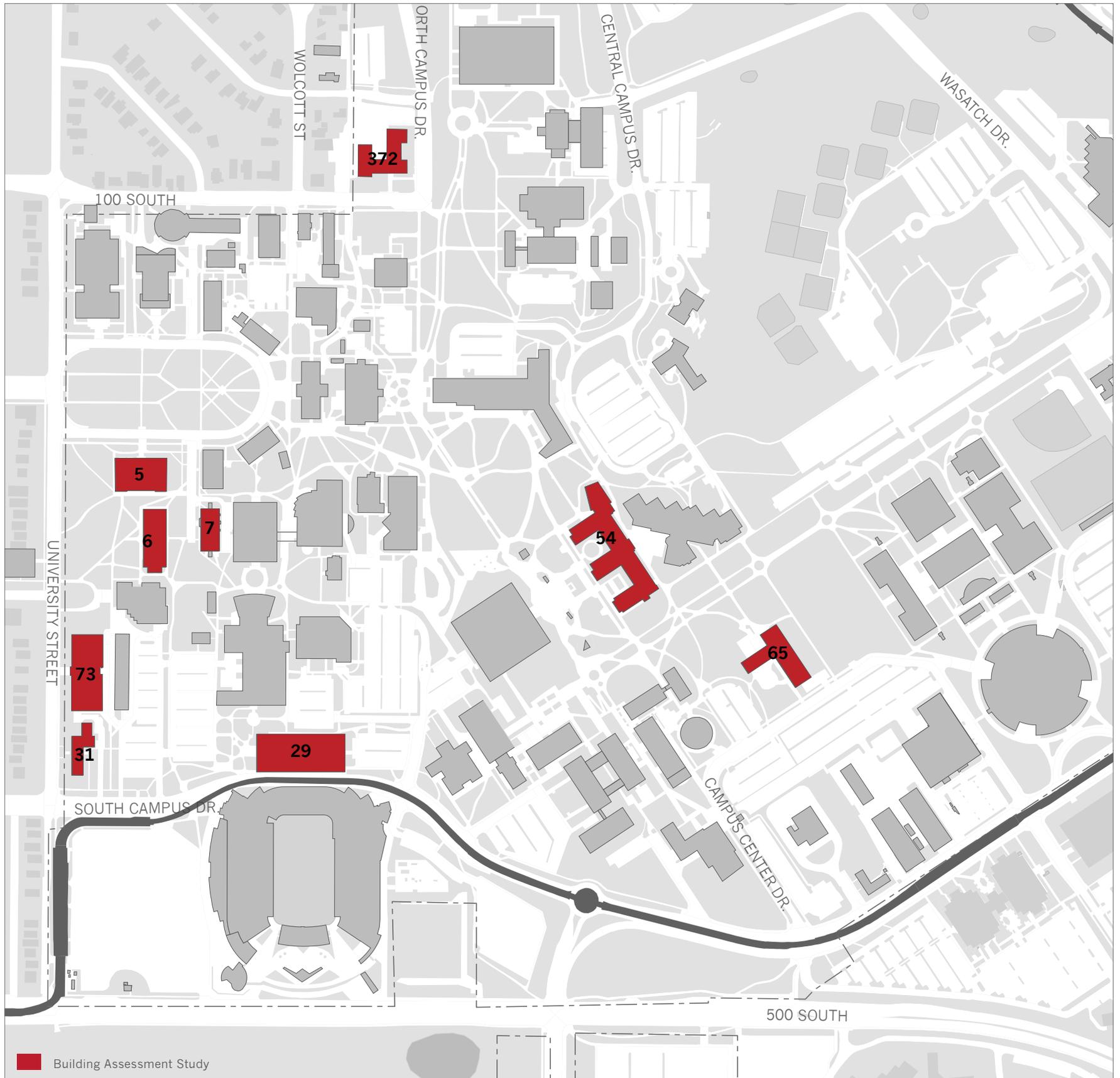
Included in this investigation are results from a Rapid Visual Screening (RVS) Study performed in 1989 by Reaveley Engineers & Associates on the University buildings using the Federal Emergency Management Agency document FEMA 154 & 155. Each building was given a seismic rating of good, fair, poor, or very poor. A final structural score was also given based on a number of structural factors. A building with a score less than 2 is recommended to a detailed evaluation by a design professional experienced in seismic design.

Site Seismic Information

The Latitude and Longitude coordinates for the group of buildings considered in this report is lat: 40.76524° and long:-111.84428°. According to United States Geological Survey (USGS), the peak design ground acceleration is 1.06 g. Site class D has been assumed as the general soil conditions throughout the campus. Please see Appendix A for a detailed report.

Preliminary Seismic Analysis

Based on the linear static procedure from FEMA 356/ASCE 41-06 "Seismic Rehabilitation of Existing Buildings" and the information from Appendix A, the design seismic lateral forces and their distribution over the height of the building were calculated. These calculations are tabulated in Appendix B. From the forces imposed on each building, a calculation was made to reflect the required length of a standard 12" reinforced concrete shearwall in two orthogonal directions. This calculation assumes that there are no other elements that resist lateral loads. It is likely although, that the existing structure will provide some resistance to the imposed lateral loads which would require further analysis of each building.



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Building Assessment - Main Campus

George Thomas - Building # 5

Built: 1935

Size: 86,900 GSF

Utah Museum of Natural History



George Thomas Building - Main Entrance at North Facade

George Thomas Building

The George Thomas Building housed the University’s first free standing Library. The original building construction took place in 1933 and was finished in 1935 with help from the “Works Progress Administration” (WPA). Flanking the southwest edge and providing a sense of completion to the newly defined oval composing the Presidents Circle, its masonry stone exterior wall was typical of the grandeur of the period for prominent institutional and civic construction.

Currently, the George Thomas Building along with its peer buildings on Presidents Circle comprise an historic district on campus that is listed in the National Register of Historic Places. With this degree of stature, four of the buildings in this cadre of historic structures have undergone extensive renovation in meeting the national standard of historic preservation. The degree of historical protection from severe remodeling that each of these buildings has had over the generations has been instrumental in determining their level of restoration and preservation.

The Utah Museum of Natural History (UMNH) has occupied the George Thomas Building since 1968 when the Library moved its collections to the new Marriott Library on the southeast portion of the campus.

Programmatic Reuse Candidates

In the long term the Thomas Building will require significant seismic upgrade and preservation refurbishment. The long term tenants of this building will face considerable costs for this restoration, but the yield in terms of quality of building aesthetic and durability will surely equal the investment. Given its dominant position flanking the historic entry portal of the campus, it occupies a prominent position in relationship to the neighborhood. This is an optimum position for a building that could house civic or public interface programs along the primary “town and gown” edge. The Theatre Department within the College of Fine Arts has been sorely in need of upgraded academic facilities as well as a performance venue that provides seating for a smaller audience than is housed at the Pioneer Theatre. Theatre seeks a “black box” performance space.

In the short term, prior to funding being available for the appropriate seismic and renovation upgrades, the George Thomas Building could provide “swing” or “surge” space for other building programs that need temporary homes while their current homes are being renovated or rebuilt. Possible candidates for this temporary reuse are the Park Building which is under current renovation and/or The College of Law which has begun a study to determine the long term options for its right-sizing and future growth whether as a renovation to its existing building or the construction of a replacement facility in its current location. The new UMNH building is anticipated to open in 2009 or 2010. This timing may not coincide with neighboring project surge space needs for the effective temporary use of George Thomas. Depending upon the success of the fund raising campaign underway for the College of Fine Arts and its priorities, the Theatre Department may begin their reuse efforts on the heels of the UMNH relocation.

Mechanical Systems

The George Thomas Building’s original steam pipe heating system was converted to a high temp water heating system in 1974. This current 30 year old system will require replacement during the renovation/upgrade.

- District Steam Heat: four inch high pressure steam line from the Chemistry Building
- Primary cooling system: reciprocating chilled water system located in Basement Mechanical Room
- Supplementary cooling system: window mounted air conditioners and several DX split systems.
- Constant volume air distribution system, original to the building (70 years), inefficient and maintenance intensive

Structural

Building Description: The original structure was built in 1933. This building received a non-structural remodel in 1978. The approximate total square footage of the building is 86,900. The building has 3 floors. In addition to the 3 floors, there is a basement.

The foundation is a system of reinforced concrete continuous and spot footings. The roof framing is made up of steel trusses clear spanning the exhibition space with a concrete roof diaphragm. The roof and floors are supported by a concrete frame with un-reinforced masonry wall which provides the lateral force resisting system. This structure was originally constructed as the main library for the university and served this purpose until being replaced by the Marriott Library in 1968. The 200 ft by 50 ft open exhibition space in the front of the building is approximately 40 ft to 50 ft high. This space creates very high seismic shear forces in the roof diaphragm and also a significant potential for the exterior walls to buckle outward during an earthquake. The suspended floors were designed to support library stack loads and therefore have adequate live load capacity for most building uses.

RVS Information: This building received a final structural score of -0.3 and given a seismic rating of very poor.

Seismic Deficiencies: The 1978 remodel did not include seismic upgrade provisions. Due to the un-reinforced masonry and terra cotta exterior, the building is considered very heavy. The roof diaphragm over the large exhibition area is inadequate to transfer the seismic shear forces. The un-reinforced masonry walls do not have adequate capacity to transfer the seismic forces to the foundations. The tall exterior masonry walls at the front of the building most probably do not meet minimum height to thickness ratios and will require strengthening or bracing.

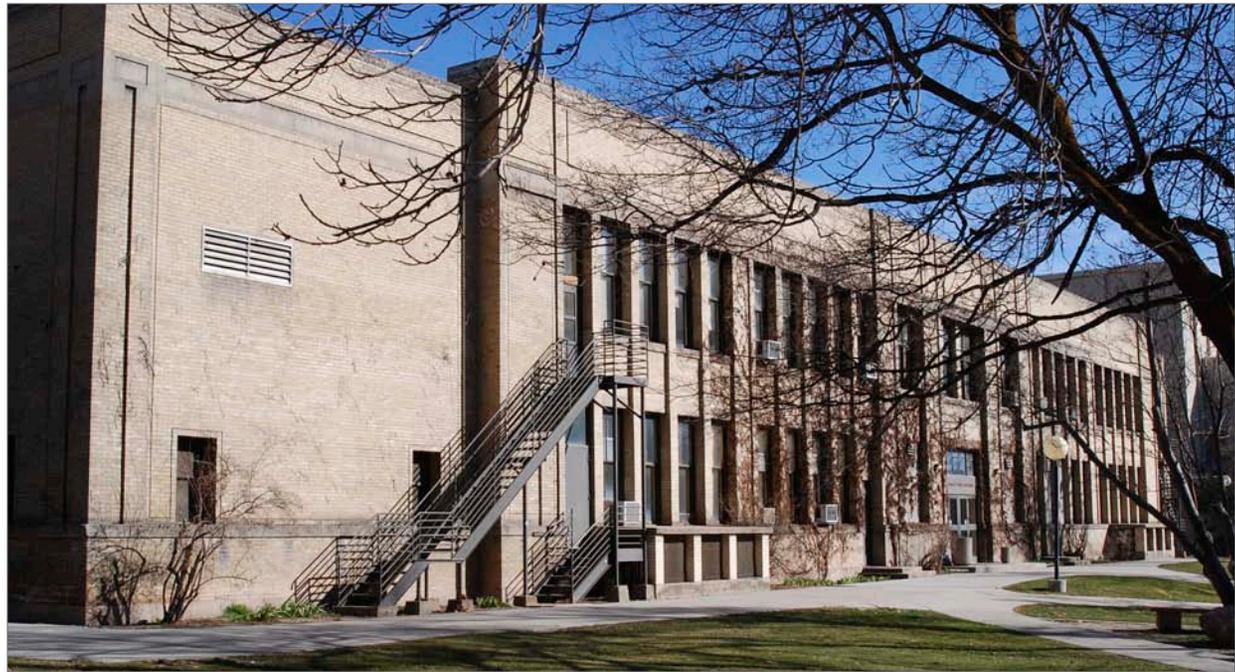
William Stewart - Building # 6

Built: 1919

Size: 35,474 GSF

College of Science

Department of Anthropology



George Thomas Building - Main Entrance at North Facade

William Stewart

Built in 1919 as a grade school classroom building to support the educational mission of the University, the William Stewart building has touched many in the Salt Lake City community.

It is currently home to the Department of Anthropology within the College of Social and Behavioral Science. Despite limited space, it continues to serve their academic needs. The lack of adequate space for research projects requires ingenuity and determination. For example, the CMP team observed the use of a plastic drape that quartered off a portion of the lab space in an attempt to create an ad-hoc clean room environment. This two story classroom building has offices and classrooms on both the first and second floors. As can be seen from the floor plans the building has a rectangular layout with a central entry from both the east and the west. The west side of the building has a double tiered grand stair that flows into a central stair as it reaches the second level. Obvious interior renovation of the second floor landing can be seen as the two outer stair runs on either side of the central run, are

truncated and narrowed down at the upper landing where they enter the second floor hallway. This appears to have been done in order to provide a fire separation wall and doors between the upper and lower hallways connected by this stairwell and may have occurred at the time the exterior fire-stairs were added.

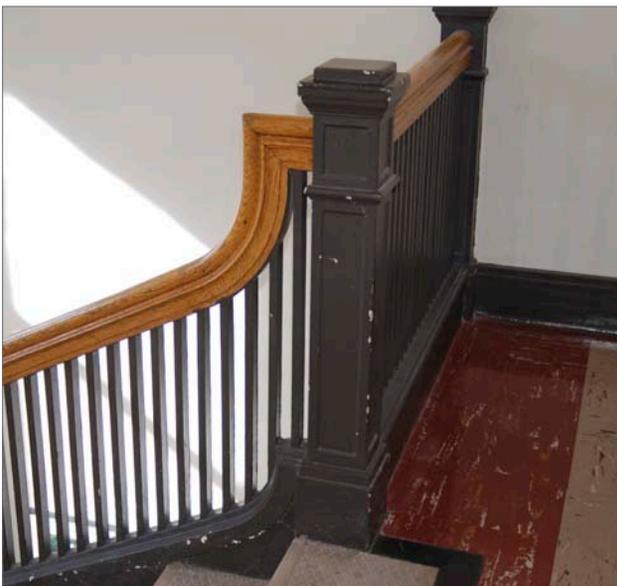
The exterior brick of the building is deteriorating and will require re-pointing and a thorough cleaning. The ivy on portions of the building should be removed to lessen the mortar decay. The exterior wood windows are weathered and the sills are in poor condition and should be either restored if a preservation remodel is chosen or replaced if a modern tact is taken for this renovation. The interior of the building for the most part is “tired” and needs at a minimum a repainting. A number of the classrooms still show signs of a leaking roof with stained and crumbling ceiling tiles. The original flooring which is in poor condition, appears to be an asbestos vinyl floor tile which will required appropriate encapsulation or removal.

Building Infrastructure

The HVAC systems in this building include steam, cast-iron radiators, fin-tube units, window air conditioners, rooftop units, a central station split system unit, and ductless split system units. Overall these systems are in poor condition and inadequate to appropriately serve the occupants. A complete replacement system is recommended in order to meet current heating and ventilating codes as well as to provide a satisfactory level of comfort for its occupants. New lighting and electrical distribution system is needed throughout. The electrical system received upgrade with a new switchgear and panel-boards throughout around 2001. The water piping and plumbing fixtures in this building are deteriorated and require replacement. As well the building does not meet current ADA code and will require adherence to Accessibility requirements should this building be renovated and seismically upgraded for continued use.

Re-use Options

Because the building was designed as a grade school, the high ceiling height in the central corridor on the top



Second floor stair - truncated landing

level suggests that an additional level of usable space could be added if this building underwent renovation and seismic upgrade. With its prominent location along University Street and Cottam's Grove as its front yard, careful consideration for its re-use could be made. It begs the question whether the College of Law would be better suited to this site as a new location for a professional school along the edge of campus. This would require relocation of Anthropology and the demolition of the Stewart Building. With the College of Science as well as the Performing Arts as its neighbors, the Department of Anthropology is already separated from the rest of its College which is primarily located further east towards the center of campus. There are no current plans or funding for Anthropology to relocate. In conclusion, because the William Stewart Building resides in the historic region of the West Precinct of campus it should be given ample consideration for re-use. Removing buildings from this time period is a sensitive matter. Sentimentality and cultural preservation are important factors to influence the decision to restore a building of this vintage. A creative re-use study should be conducted on this building. Given that the front door of the building appears to face the Life Sciences Building and not to respond in a prominent manner to its address on University Street suggests that an addition could be added to this building serving a number of purposes, including new interior exiting stairs, a third story tied into an infill third level in the existing building and an appropriate new face addressing University Street.

Commemorative Plate

In memory of the William M. Stewart Training School which functioned in this building from 1919 to 1966. Founded and nurtured under the enthusiastic leadership of William M. Stewart, a protégé of Colonel Francis W. Parker and John Dewey.

Professor Stewart counseled
 "SCHOOL SHOULD BE A LIFE
 LABORATORY IN WHICH YOU
 PROCEED FROM THE CONCRETE
 TO THE ABSTRACT."

The school served a dual purpose in training teachers as well as students to "Learn by Doing." Stewart School Alumni University of Utah 1988



Second floor hall - double height space

Structural

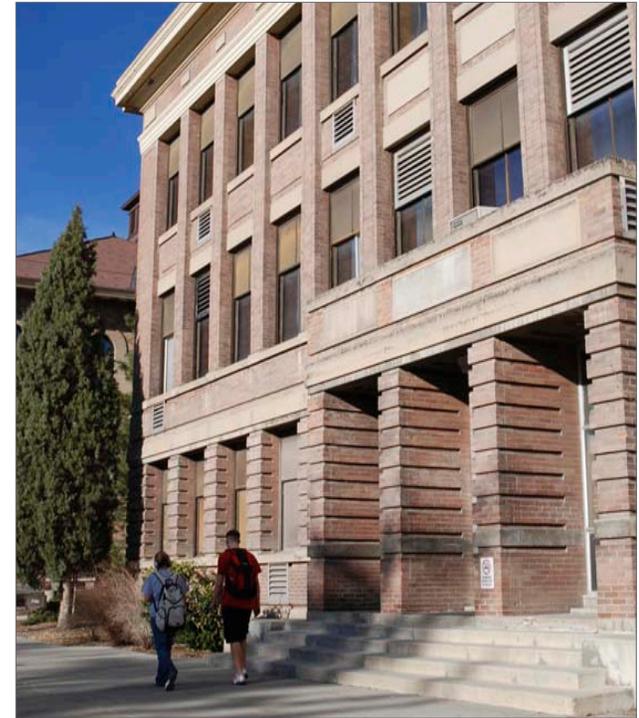
Building Description: The original structure was built in 1918-19 as an elementary school. This building received a non-structural remodel in 1970. The approximate total square footage of the building is 35,474. The building has 2 floors plus a penthouse. The floors are a system of concrete slab and concrete joists supported by a concrete beam and column frame. The walls are unreinforced masonry infill. The lateral force resisting system is a concrete frame with un-reinforced masonry infill. The gravity system appears to be performing adequately.

RVS Information: This building received a final structural score of 0.7 and given a seismic rating of poor.

Seismic Deficiencies: The exterior frame/walls contain many window openings which create a severe torsional irregularity and afford little resistance to earthquake forces. The structure also contains two-story high interior open spaces that function as the main hallway. This space creates a serious discontinuity in the horizontal diaphragm which could lead to premature failure during an earthquake. The penthouse portion creates a significant vertical irregularity.

Conclusions

Overall the Stewart Building will require an extensive remodel to address the infrastructure deficiencies, code requirements and seismic upgrade necessary to bring this building into compliance and to give it another 50 years of optimal use. It could be coupled with an addition to the west which would help to strength the building and to expand the amount of usable space. The site is prominent and the building, if not given appropriate attention in the next decade could be considered for demolition and replacement. This later strategy would likely be met with local opposition and on behalf of preserving the University's historic legacy should be the last resort.



Life Sciences Building - West Entrance

Life Sciences

The Life Sciences Building was the First Medical School building on campus. It was built in the first decade that the University of Utah occupied its new campus. Typical of other science buildings of its time, it is organized with a central double loaded corridor with class labs on level one and offices and smaller research labs on the upper three floors. Every square foot of usable space has been carved out of this building with odd shaped lab bench space and lab support wedged into the gabled attic space. As a result, a raised floor to accommodate infrastructure creates odd stepped spaces which are exemplary of conforming modern scientific spaces to outdated lab buildings of this vintage.

Of more concern in this building than the lack of ADA compliance is the substandard ventilation provision. The exterior brick is in a poorly weathered condition and the mortar is deteriorated. Limestone window lintels are cracked consistently on the eastern side, which may be a result of uneven settling of the building over time. The foundation appears to have been



Life Sciences Building - West Facade

Life Sciences - Building # 7

Built: 1920

Size: 36,868 GSF

College of Science

Department of Biology

upgraded with concrete additions to the basement columns and spread footings. The major steam line runs through the eastern edge of the building at this basement level.

Structural

Building Description: The original construction was started in 1915. The building dimensions in plan are roughly 161' by 65' and the building functions as research laboratory space. Additions to the building were made in 1939, and in 1969, concrete stairwells to the north and south were added. This building received non-structural remodels in 1975, 76, 78, 81, 91, and 92. The approximate total square footage of the building is 36,868. The building has 4 floors. In addition to the 4 floors, there is a basement in the 1939 addition section. The roof is composed of wood joists and sheathing. The floors are a system of concrete slab and concrete joists supported by a concrete beam and column frame. The walls are unreinforced masonry infill. The lateral force resisting system is a concrete frame with unreinforced masonry infill. The new stairwells may provide some lateral stability.

RVS Information: This building received a final structural score of 1.2 and given a seismic rating of poor.

Seismic Deficiencies: The chimney and cornices are considered to be a falling hazard. The lateral stability offered by the stairwells may not be adequate to prevent major structural damage. The un-reinforced masonry walls are not adequate to transfer the lateral seismic forces to the foundations.

Conclusions

Preserving The University of Utah's historic west campus would require a commitment. This area of the main campus has a distinctly collegial campus feel, where buildings face each other and have their entrances in alignment. The CMP team recommendation for Life Science building however, is demolition, due to its prime location for science expansion space. On other campuses which strive to preserve and restore all antiquity buildings this building would be slated for seismic renovation and a historic preservation rehabilitation project. Its re-use at The University of Utah could be for faculty offices and small faculty labs; however, it would come at great expense.

Einer Nielsen Fieldhouse Bldg. # 29

Built: 1939

Size: 72,250 GSF

Recreation Facility



Einar Neilson Fieldhouse

The Einar Neilson Fieldhouse was built in 1939 to expand the indoor athletic facilities on campus. At the time the existing gym built in 1906 could no longer accommodate the expanding athletic programs. Today the Einar Neilson Fieldhouse is widely used by students, faculty and staff as the primary recreation facility on campus. The athletics program on campus moved into the Huntsman Arena, the shared Athletic and College of Health facilities on HPER Mall and other facilities along Guardsman Way. The Fieldhouse has four levels following a remodeling in 1976, which created upper level racquetball courts and a dance studio. It also reworked the lower floor offices and locker rooms. The main area of this building is on the second floor, which is at grade on the eastern side of the building. This second floor contains indoor tennis courts for the university faculty, staff and students. This same portion of the building also has an elevated indoor running track. The field house has a rectangular footprint with roof gables on each of the four corners of the building. This building totals 72,250 gross square feet.

The new Student Life Center currently in the planning stages for the central portion of campus will consolidate the recreation programs across the University into one facility. At that time the Einar Neilson Fieldhouse will become available for re-use. For continued long-term re-use of this facility a seismic retrofit should be implemented.

The 1970s HVAC system is past its useful life and provides inadequate ventilation in many portions of the building. The large open fieldhouse volume is problematic in the warmer months and the occupants have resorted to large floor fans placed at exit doors left open at both sides of the building to create cross ventilation and some relief from the heat. The interior is dated and worn, and would benefit from a remodel upgrade. The exterior brick requires cleaning, repair and repointing. The windows are single pane lattices which should be replaced with structurally sound construction that is suitable for their height in regards to seismic safety, yet similar in lattice proportion in

keeping with the historic appearance of the building. Although the building begins to meet ADA accessibility needs, many areas are still lacking in compliance. Head clearance hazards, door hardware, power-assist for primary entrances, and a solution to meet plumbing fixtures requirements all need to be brought into ADA compliance.

Re-use Options

Although a number of programs have examined the Fieldhouse for possible re-use, the most natural candidate would be the Department of Athletics. Having given up this building in the past with their move to the southern portion of campus, the Athletics Department has requested a new opportunity to re-use this building for their expanding women's programs especially. Women's Volleyball courts with spectator seating would be ideal for them. Returning spectator sports to this building will warrant increased occupancy evaluation. It is the recommendation of the CMP team that the long term use of the Einar Neilson Fieldhouse be thoughtfully approached and that the building receive the restoration and seismic upgrade that is needed rather than considering the facility for immediate re-use after the Student Life Center is built and the Fieldhouse is vacated.

Structural

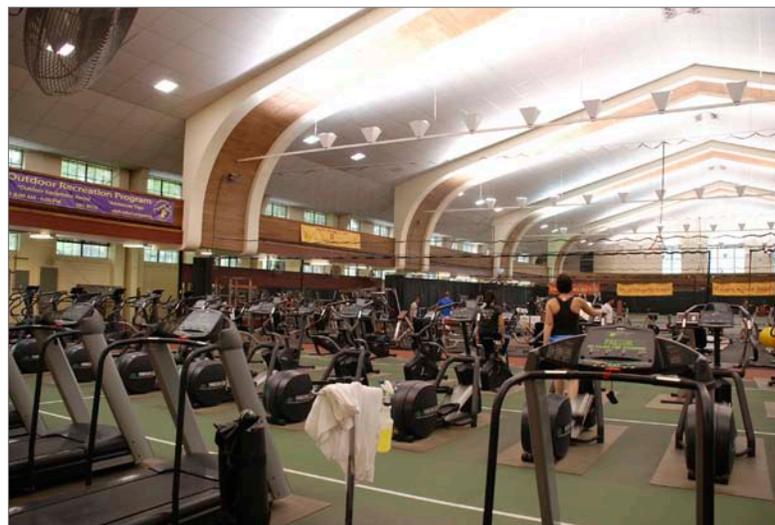
Building Description: The original structure built in 1939 received a remodel upgrade in 1976 that did not address seismic upgrade of unreinforced masonry walls. The approximate total square footage of the building is 72,250. The building is one story with several mezzanines. There is a partial basement.

The foundation is a system of reinforced concrete continuous and spot footings. The roof is composed of steel trusses-arches supporting wide flange purlins.

The roof steel trussed-arches are spaced at 20 to 25 ft on center and provide support for gravity loads, as well as support for lateral wind and seismic forces in the north-south (crosswise) direction. Tension-only steel rod bracing between the exterior trussed-arches provide lateral support in the east-west (lengthwise) direction. A suspended running track supported by the trussed-arches on the outside and steel wideflange columns on the inside edge, circumscribes the facility. The exterior walls are un-reinforced masonry.

RVS Information: This building received a final structural score of 0.2 and given a seismic rating of very poor.

Seismic Deficiencies: The steel trussed-arches require additional analysis to verify their ability to support the required roof gravity loads (snow) and also to verify the lateral wind and seismic load capacity. The steel rod bracing in the east-west direction was probably used for temporary erection stability until the un-reinforced masonry infill walls were installed. The exterior walls have many large window openings providing natural daylight to the gymnasium and will not provide adequate resistance to lateral wind and seismic forces in either direction.



Interior of gym with existing recreational use

Carlson Hall - Building # 31

Built: 1938

Size: 33,689 GSF

College of Humanities



Carlson Hall - Main Entrance on University Street

Carlson Hall

Carlson Hall was built in 1938 as a women’s residence hall. It is a three story building which originally had single and double occupancy rooms along narrow unrat-ed corridors. Carlson Hall is currently used as office space to house various programs from the College of Humanities, the College of Social & Behavioral Sciences and the College of Law. The building’s interior is in fair condition with paint remodeling at on-going “as needed” intervals. The original wood and stone wain-scot detailing remain intact. The building infrastructure systems are worn and provide imbalanced air control throughout. Steam radiators provide heating and indi-vidual room air conditioners provide inefficient and costly cooling. The ADA access to this building is sub-standard with east entrance wheelchair bound visitors requiring assistance to negotiate the only grade level door entrance. Once inside this service access door there is a tight vestibule-hallway to access the eleva-tor which is original to the building and has a manu-ally difficult elevator door for access to all the floors, given that even the first floor is above the ground level entrance. The sitting room and dining room have his-toric coffered ceilings and fine furnishings.

Re-use/Demolition

The fate of Carlson Hall is quite a dilemma. As many of the un-reinforced masonry buildings on campus, it too would require seismic upgrade in order to provide adequate long-term earthquake preparedness. This will come at a substantial cost compared to the value of the building. It has historic value given its age, but will take considerable amount of remodel to provide ADA accessibility and code compliance. The College of Law in its adjacency is considering the possible reuse for fac-ulty offices. Overall the site that Carlson Hall occupies at the corner of University Street and South Campus Drive would warrant a more substantial campus build-ing. Re-building the College of Law in this location would be an appropriate candidate.

Another possible re-use for this building would be as a visiting scholar or performing artist residence. The College of Fine Arts currently rents space in local hotels to house their visiting performing arts faculty and staff which come to the University for several months at a time for seasonal stage productions and teaching engagements. The proximity to the performing arts



Carlson Hall · Rear Entrance at East Facade

venues on campus would be ideal. To re-use Carlson for this purpose would require toilet/bathroom upgrades and additions considering the previous residential accommodations were dormitory style with congregate toilet/showering facilities by floor. This amount of renovation would likely trigger an ADA upgrade and fire-life safety code compliance including a fire sprinkler system.

Structural

Building Description: The structure was built in 1939. In 1974, this building received a non-structural remodel. The approximate total square footage of the building is 33,689. The building has 3 floors at an average 11 ft height with the top story being approximately 8 ft – 4 in. The building height is 31 ft to the top of walls and 41 ft – 10 in to the top of the roof structure. In addition to the 3 floors, there is a basement and a small penthouse.

The foundation is a system of reinforced concrete continuous and spot footings. The floors are constructed of a system of concrete slab and one and two way concrete pan joists. The roof is composed of concrete one way pan joists bearing on steel trusses and concrete beams. Interior columns are made up of reinforced concrete. Exterior columns are concrete wall pilasters. Walls are constructed of unreinforced masonry. The lateral force resisting system consists of unreinforced masonry walls.

RVS Information: This building received a final structural score of -0.8 and given a seismic rating of very poor.

Seismic Deficiencies: The building configuration includes an irregular plan layout with vertical discontinuities. The un-reinforced masonry walls have inadequate capacity to resist the required lateral seismic forces. The horizontal diaphragms are not connected to the shear walls adequately to transfer the seismic shear forces.

Orson Spencer Hall - Building # 54

Built: 1955

Size: 116,148 GSF

College of Social and Behavioral
Sciences & General Classroom Building



Orson Spencer Hall

Orson Spencer Hall can fondly be described as the “work horse” classroom building on campus. It has served as the concentration of undergraduate classroom space on the main campus and in its 50 years of existence has had minimal upgrades due in part to its constant use.

In the initial investigation and interview process related to this building, its upgrade and renovation needs were thought to be possible, accomplished in phases one wing at a time. The ISIS review did not provide a structural review. The recommendations from Reaveley Engineering as stated in the structural seismic section that follows identifies the need for a moment frame reinforcement. This type of structural renovation will require that the building be vacated as the interim stages of upgrade to the moment connections will cause unequal loading to the overall structural continuity of the building.

The renovation of Orson Spencer hall will require a thorough gut-remodel as all areas of the building are in poor condition. The structural upgrade required trumps all hopes of occupying the building during renovation. With this situation and with ¼ of the classroom space on campus residing in this building, the University will need to seek alternate space to accommodate OSH’s rehabilitation or replacement. Some universities have successfully utilized portables to meet a temporary need. The solution at the University, may be to re-evaluate closely, the course schedule and to implement an increase in PM courses offered to redistribute classes currently held in OSH. All options are being considered by the University and are beyond the scope of this evaluation.

The University plans to seek funding from the State to build a new classroom building. Unfortunately for the undergraduates, the classrooms in Orson Spencer hall do not meet 21st century technological needs.

Structural

Building Description: The original structure was built in 1955. The approximate total square footage of the building is 116,148. The building has 2 floors on the west sections and 3 floors at some locations of the east sections for at an average 11 ft height for a total height of 25 ft to 36 ft. There is a crawl space and some tunnel areas.

The completed building is made up of 3 inter-connected phases. They will be referred to as North, Center, and South buildings. The North building has a large auditorium area attached to an L shape classrooms building. The foundation is a system of reinforced concrete continuous and spot footings. The roof of the auditorium is made of steel trusses supporting open web steel joists. The classroom portion is also open web steel joists with metal decking. Floors are made up of a 4 inch concrete slab supported by open web steel joists bearing on wide flange steel girders. Steel wide flange, and standard pipe columns as well as masonry and concrete bearing walls are used in this building for gravity support. Lateral wind and seismic forces are resisted by un-reinforced masonry walls that infill the steel frame.

The Center building, added in 1958, uses a 1-1/2" type B metal roof deck. The floor is 3" concrete over standard corrugated metal deck. Other framing elements are similar to the North building.

The South building, added in 1970, was built and designed by methods similar to the North building.

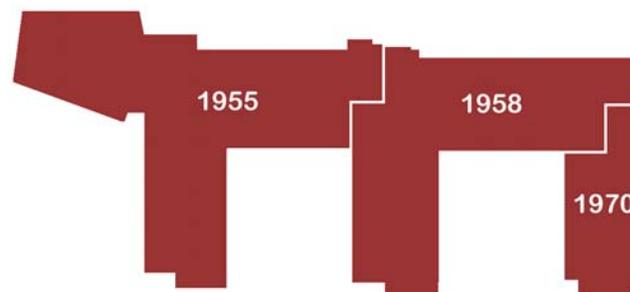
The lateral force resisting system is a combination of a few moment connected steel frames and concrete bearing/shear walls. Floors are considered to be rigid diaphragms.

RVS Information: This building received a final structural score of 1.2 and given a seismic rating of poor.

Seismic Deficiencies: Seismic deficiencies include inadequate connection of the floor and roof diaphragms to the shear walls and inadequate shear wall capacity. The plan configuration of the building with individual wings connected to a main linear trunk of the building form a highly irregular plan which would be more problematic in a seismic event.

Conclusions: Renovate/Demolish

Renovation of OSH will be too costly and will require vacating the building to do the work. The CMP recommends that Orson Spencer Hall should be replaced. Replacement classrooms will need to be built prior to its demolition. The preliminary findings of the current "Disaster Resistant University" study being conducted also support this conclusion.



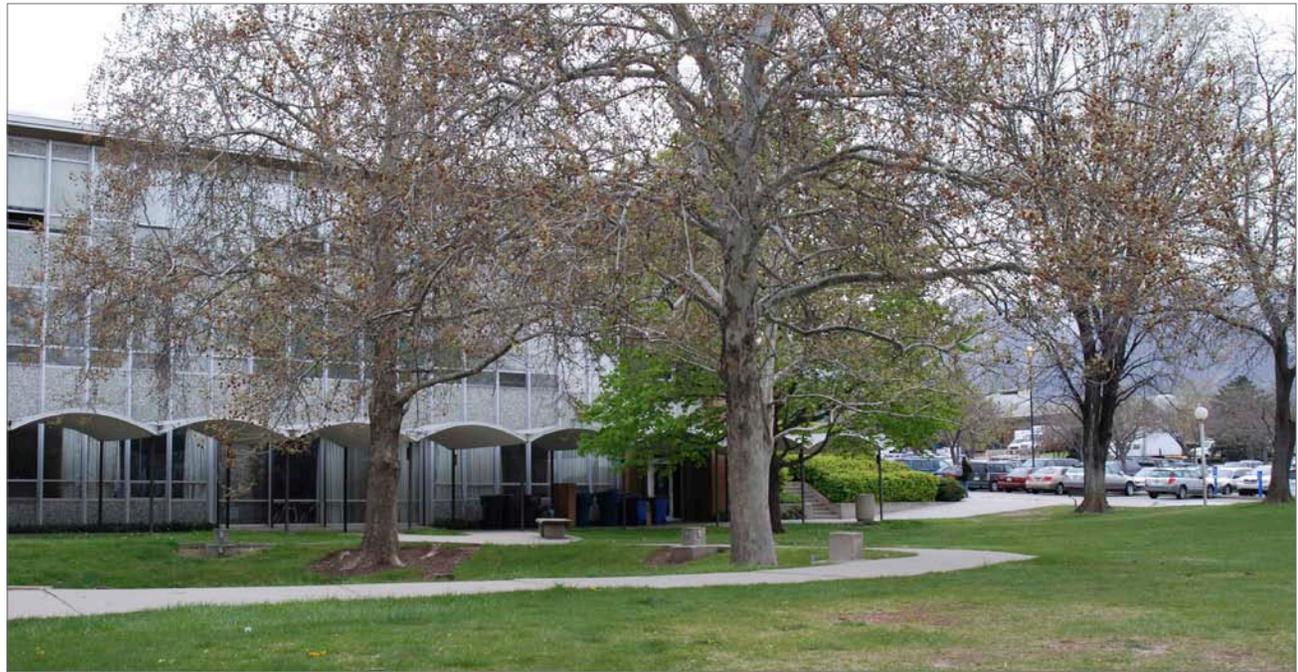
Orson Spencer Hall Inter-connected Phases

Milton Bennion Hall - Building # 65

Built: 1959

Size: 78,158 GSF

College of Education, General
Classrooms & Instructional Media
Services



Milton Bennion Hall

Milton Bennion Hall was built in 1959 as a three story building housing the College of Education. It appears that the building's interior has been reshaped over time to maximize the usable program space. These remodels of the building, to gain more office space, have resulted in code minimum corridor mazes which lack aesthetic appeal. Other areas of the building have been sequestered to provide overflow relief resulting in lounge furniture and chairs for waiting occupying many of the hallways and open stairwell areas which compromise circulation movement in the public corridors. The interior of the building is in fair condition with only spot locations which show need for repair such as corridor ceiling tile damage due to pipe leakage. Although many classrooms have been fitted out with AV equipment the building would require additional systems remodeling for technology ready classrooms to bring the building up to campus standards equivalent to the recently built Health Science & Education Building and Warnock Building. Overall the infrastructure systems for this building are outdated and require upgrading.

For its time the glazed brick interior walls were typical of classroom buildings for K-12 as well as Higher Education. Although relatively maintenance free in terms of durability these unreinforced block & masonry infill walls actually present collapse hazards in the event of seismic movement because they are not laterally braced. During the structural evaluation walk-through it was noted that although this building is in very poor condition seismically it would be less expensive to upgrade than Orson Spencer Hall (OSH) because the structural frame connections between the two legs that form the "T" shaped plan are more readily accessed for a structural upgrade. However, to seismically upgrade Milton Bennion would require vacating the building similar to the situation at OSH. One of the largest drawbacks of seismically upgrading this building would be a solution that would require the installation of large cross braces along the north south exterior walls of the building. These would impede view and block daylight along the exterior face as well as disrupt the continuity of the 1960's glass curtain wall system. To seek interior solutions for the seismic strengthening would diminish the usable classroom space which is more problematic for a space challenged building such as Milton Bennion.

Structural Assessment

Building Description: The original structure was built in two phases, with the first phase commencing in 1958 and the second phase in 1961. The approximate total square footage of the building is 78,158. The building has 3 floors at an average 12 ft height for a total height of 36 ft. In addition to the 3 floors, there is a basement and crawl space areas.

The foundation is a system of reinforced concrete continuous and spot footings. The floor and roof framing are two-way concrete joists with a 2-1/2" concrete slab. Columns consist of wide flange steel columns for Phase I of construction and 20" and 24" square concrete columns for Phase II. Walls are a combination of cast-in-place, reinforced concrete walls with architectural brick veneer and glass window wall systems. The lateral force resisting system is reinforced concrete shearwalls with concrete roof and floor diaphragms.

RVS Information: This building received a final structural score of 1.2 and given a seismic rating of very poor.

Seismic Deficiencies: The shear walls which run north and south in the west wing increase the lateral forces in the building because of added forces due to the effects of extreme torsion. The existing concrete shear walls do not meet current building code requirements to resist the current code specified lateral forces. The "T" shape of the building creates adverse effects at the corners where the west wing joins the main building. The floor and roof diaphragms are not connected together where Phase I meets Phase II. Also, the floor and roof diaphragms do not have adequate anchorage to be able to transfer the current code lateral forces to the existing shear walls. The interior partitions are not laterally braced.



Milton Bennion Hall - Southern entrance view

Conclusion

As stated in the Building Assessment introductory page; for a final structural score of less than 2 the CMP team recommends that a detailed seismic evaluation be conducted. Milton Bennion's score of 1.2 would suggest that the extent and cost of seismically upgrading may outweigh its useful return on investment. Over the course of the CMP study the team met with the team preparing the "Disaster Resistant University" (DRU) study. Both teams consider Milton Bennion Hall as a replacement candidate; citing code deficiencies, outdated HVAC, and poor seismic condition as reasons to replace rather than renovate this building.



Typical block wall infill at corridors on all levels



Main Entrance on University Street

**S. J. Quinney College of Law -
Bldg. # 73**

Built: 1964

Size: 59, 872 GSF
College of Law

S. J. Quinney College of Law

The S.J. Quinney College of Law, has space in three buildings located in the southwest predominantly historic part of campus. The S.J. Quinney College of Law Building #73 houses the primary classrooms and seminar spaces; the moot court room, student reading room, lounge and carrel space as well as faculty and administrative offices. It is adjoined to the Law Library, Building #72, to the east via an enclosed glazed corridor to provide continuity between the two buildings. The neighboring Carlson Hall, Building #31, fills the need for additional College of Law faculty office space.

The 2003 Master Plan study of the S.J. Quinney College of Law and its buildings identifies space needs for current programs and future growth that far exceed the size of the currently available space. Building #73 is deficient in structural seismic and accessibility issues. Americans with Disabilities Act (ADA) compliance is weak in terms of limited accessible restrooms, drinking fountains, elevators, phones, stair rails, and the primary building entrance. The building lacks a comprehensive horn/strobe fire alarm system and an emergency lighting system for each egress pathway.

The HVAC systems in the building are inefficient, costly to operate and present noise and comfort hindrances to the teaching and learning environment. Overall the MEP Infrastructure systems are inadequate and predominately in poor condition. Upgrading of the electrical and technology infrastructure would be difficult due to the concrete construction which is not conducive to running cable requiring new penetrations. Long-term use of this building would require a complete mechanical HVAC system upgrade and replacement.

To appropriately assess a building's long term value, the building's location, site, and campus prominence weigh into its evaluation. As a basic premise of good land use planning, the Plan recommends that all built improvements demonstrate "highest and best use" of the land they occupy. This would translate into a recommended minimum of 3 stories for all buildings on campus. The College of Law site has a great deal of value in its location at the western edge of campus along the primary University Street. This current 1 ½ -2 story building is a poor use of its prominent site.

From a functional standpoint, Building #73 does not adequately meet the current or long term program needs of the S.J. Quinney College of Law. During the course of the Plan's building assessment study and space needs assessment, it became clear that this 1960s building held little promise of fulfilling the aspirations or vision that the College has put forth. There is a new paradigm in legal education similar to what is being sought in other disciplines with an emphasis on collegial interactions. Fundamental environmental and ergonomic goals such as access to natural daylight and improved indoor air quality are only a few of the criteria that impact a new building design strategy. They are not ones that would be achievable in the renovation of this existing building and would come at a cost commensurate with new construction.

The new Dean of the College of Law, Hiram Chodosh, has advanced the unique qualities of this College to promote interactive learning and more transparent access to faculty. Particular to this Dean's goals, creating a facility which merges resources whether they be faculty and staff or library information technology with traditional books into a collaborative environment is a plausible challenge for a new building, but a recipe for disappointment in a building that has little room to expand, lacks infrastructure and is seismically inadequate.

Structural

Building Description: The structure was built in 1964. The approximate total square footage of the building is 59,872. The building has 2 floors at an average 12 ft height for a total height of 24 ft. A cooling tower is attached at the roof level. The foundation is a system of reinforced concrete continuous and spot footings designed on a 3,000 psf allowable soil bearing pressure. The building can be described by two sections, north and south. The north half is a one story structure for large auditorium seating and classrooms. The gravity load elements of this section use a masonry bearing wall system. The south portion is two stories and is made up of classrooms and offices. The floor of the southern portion is composed of a one way span suspended concrete floor on a perimeter concrete beam and precast concrete column system. For the entire building, the roof framing consists of open web steel joists with metal decking and 2" of concrete topping. The lateral force resisting system consists of Reinforced masonry shear walls with 1-#4 @ 16" O.C. both ways. The north half of the structure (1 story) has details and sections that indicate all masonry to be tied into the roof structure.

RVS Information: This building received a final structural score of 1.2 and given a seismic rating of poor.

Seismic Deficiencies: The south half does not have ade-

quate seismic force resisting capability due to a lack of shear walls. The north portion by itself could be classified as fair except for the fact that it does not have adequate separation from the south portion.

Conclusion

The new leadership of the S.J. Quinney College of Law is once again examining the current and future needs of their College. A new feasibility study is underway. For the long-term use of Building #73, renovation and upgrade would be required to satisfy seismic safety requirements and to bring the building into code compliance. The result would yield a building that would not meet the goals of the college given the building's layout and configuration. The Plan would recommend construction of a new College of Law building located either at the Carlson Building #31 site or at the existing Bldg. #73 site, which would require a temporary relocation of the College of Law to a transitional space. Surge space is a limited commodity at the University. Depending on timing, the George Thomas Building is a possible candidate for temporary space; however this may conflict with the College of Fine Arts interest and timing for the reuse of the former UMNH space for their theatre program needs. It was also mentioned in the William Stewart Building #6 (WSB) evaluation (page 25) that WSB holds an adjacent "prominent" site on University Street and one that would be better suited to a professional school. In this scenario a new addition facing University Street could be built which would help to reinforce the existing WSB and afford the opportunity for a new model of legal education. Alternatively, the WSB could be replaced by a new College of Law facility. In short the evaluation for the College of Law's best strategy going forward should not be limited to the evaluation of their primary buildings alone. In this case, regional campus buildings & sites should once again be considered and phasing strategies for renovation and/or new construction be examined.

Kennecott - Building # 372

Built: 1950

Size: 60,000 GSF

College of Engineering



View of Kennecott from roof of Warnock - Sutton construction in foreground

Kennecott Building

The University has recently conducted a Feasibility Study for the remodel of the Kennecott Building in order to reuse the building for faculty offices and class labs for the College of Engineering.

The study provides a thorough assessment of the building's condition and renovation scenarios along with costs for this work. The study is included in the Appendix. The long term recommendations in the Plan are for the demolition of Kennecott and the realignment of the road through this site in order to provide a coherent and safe edge for this northwest region of the campus. New engineering buildings are envisioned along the revised Engineering Mall and will both create the western edge while allowing for better inter-relationship between the engineering buildings in this area.

Reaveley Engineering was part of the Feasibility Study team and have provided their structural seismic assessment of the building here as part of the CMP building assessment exercise.

Structural

Building Description: The original structure was built in 1950. The original Kennecott building consists of a two story structure that measures approximately 133 feet by 60 feet in plan, and a one story penthouse structure measuring approximately 70 feet by 27 feet in plan. The approximate square footage of the building including additions and expansions is 60,000. The building has 2 floors at an average height of 12 ft 10 in for a total height of 26 ft. In addition to the floors, there is a basement.

The foundation is a system of reinforced concrete continuous and spot footings. The structure is a reinforced concrete frame building with unreinforced masonry infill walls. Typical floors and roofs are a system of concrete slabs and one way pan joists. The lateral force resisting system of the structure consists of exterior and interior unreinforced masonry infill walls. In addition, at the basement level, reinforced concrete foundation walls are provided.

The unreinforced masonry infill walls are typically 8 inches thick and were designed as non-bearing masonry walls which contribute somewhat the lateral stiffness and strength of the upper levels of the existing structure at the early stages of seismic loading.

RVS Information: Not studied in 1989 evaluation. Recently received structural review for renovation recommendations.

Seismic Deficiencies: Roof diaphragms are not connected to the exterior walls. There is no evidence that the masonry infill walls are connected to the concrete/steel frames. The infill walls are the most rigid element which will attract the bulk of the seismic forces. Since these walls are not connected, forces cannot be successfully transferred into these walls. A mezzanine was added at the second level. It does not appear this diaphragm was anchored to the building lateral force resisting system nor does it have an independent lateral force resisting system. The north expansion could be considered a soft story. The 'L' shaped configuration of the adjoining central and east wings leads to an irregular configuration of mass and rigidity that causes an amplified torsional effect where the center of mass and center of rigidity do not coincide.

Conclusions

The CMP team would recommend that the University prudently approach this project in terms of its long term ability to serve the College of Engineering needs. Its location on the west side of North Campus Drive has been the subject of much concern for the welfare of students negotiating this roadway. The building does not meet ADA accessibility requirements and will require significant upgrade for long term re-use. Large expenditures to upgrade this facility will persuade the University to put off the roadway realignment. The CMP recommends that a Feasibility Study for the roadway realignment be conducted to determine the cost of the realignment and establish a reasonable timeframe for this work. Then the viability of the Kennecott renovation can be more appropriately understood in light of the overall campus plan.

The Kennecott Building is used by the College of Engineering for faculty offices and program spaces. It was remodeled in 2001. As per the recent renovation study conducted for the University, the building still needs extensive work including interior carpet and ceiling tile replacement, bathroom remodeling, ADA upgrades, fire life safety upgrades and stair code compliance. The brick facade is in good condition.



Fort Douglas Army Reserve

James C. Bungard Hall - Bldg. # 100

Barn - Bldg. # 101

Theron Draper Hall - Bldg. # 102

Franklin McKean Hall - Bldg. # 103

Leopold A. Yost Hall - Bldg. # 104

George W. Latimer Hall - Bldg. # 105

Edward C. Watson Hall - Bldg. # 106

H. Lynn Ostler Hall - Bldg. # 107

Victor L. Olson Hall - Bldg. # 108

Fort Douglas

As noted in the history section at the beginning of the report, the relationship between the Fort Douglas installation and The University of Utah is as old as the University itself. The same 2,000 acres that were originally set aside by the State of Utah for the development of a state university proper were in fact adapted as a Federal military encampment taking advantage of the excellent vantage point for surveying the entire valley and the convenient proximity to the growing Salt Lake City settlement. Over time, the Federal government has periodically transferred land to the University's jurisdiction, the most recent being the historic Officers Circle and the parade ground. Given the historic nature of this property and the associated structures, the University invested a substantial amount of capital restoring the Officers Circle residences for honor's residences for the various colleges and programs. Currently the University is in the process of acquiring some portion or all of the remaining Fort Douglas property.

The effort in this building assessment study as it regards Fort Douglas was to determine, based on a visual assessment walk-through, the basic condition of the various buildings comprising the current area of the Fort Douglas Federal Army Reserve and the possible re-use scenarios that might be considered. SOM engaged

Reaveley Engineering in the assessment process to provide a high-level examination of the buildings' structural integrity and to outline structural and seismic upgrades that the University would expect would be necessary to utilize the buildings for University occupancy.

The 100 series buildings that comprise the Soldiers Circle were all built within a 10 year period of uniform construction methods. They are unreinforced masonry exterior walls with steel frame floor diaphragms. According to Reaveley's Structure/Seismic assessment: From an architectural standpoint, the buildings are well detailed with stone bases, brick composite walls and wood frame roof construction.

The exterior brick face looks to have been maintained well with localized areas of mortar decay. At the time of a seismic upgrade which would involve tying the exterior brick wall to the diaphragm, brick repointing should be included.

Complete Mechanical Upgrade

The buildings lack central cooling systems for the most part. The majority utilize window air conditioning units. Buildings 108 and 109 have relatively new central exhaust fans located in the attic space.



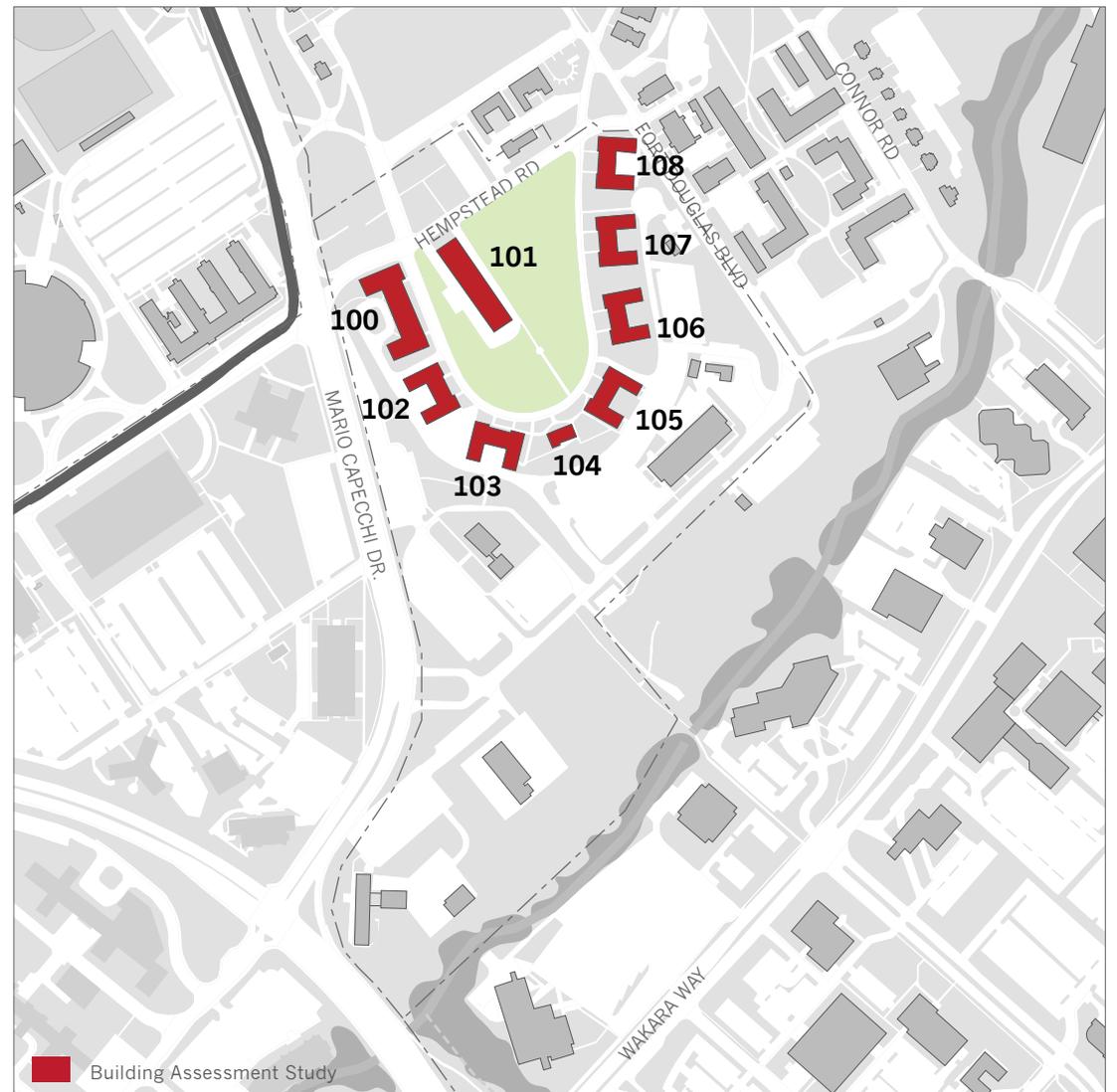
Soldiers Circle of historic army residences surrounds the central green

Program Re-use Candidates for Fort Douglas

The University has asked that the program re-use options for Fort Douglas include student housing and/or university support services.

From a site perspective, location and present arrangement of buildings around a central yard would complement residential buildings. One could easily see the central yard as a playground for the children in Married Student housing. The current villages are appreciated by their occupants primarily for the central space that is a common playground that is contained which allows parents to share monitoring their children's whereabouts and safety. It also provides a sense of neighborhood community that is valued. Although the original buildings at Fort Douglas were built as housing for enlisted men, the plumbing facilities are very limited. Showers were provided in the basement. If these buildings were to be used for student housing, a gut remodel would be required to include residential kitchen and bathroom provisions. Re-use of the buildings as general office space, which the current buildings support, would be a less expensive route.

Another approach to re-use of the remaining Fort Douglas property could be to request space in a similar manner that has occurred over the past century, which



nts

Fort Douglas



has been in a number of stages which could allow for earlier acquisition of usable space for the University.

The University is in need of swing space to relocate the occupants of various existing buildings on campus which have been identified for upgrading or replacement. It is difficult to receive state funding for a building that would be deemed swing space. With that in mind, the inventory of space at Fort Douglas is very appealing. One possible request would include two buildings – 100 and 101. Building 101 is the historic barn currently underutilized for storage. The University’s building and grounds team could be housed in the Bldg 101, along with a portion of their equipment with direct access off Hempstead Road. Their larger equipment, i.e.: snow removal plows would require another location as their size exceeds the dimensions of the barn’s capacity.

It appears possible to reorganize the fencing of the Fort property to give the University access to the western edge of the property via Wasatch and Ft. Douglas Drive. Building 100 is 60,000 gsf which could house the

entire Facilities Management team with shops on the ground floor and access off the western loading dock area. If the Fort boundary moved back 800 feet from Wasatch, the parking lot along this edge could be utilized as a university park & ride shuttle supporting the staff parking zone. Satellite garage holding space for large tractor mowers may still be required on the main campus, but this may be incorporated into regional developments such as USTAR and the University Ambulatory Complex parking structure.

Layouts for buildings 102-108 are similar. Originally the buildings had front porches constructed of wood. The brick has been filled in on the second floor door openings and converted to window sashes. Building 104 is the only building which still has its original porches. Rear porches and exterior stairs remain for the majority of the buildings. The buildings are “U” shaped plans with a narrow depth to provide through-ventilation.

Structural tie backs to stabilize the exterior brick walls are evident in buildings 102, 103 and 104.



Rear ring road access to buildings



Pastoral setting with mature trees and grand lawns



Rear building views of porches

Structural Assessment

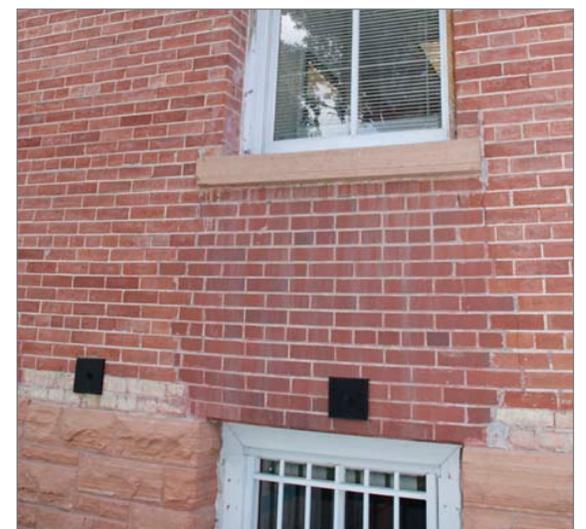
A general description of each building to be studied and known seismic deficiencies are given below. The general descriptions are made from visual observations, previous reports and other limited sources of information at the time of the report. Due to the dates of a number of sources, some of the buildings may have undergone renovations, remodels, or other changes which may not be reflected in the general descriptions. The number of each building represents the building number assigned by Fort Douglas.

Seismic Deficiencies, Buildings 100 through 108: The buildings were not designed with any earthquake lateral force resisting elements to resist earthquake effects. The roof sheathing does not provide adequate transfer of diaphragm shear induced by earthquake loads. The roof and floor diaphragms do not have adequate anchorage to be able to transfer the current code lateral forces to the existing shear walls. Masonry exterior walls are unreinforced and therefore provide limited shear capacity for a seismic event.

For buildings 100, 102, 103 and 105-108, the “U” shape of the building creates adverse effects at the corners where the wings join the main building. Some of the structures have been partially upgraded with added seismic anchorage of the exterior walls to prevent them from falling outward during an earthquake. These anchors consist of steel rods drilled through the wall at floor levels at three to four feet on center. The rods connect to the floor framing on the inside and to a steel plate on the outside.

General Description of Buildings 102 through 108

Buildings 102 through 108 were all built between 1904 and 1910 with similar construction and configuration except building 104 which is significantly smaller than the other buildings and is not constructed in the typical “U” shape. The foundations are sandstone block with both continuous and spot footings. The exterior and interior bearing walls consist of unreinforced masonry. The roofs and floors are framed with solid wood joists, beams, and columns. Lateral force resisting systems consist of partial diaphragms with little or no connection to unreinforced masonry shear walls.



Exterior and interior views and details

James C. Bungard Hall

Bldg. #100

Built: 1939

Size: 57,244 GSF



Building 100

Building Description: The structure was built in 1939 making it one of the most recent structures at Fort Douglas. The foundation walls consist of reinforced concrete. The building is a two story reinforced concrete frame structure. Columns are 17” by 17” reinforced concrete. Column gridlines are approximately 16’ by 18’-6”. The roof is framed with wood joists at 16 in O.C. and wood sheathing. Walls at gables are 12” thick with clay tiles on the interior and brick on the exterior.

Seismic Deficiencies: Although this building is constructed with reinforced concrete foundations and reinforced concrete columns and floor slabs, the seismic deficiencies for buildings 100 through 108 are still applicable. The general lateral force resisting system relies on the un-reinforced masonry wall for lateral resistance as with the other buildings.

Building 101

Building Description: Building 101 was built in 1886 as a stable for ninety-six horses. Exterior walls are built of red sandstone block. In 1922 it was converted into a storehouse at which time a concrete floor was added, roof trusses strengthened, decayed support timbers replaced, and new shingles placed on the roof. The building experienced another remodel in 1933 when the lean-to along the entire east side was built and along the west side in 1934.

Seismic Deficiencies: This long, narrow structure has very little lateral bracing between the end walls in the crosswise direction. The roof diaphragm is too flexible and does not have the strength to resist the seismic demands. Wind forces in the crosswise direction are resisted by the massive stone walls cantilevering from the foundations. The mass that helps resist wind forces, however will only add to the seismic forces.

Barn Bldg. # 101

Built: 1886

Size: 1,950 GSF



Regularly spaced new shear walls in the crosswise direction will be necessary. A new plywood (OSB) roof diaphragm adequately attached with drilled epoxy anchors would be necessary to provide a moderate level of seismic performance.

Building 102

Building Description: The building consists of two story masonry bearing wall construction with full basements. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.

Building 103

Building Description: The building consists of two story masonry bearing wall construction. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.

Building 104

Building Description: The building is listed in the National Register of Historic Places on the national and state historic registers. The front of the building faces north and is located on Soldiers Circle. This building is significantly smaller than the other buildings on Soldiers Circle and is not constructed in the typical “U” configuration.

The building consists of two floors and a basement. The story heights are approximately 12'-9" tall. The roof is sloped and has a pitch of 8" rise per 12" run. This equates to an attic height of 8' at the peak. The building has a main body with two small wings at each end. The main body is 30'-4" by 30'-0". The wings are 22'-11" by 39'-0".



Theron Draper Hall

Bldg. # 102

Built: 1910

Size: 33,240 GSF



Franklin McKean Hall

Bldg. # 103

Built: 1910

Size: 33,240 GSF



Leopold A. Yost Hall

Bldg. #1 04

Built: 1910

Size: 8,082 GSF



Leopold A. Yost Hall - Bldg. # 104 North west view

The exterior walls are 15” thick unreinforced brick masonry, the interior walls appear to be 6” wood stud walls with lath and plaster on each face. The lintels over the doorways in some of the interior bearing walls appear to be framed with wood members.

The floor has diagonal sheathing that has been overlaid with another layer of sheathing at some later date. The floor is framed with 2” by 12” joists at 16” O.C. The joists at the wings span 22’ east to west and are pocketed into the masonry walls. The joists in the main portion of the building span north and south between the exterior and interior masonry walls. The greatest span is approximately 11’. The joists have wire and plaster attached to the bottom. The plaster is painted with lead paint that is considered a hazardous material and thus has special requirements for the method of removal.

George W. Latimer Hall
Bldg. # 105
Built: 1910
Size: 33,240 GSF



Building 105

Building Description: The building consists of two story masonry bearing wall construction. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.

Building 106

Building Description: The building consists of two story masonry bearing wall construction. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.



**Edward C. Watson
Bldg. # 106**
Built: 1910
Size: 33,240 GSF

Building 107

Building Description: The building consists of two story masonry bearing wall construction. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.



**H. Lynn Ostler Hall
Bldg. # 107**
Built: 1905
Size: 33,240 GSF

Building 108

Building Description: The building consists of two story masonry bearing wall construction. Non-structural remodels happened in 1936 and the late 1940s. After World War II, the building was converted from barracks use to classroom, office and medical use.



**Victor L. Olson Hall
Bldg. # 108**
Built: 1904
Size: 33,240 GSF

Predisaster Mitigation Planning at The University of Utah

Disasters impacting institutions across the country have heightened awareness that universities are not immune from damage. From earthquakes along the California coast, through flooding and tornados in the mid-west to hurricanes along the eastern coasts, the financial and operational impact on higher education has been significant, prompting FEMA and sectors from higher education to partner in support of the development of effective pre-disaster mitigation strategies. The University of Utah applied for and was awarded FEMA's competitive pre-disaster mitigation grant in 2005. The work plan outlined a process for collecting, organizing and analyzing hazard data specific to the University from which to develop a community supported strategy for quantifying risk and prioritizing efforts to mitigate those risks. The initial findings were shared with SOM in this Master Planning effort in November, 2007.

Effective pre-disaster mitigation (PDM) requires development of and adherence to organizational guidelines and policies which articulate a community's desire to protect its assets. In the lexicon for this project, those are the operating guidelines, the vision, mission, goals, objectives, and strategies upon which the road to project completion must be constructed.

The University's Disaster Resistant University (DRU) Advisory Committee defined those guidelines and statements. Appointed by Senior Vice President David Pershing, this group is comprised of senior level administrators representing the majority of constituent groups at The University of Utah, including students and alumni. Also represented on this Committee are emergency planning experts from Salt Lake City and the State of Utah. Some of the results of their collective efforts are detailed below.

Opportunities exist via FEMA for financial support to correct pre-identified hazards to life safety and operational interruptions. If FEMA had opportunity to review and approve a mitigation strategy in advance, many University planned projects would be eligible.

I. VISION AND MISSION

Vision

To eliminate issues The University of Utah must otherwise address after a catastrophic disaster, primarily a significant seismic event.

Mission

To identify, define, and implement those pre-disaster mitigation actions that provide "maximum bang for the buck" and will insure the greatest benefit to stakeholders of The University of Utah.

Strategy

Armed with an understanding of risks and degree of threat posed to the University by known hazards, we will engage our community in identifying and prioritizing specific mitigation actions, and in defining processes appropriate for the implementation of preferred actions.

II. GOALS AND OBJECTIVES

Goal 1 – Preserve life safety

Objectives:

1. Reduce the risk of catastrophic failure in occupied spaces
2. Minimize secondary hazards present after an earthquake (falling objects, blocked exits)
3. Protect critical response facilities

Goal 2 – Protect University assets and investments*Objectives:*

1. Reduce the risk of catastrophic failure in high value spaces
2. Minimize secondary hazards to high value assets (equipment, collections, records, samples)
3. Protect the greater environment

Goal 3 – Ensure continuity of mission critical functions*Objectives:*

1. Reduce the risk of catastrophic failure to critical infrastructure
2. Minimize disruption to critical support functions
3. Protect business resumption capabilities

III. Defining Criteria**1. MISSION CRITICAL: Uninterruptible***Criteria:*

- Functions are critical to the mission of the University or the welfare of the state
- Design should minimize risk of interruption
- In case of interruption, functions must be restored or relocated immediately

Examples:

- Emergency Operations Team
- Medical Services and Patient Care
- Public Safety
- Critical Infrastructure
- Hazardous Materials Handling
- Communications

2. MISSION CORE: Urgent Restoration*Criteria:*

- Functions are central to the mission of the University or impact community
- Design should minimize risk of interruption

- In case of interruption, functions should be restored or relocated on an urgent basis

Examples:

- Student Degree Support (means must be found for students to complete studies on time)
- Student Housing
- Certain Research Programs
- Certain Service Programs (i.e. counseling, community services)
- Library Services and Museums
- Administrative Data Systems
- Designated Administrative and Research Support Functions
- Remaining Infrastructure

3. MISSION SUPPORT: Restoration as Possible*Criteria:*

- Functions are part of the mission of the University
- Not targeted for application of prevention resources
- In case of interruption, functions will be restored or relocated as resources are available

Conclusion

Mitigation strategies do not drive, but inform, Master Planning. At the conclusion of the activities associated with the DRU project, The University of Utah will have a better understanding of its natural and technological vulnerabilities and with that, enhanced opportunities to address those concerns during renovation and restoration projects identified through Master Planning. The current cycle of Master Planning has established a permanent link between traditional Master Planning and “disaster resistant university” mitigation planning. There is a commitment at The University of Utah to provide and maintain a permanent linkage between these two parallel planning activities in any future discussions and to update both sets of planning activities.

