

NORTHERN
ARIZONA
UNIVERSITY



FLAGSTAFF CAMPUS 2010 MASTER PLAN



Northern Arizona University's mission is to provide an outstanding undergraduate residential education strengthened by research, graduate and professional programs and sophisticated methods of distance delivery. The Flagstaff campus should be the fullest expression of the university's mission within its unique setting in northern Arizona.

LETTER FROM THE PRESIDENT



On behalf of Northern Arizona University, I am pleased to share with you our new master plan for the Flagstaff campus. As we adapt to meet the needs of a changing world, this plan will help guide the structural evolution of our campus, and will allow us to continue our mission for many years to come.

Our vision is for a campus that is dynamic and functional, and that balances the needs of faculty, students, drivers, and pedestrians. In keeping with our strong commitment to sustainable principles and practices, the new plan allows for much-needed redevelopment and the inclusion of open green spaces. We also want our campus to keenly reflect the unique and splendid setting that is the heritage of Northern Arizona University.

Encompassing a full year of collaborative development, the master planning process included input from student associations, major university departments, adjacent residential communities, the City of Flagstaff, and other key constituents. Together we crafted a long term strategy that responsibly and intelligently plans for renewal and future needs, and that ultimately seeks to create a more workable, livable, and sustainable campus.

We are a remarkable community of students, faculty, and staff committed to our future through the alignment of resources to meet strategic goals. Our master plan will serve as a guide for sustainably addressing functional and programmatic relationships, environmental issues and green space, vehicular and pedestrian traffic patterns, architectural character, and future development.

This master plan acknowledges the history and spirit found on the Flagstaff campus. It also points the way to a more purposeful, well-designed campus – one that will help carry our teaching, research, and mission of student service into the next decade and beyond.

A handwritten signature in white ink that reads "John D. Hagen". The signature is written in a cursive, flowing style.



NORTHERN
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UNIVERSITY

FINAL REPORT





INTRODUCTION



Northern Arizona University is a vibrant community committed to teaching as learning, research as innovation, and service as shared leadership.

From humble beginnings as a territorial Normal School in 1899, Northern Arizona University has grown to become one of the state's leading universities, committed to outstanding undergraduate residential education strengthened by research, graduate and professional programs and sophisticated methods of distance delivery. Nestled below the San Francisco Peaks, the campus in Flagstaff has historically been the identity of the university and is still the flagship campus. From a single building on donated railroad land, the Flagstaff campus has grown to 738 acres with 5.7 million square feet in more than 100 buildings. The university offers 85 academic programs and pre-professional programs in six colleges. The W.A. Franke College of Business is among 15 graduate schools nationwide that students rated most highly and in 2010 was included in the Princeton Review's "The Best 301 Business Schools". The undergraduate engineering program has been ranked among the best in the nation by U.S. News and World Report for the last five consecutive years.

By focusing on undergraduate education and outreach programs, Northern Arizona University offers the most affordable public university programs in the state and with 34 campus locations can rightfully claim to serve the entire state of Arizona. Over a third of Northern Arizona University's students are enrolled at these extended campuses and while the university continues to expand with statewide outreach programs and distance learning, the Flagstaff campus also continues to experience increasing enrollment. This master plan focuses on establishing a long-term vision for the Flagstaff campus and its unique setting.

First Amendment Plaza

"Congress shall not
or prohibiting the
of speech, or of
assemble, and to



CONTEXT

The Arizona Board of Regents 2020 Vision set a goal for Northern Arizona University enrollment to increase to 35,000 total students statewide which included 18,500 students on the Flagstaff campus. With 2020 still ten years away, the University has grown to over 16,000 students on the Flagstaff campus and is projecting continued growth. In 2010 the Board updated enrollment projections to 25,000 students on the Flagstaff campus by 2020 or soon after. The master plan identifies strategies to accommodate the university's expectations for growth with effective and responsible use of resources to meet the goals for academic excellence set by the Regents.

PROCESS

In the fall of 2009, Northern Arizona University embarked on a comprehensive master planning process to respond to rapidly changing and increasingly challenging conditions. While state resources were shrinking the university's enrollment demands were growing, increasing pressure on the campus and facilities to meet the needs of the burgeoning student body. Ayers Saint Gross, the consulting firm for the 2005 master plan and several subsequent planning studies and updates, was asked to lead the master planning process. While complying with Arizona Board of Regents policy to update campus master plans every five years, the team was charged with developing a plan that was not simply an updated reiteration of the previous plan. Rather, the 2010 master plan needed to integrate all that had been accomplished since the 2005 plan with fresh thinking about the development of the campus looking forward to 2020 and beyond. The year long planning process was guided by a master plan steering committee which included broad representation from the student association, major university departments, colleges and committees, and the City of Flagstaff.

OBJECTIVES

Early in the planning the steering committee identified objectives for the 2010 master plan, including:

- Develop a long term road map to guide immediate decisions;
- Integrate academics and student life;
- Support recruitment and retention of students, faculty, staff;
- Accommodate enrollment growth;
- Create campus and community connections;
- Apply sustainability principles.

The master plan was charged with updating the campus plan to include projects completed, or in the process of being completed, since 2005 and integrating the planning efforts which had unfolded since the completion of the 2005 master plan. These included: the signage and identity plan, parking structures plan, athletics master plan, wellness and recreation study, housing plans, 2008 transportation study, 2009-10 deferred maintenance study and several individual project studies.

2005 PLAN

The 2005 Master Plan approved by the Arizona Board of Regents looked at the overall development of the campus, while addressing specific studies for a new conference center and athletic facilities. In 2005 Arizona was in the midst of a major expansion and Northern Arizona University was experiencing renewed enrollment growth. The result was a very ambitious master plan which looked at long range build-out of the campus and forecast the replacement of many of the existing buildings as the campus redeveloped several phases.

Goals of the 2005 Master Plan

- Reinforce and enhance campus zones, edges and gateways,
- Plan for accommodating enrollment growth with a new conference center, expansion of arena and athletics facilities and new student housing.
- Create and strengthen connections within campus and to the Flagstaff community.



IMPLEMENTATION 2005 TO 2010

The 2005 plan has successfully guided 5 years of campus growth and development. Projects completed include:

High Country Conference Center and Parking Garage

Science Lab Building

Extended Campus's Addition

University Union Dining Expansion

Knoles Parking Garage
w/landscaped open space

Aspen Crossing Student Housing

Applied Research & Development Building

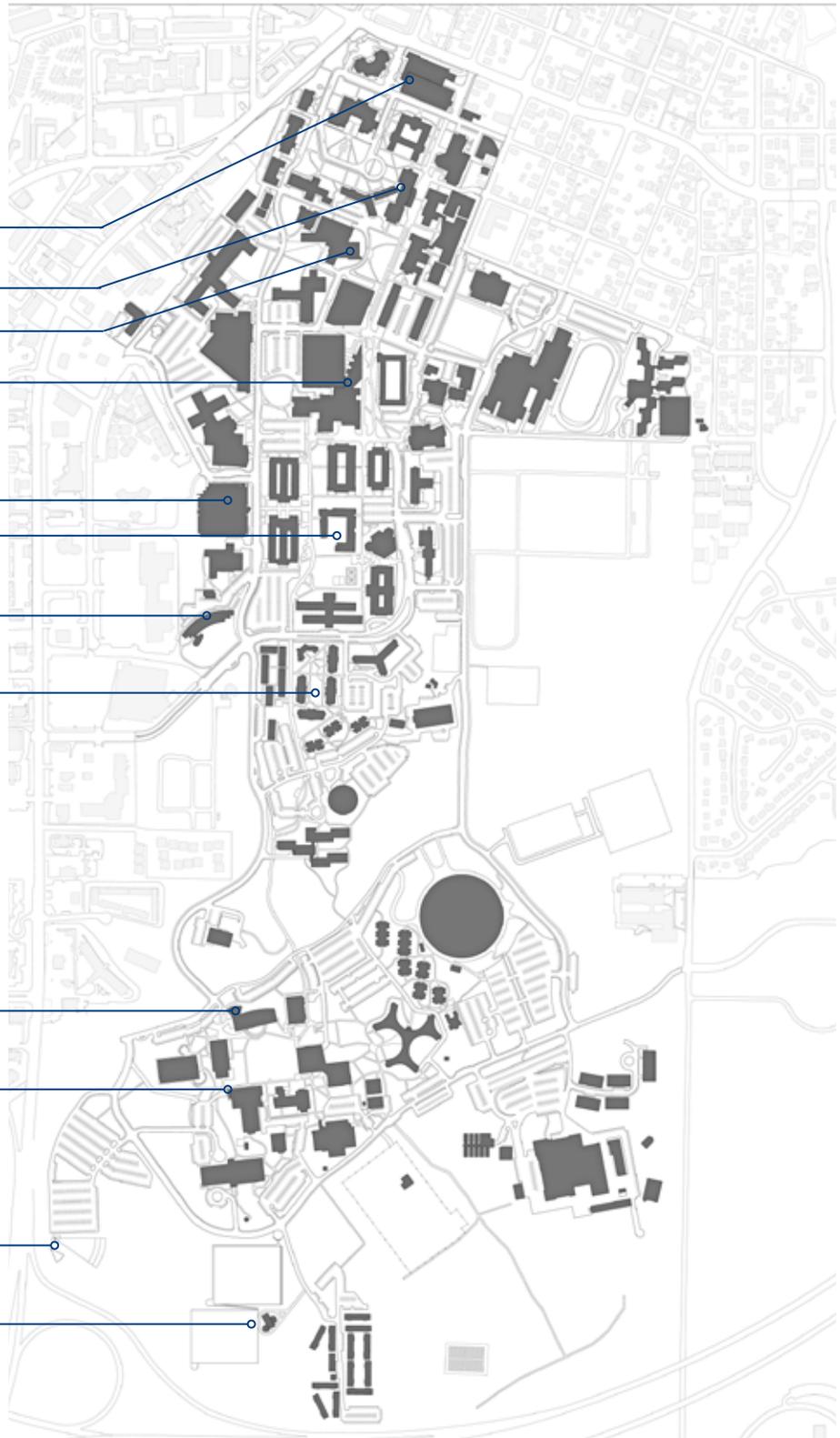
McKay Student Housing

W. A. Franke College of Business

Engineering Building Expansion

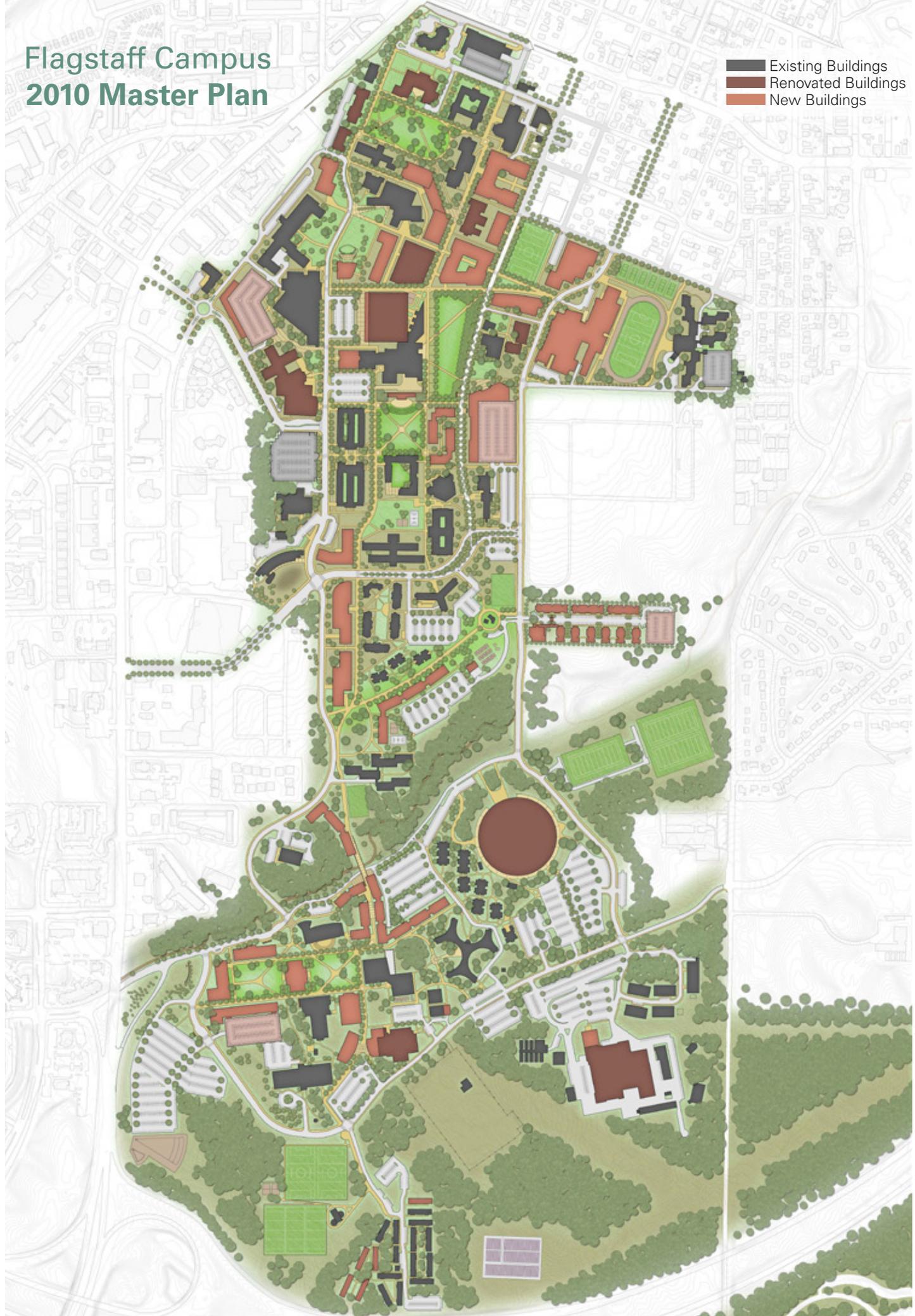
New Collegiate Throwing Field Arena

Recreational Fields and Pavilion



Flagstaff Campus 2010 Master Plan

- Existing Buildings
- Renovated Buildings
- New Buildings



GUIDING PRINCIPLES

Three guiding principles were developed at the beginning of the process to guide the development of the campus master plan. These principles were considered during each workshop and shaped discussion within the university community. These principles will continue to guide the physical development of the campus into the future.

NOTHING CONSIDERED IN ISOLATION

- Integrate all aspects of development planning from strategic goal setting through academic planning and facilities programming;
- Clarify campus organization to use land more efficiently and sustainably;
- Connect the campus to integrate academics and student life;
- Integrate new building projects with supportive infrastructure improvements;
- Implement the plan considering phasing, operations and maintenance;
- Coordinate campus planning and development with the City of Flagstaff and regional planning agencies.

CELEBRATE SUSTAINABILITY

- Continue the University's leadership in sustainability by applying responsible sustainable practices to campus development;
- Embrace and protect the Flagstaff campus through environmental stewardship and best conservation practices;
- Strengthen connections to the unique natural setting by preserving mountain view sheds and native landscapes;
- Increase the density of core academic space and student housing on-campus supported by transit, bike paths and the pedestrian spine.

ATTRACT AND RETAIN

- Develop a more attractive and functional campus to aid in the attraction, recruitment and retention of talented students, faculty and staff;
- Improve quality and functionality of campus facilities supporting the highest quality of teaching, research, athletics and student life;
- Simplify the campus circulation system, prioritizing pedestrians and bicycles;
- Enhance campus landscaped open space by removing parking from the core to perimeter parking structures;
- Strengthen ties to the surrounding neighborhoods, City of Flagstaff and the greater region.



Northern Arizona University Strategic Needs: 2010 Forward

- Increase enrollment at Flagstaff campus to ~25,000 students.
- Improve retention to 85%.
- Continue research expansion at Flagstaff to ~ \$100 million.
- Increase online & community campus enrollment to ~10,000.
- Expand community college partnerships, joint admissions and other innovative learning options.

PRINCIPLE ONE

NOTHING CONSIDERED IN ISOLATION

The plan integrates all aspects of development planning to accommodate the goals for enrollment growth and academic quality established by the Arizona Board of Regents 2020 Vision Plan and the Northern Arizona University strategic and academic plans. The Strategic Plan identifies the need to respond to increasing enrollment pressures. Over the last three years, the University has seen a total enrollment increase of almost 24%, primarily in undergraduate on-campus students. The Strategic Plan projects growth in enrollment on the Flagstaff mountain campus from just under 15,000 students in Fall 2009 to an estimated 18,500 students by 2014 and over 25,000 students by 2020. The master plan illustrates a campus plan which accommodates this growth in enrollment, supports improved retention and graduation rates, and provides facilities for expanded programs and degree offerings.

Analysis of Northern Arizona University's current and projected space needs identified 3.25 million gross area of existing academic and support facilities. However, the campus will soon reach a point where the physical facilities will constrain the ability of the University to meet the projected increased enrollment. With a cumulative projected increase in enrollment of over 36% by 2020, the Flagstaff campus will need to add 1.2 million gross square feet of new buildings, in addition to the renovation or replacement of over half a million gross square feet of existing substandard facilities.



Northern Arizona University was listed in the Princeton Review's Guide to 286 Green Colleges for demonstrating "an exemplary commitment to sustainability."





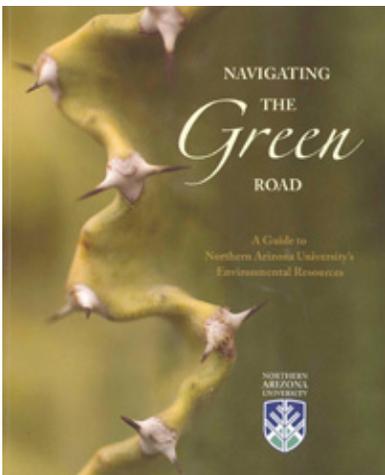
Applied Research & Development building, certified LEED Platinum

PRINCIPLE TWO

CELEBRATE SUSTAINABILITY

Located on the Colorado Plateau and surrounded by national forests and parks, Northern Arizona University is situated in a unique regional ecosystem rich in biodiversity. This environment forms the foundation for the university’s program of integrated environmental education, research and leadership. President Haeger was a charter signatory of the American College and University Presidents Climate Commitment and over the last 10 years Northern Arizona University has been quietly leading the way in applied sustainability.

The 2010 Master Plan supports this commitment by: increasing the density of the campus core; incorporating the transit spine and improved pedestrian paths and bikeways to reduce demand for parking; replacing surface parking with perimeter parking structures; reducing impermeable surfaces by replacing asphalt parking lots with landscaped open space and providing for storm water retention and management; expanding the existing reclaimed water system for irrigation; recommending strategies for additional renewable energy such as expanding the south campus solar array and adding PV solar shades on future parking structures; and incorporating the campus standards requiring new buildings to achieve USGBC certification at LEED Silver or above.

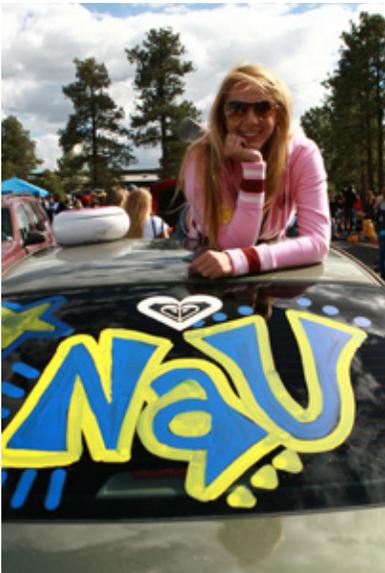


PRINCIPLE THREE

ATTRACT AND RETAIN

The master plan envisions improvements to create a more attractive and functional campus to aid in the attraction, recruitment and retention of talented students, faculty and staff. Many existing classrooms and teaching labs are in poor condition, resulting in low utilization. The proposed program of building expansions, renovations and replacements will improve the quality and functionality of campus facilities to be able to support the highest quality of teaching, research, athletics and student life.

Many of the proposed improvements focus on campus circulation by prioritizing pedestrians and bicycles. These improvements support sustainability and well as enhancing the character and quality of campus life. Relocating surface parking to perimeter parking garages reduces traffic, improves air quality and opens up new sites for buildings and landscaped open spaces.







OBSERVATIONS + ANALYSIS



The 2010 planning began with analyzing the campus and the larger context, looking at past, present and potential future. Historic photos, including many aerial images, demonstrated the growth of the campus over time. The analysis incorporated not only the built environment of the campus, but also the history and culture of the institution, students, staff, faculty and alumni to reflect the whole university community.

To kick-off the planning process, Northern Arizona University established a Master Plan Steering Committee with broad representation including the student association, university departments and colleges and various campus committees. The university also invited participation from the City of Flagstaff, the Flagstaff Metropolitan Planning Organization, the Northern Arizona Intergovernmental Public Transportation Authority, the Flagstaff Dark Skies Coalition, the Flagstaff City Council, the Coconino County Board of Supervisors and interested community members from adjacent neighborhoods and bicyclist and trails organizations. An Executive Committee, which included the President, Provost and Vice Presidents, provided leadership and assurance that the plan would have the institutional support needed for implementation. Capital Assets departmental staff managed the project and provided the team with direction at each step of the planning process.



The central challenge was how to better knit the north, south and mid-campus areas into a single unified whole which expressed the unique qualities of the mountain campus.

The master planning process took a full year, from the initial site visit to approval by the Arizona Board of Regents. With years of past planning work to build upon, the master planning team began by walking the campus and observing the changes over the previous five years. Several major projects were under construction, including upgrades to the North Central Plant and the new Health and Learning Center. The team presented their observations and led the Steering Committee in developing Planning Principles to guide future campus development. Based on analysis of all aspects of the campus (circulation, transportation, land uses, parking, etc.) some initial organizing concepts were explored.

Four workshops were held on campus, culminating in open forums for students, faculty and staff and the community at large. Focus sessions with various departments, faculty and staff addressed specific issues: sustainability, central plant and utilities, lighting, athletics and recreation, landscape and open space, academics and research. Further exploration synthesized organizing elements around which the master plan concepts would be shaped.

At each stage of the planning process, the university reached out to the community with evening workshop sessions. These sessions opened up communications in a positive way and cleared up misconceptions about the University's boundaries and future plans. After a kick-off session held on campus, the public sessions were moved to the Murdock Community Center to increase community participation. The first off-campus session also included a tour of the neighborhoods immediately adjacent to the campus. Community members were able to show the design team how their neighborhoods are impacted by day to day university activities.

In June the final plan was presented to the President's Cabinet and approved. The master plan was presented at the September meeting of the Arizona Board of Regents (ABOR) and approved at the December 2010 ABOR meeting.



Above: Pedway mountain view; view corridor diagram; campus topography.

OBSERVATIONS

Campus-wide:

- view to the mountain is the most dramatic quality of this campus
- feels like two separate campuses – north and south campus
- pedway is the central organizing element
- pedway changes in character (width, materials) as it moves through the campus
- on foot or bicycle is the best way to travel across campus
- class transition periods snarl traffic with north-south movement
- buses are in high demand but travel times need to be reduced
- much of the campus is marred by surface parking and low scale buildings (1-2 stories) which do not make up a coherent whole

North Campus:

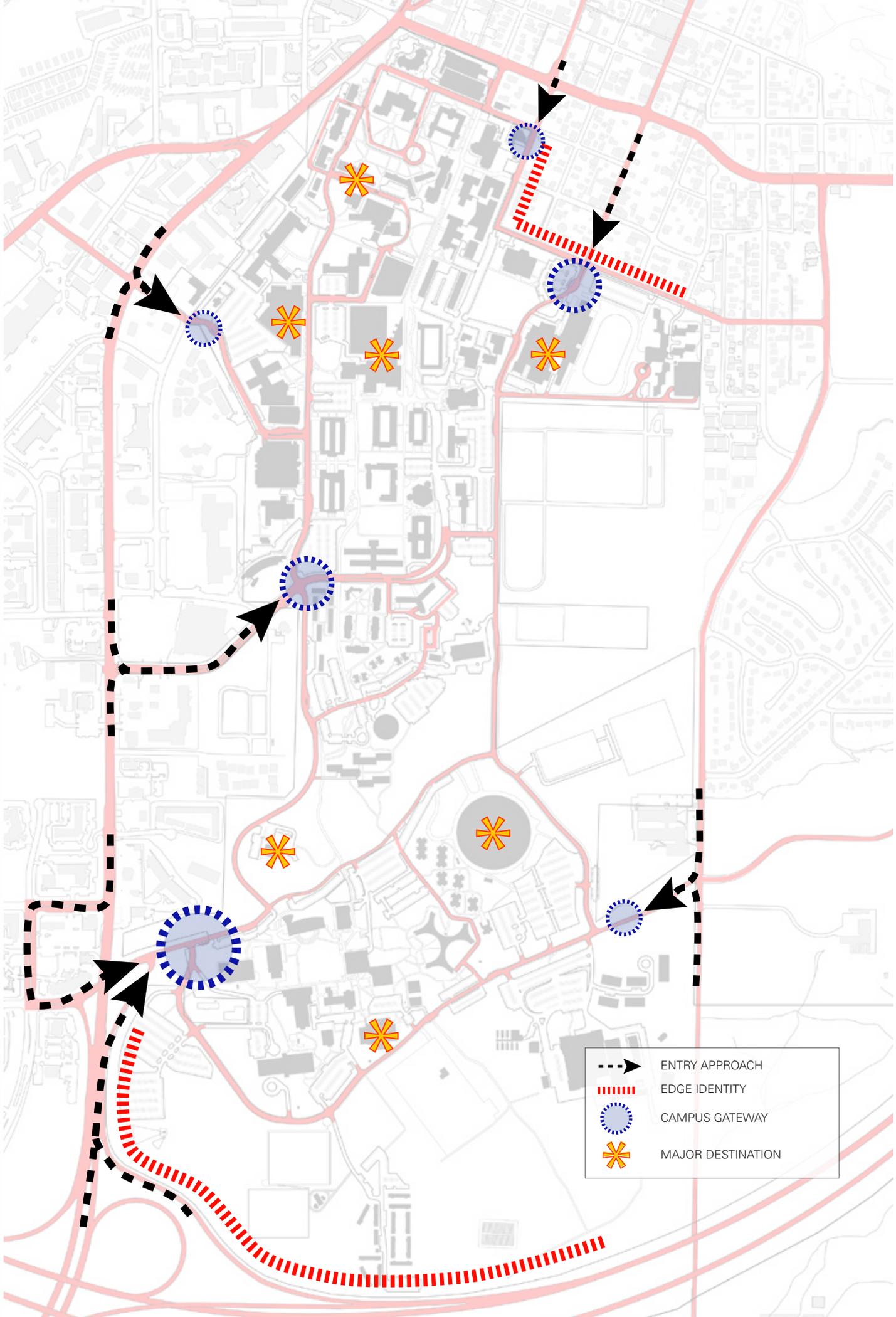
- historic district and north quad have a beautiful campus feel; when alumni speak of the campus with nostalgia, it is usually this area they refer to
- the most dense section of the campus, building is difficult
- core includes the library, auditorium, fieldhouse and the student union
- north campus pedway has a more urban, academic feel
- some older dorms have been repurposed as academic offices
- lacks a central traditional mall or open space
- pedway splits through the southern residential area, with confusing shifts

Mid-Campus:

- mostly residential buildings, with a wide range of types and styles
- more informal open spaces and recreational areas
- high point of the campus at observatory (now considered historic)
- natural 'high plains' landscape, with native grasses and pines
- pedway becomes a steep winding path to cross Sinclair Wash
- asphalt paved parking areas surround housing
- portions of the pedway are a former roadway in poor condition

South Campus:

- planned and built as a separate campus;
- 1960's architecture, several building have exceeded their useful life
- suburban campus feel, surrounded by large surface parking lots
- central space is a large open grassy quad which suffers from a lack of trees
- less formal landscaping
- Skydome architecture creates a memorable skyline
- mid campus and south campus challenging topography
- pedway fades out south of the quad
- new buildings and additions, such as the Engineering Building expansion and Franke School of Business, are modernizing the image of the campus.



- > ENTRY APPROACH
- EDGE IDENTITY
- ⊙ CAMPUS GATEWAY
- * MAJOR DESTINATION



GATEWAYS

Well defined gateways establish identity and sense of place, conveying the university brand. These are the first points of contact for potential students and their families, so they serve a valuable function in welcoming and orienting visitors. The new Northern Arizona University gateway and signage elements establish a sense of quality and set an inviting, warm tone for the campus.



At the north end of the campus, the Milton/Butler corner has identity signage which acts as a symbolic gateway with views into the campus historic district. Although it is not possible to enter the campus at this location, this prominent corner announces the University to Flagstaff visitors. At the southern end of the campus, the McConnell Drive gateway is the primary entrance to the campus from the interstate. The 2006 Wayfinding Plan recommended improvement of this gateway with stone entry walls and pylons, additional signage and landscaping. Visitors to the campus, including students and families touring or attending orientation, are directed through this gateway. While University Drive is well identified, the Riordan Drive entrance also provides access to many public functions on campus, including the University Union and the Knoles Drive parking garage, and should be enhanced for wayfinding, improved function and carrying capacity. Entrances on the north and east sides of the campus, while less public, would also benefit from similar improvements to enhance campus identity.

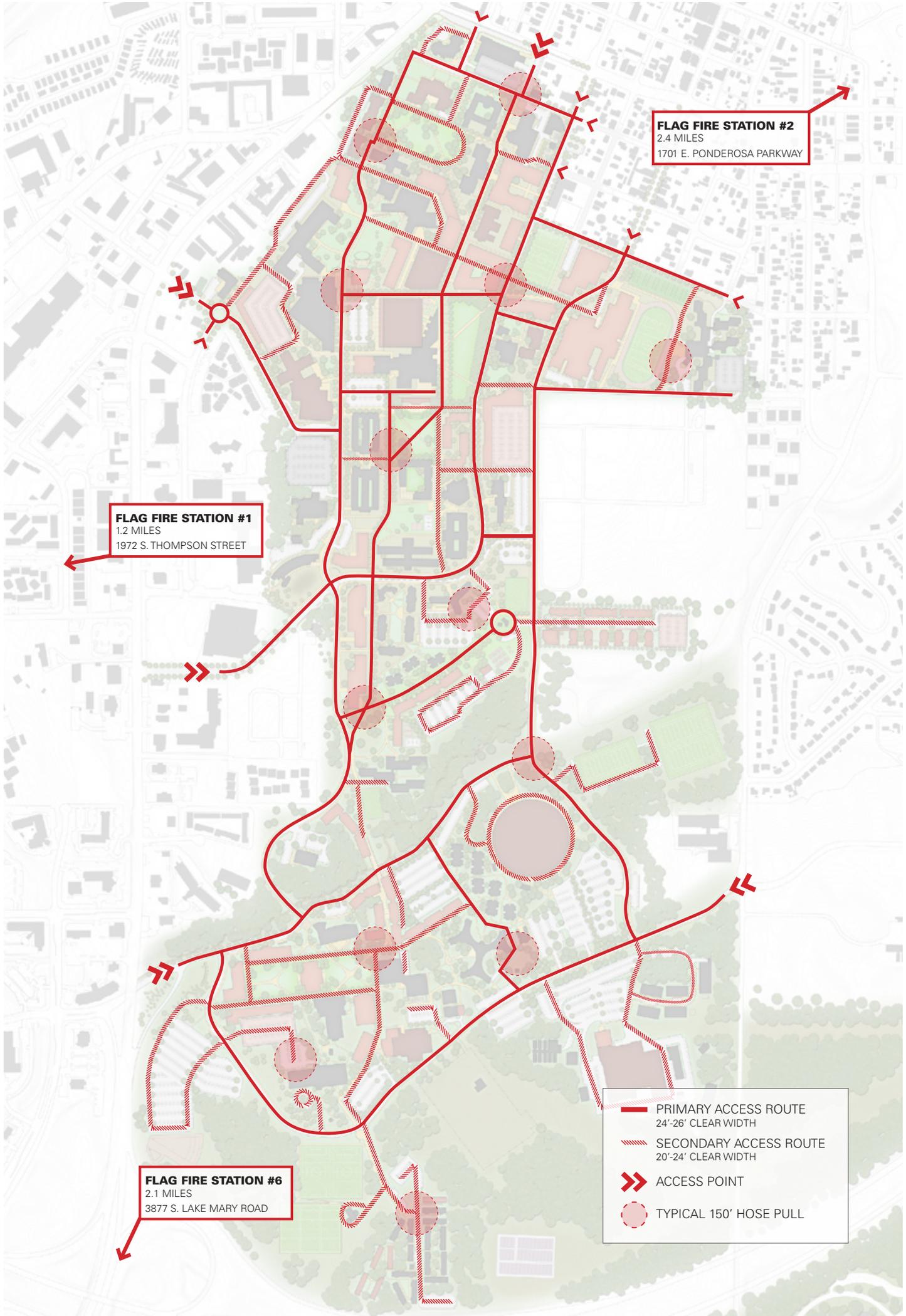


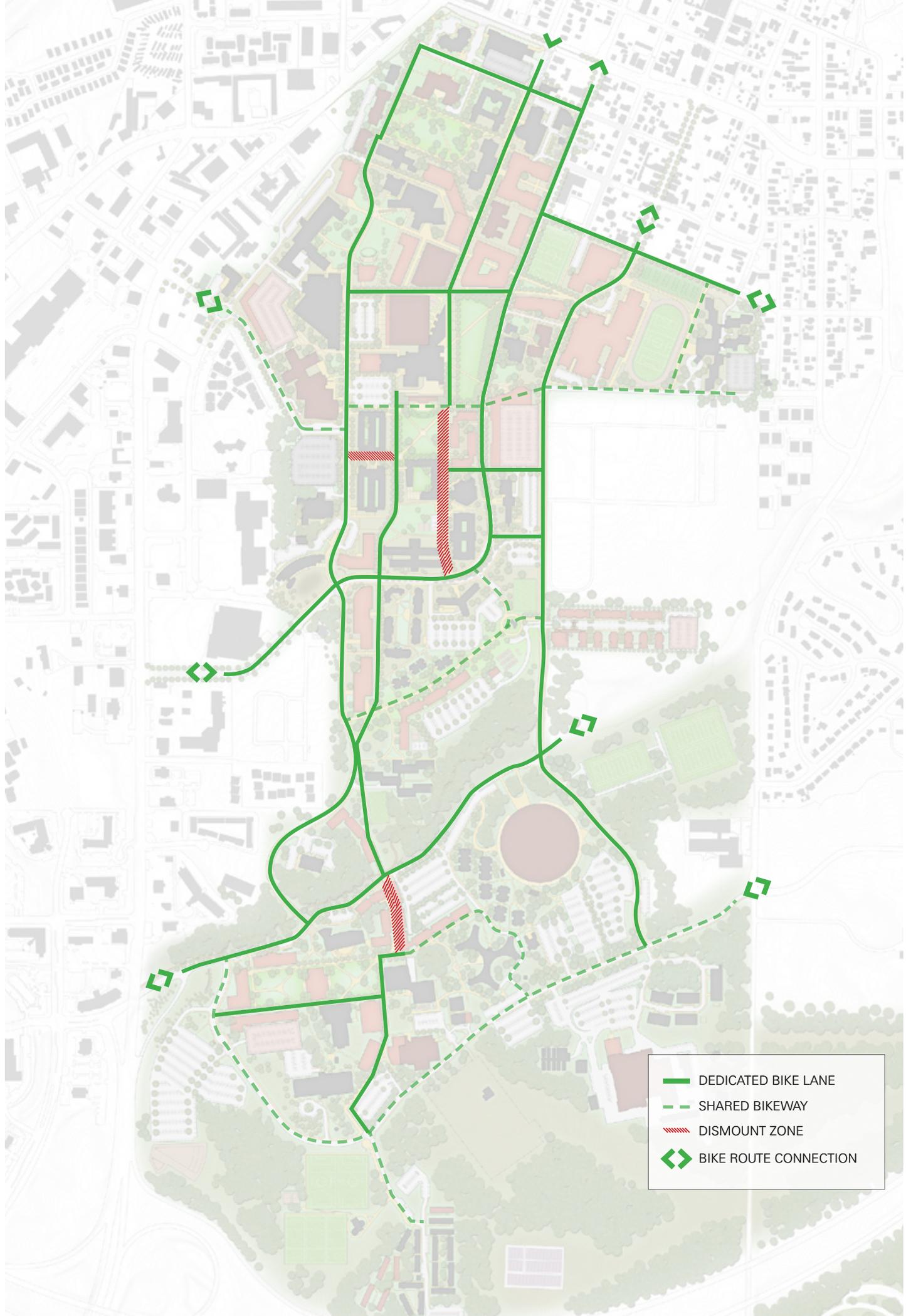
As a critical element in the circulation system, each of these entrances to the campus have been improved with vehicle 'pullouts' with parking permit kiosks and a campus map. Additional entrance signage and landscaping, including screening of adjacent uses (parking, loading docks, etc.) would improve the visibility and raise the quality of these pullouts.

EDGES & STREETS

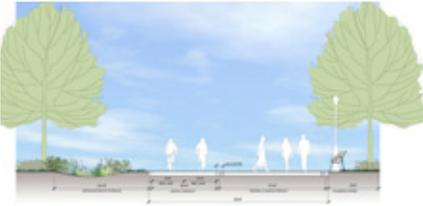
Streets are one of the most under appreciated elements of public space within the civic and campus environment. One of the most distinguishing characteristics of nearly every beloved and iconic university campus is the sense of the edge where the car dominated college town streets meet the campus with it's broad open spaces and pedestrian walks. The Flagstaff campus has these edge qualities at the northern end of the campus. A few downtown streets continue into the campus making circulation relatively straightforward. But turning off the streets, driveways wind through asphalt parking lots and circulation is less clear. To enhance the campus environment, parking should be moved into new perimeter parking garages and these driveways should be replaced by pedestrian walks and landscaping. On the other three sides of the campus the edge is less defined, with more open space and only a few streets continuing into the campus. This makes the circulation clear and simple but also results in congestion at key intersections and increased auto and pedestrian conflicts.



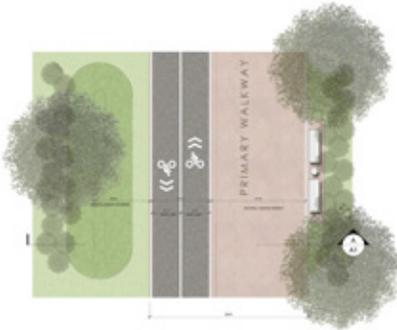




- DEDICATED BIKE LANE
- - - SHARED BIKEWAY
- ▨ DISMOUNT ZONE
- ◊ BIKE ROUTE CONNECTION



PEDWAY - SECTION



PEDWAY - PLAN

The master plan identified the pedway as the primary organizing element of the campus, which should be improved, strengthened and reinforced. As the primary pedestrian and cyclist connector the pedway should be celebrated as the central movement corridor and be extended from the northern edge to the southern tip of the campus.

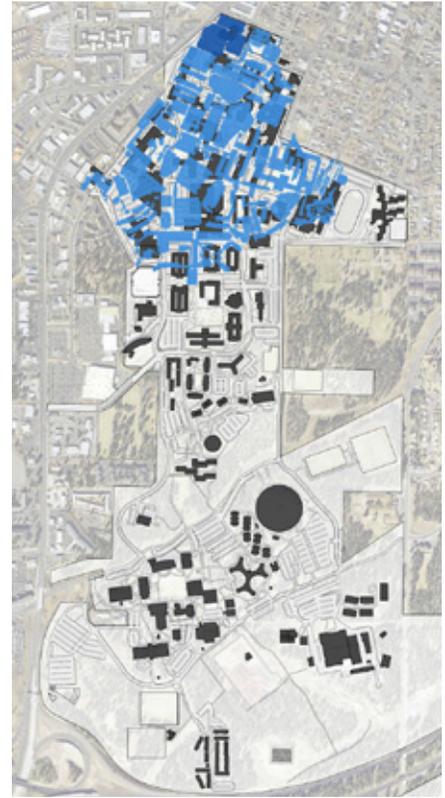
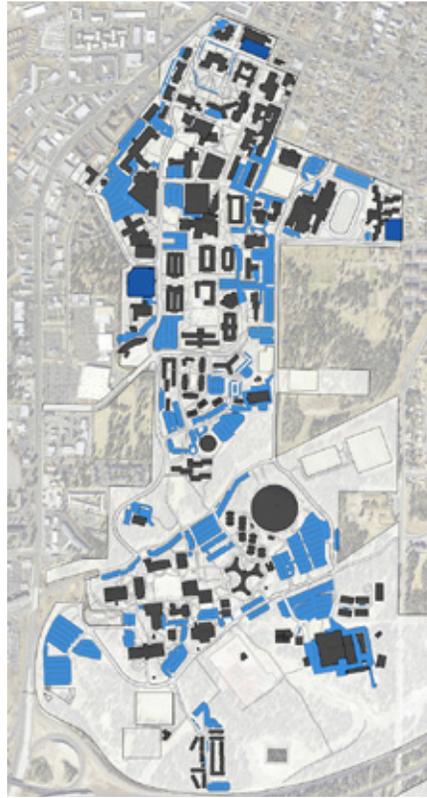
Pedestrian & Bicycle Circulation

The 'pedway' is one of the most distinguishable features of the Northern Arizona University Flagstaff campus. This central north-south pathway orients you to the mountain with amazing views of the San Francisco Peaks, and as the central artery of the campus it is active year round. Walking this path, it was striking how changes in the quality of the path (materials, width, etc.) and the adjacent activity or the lack of activity changed the perception of travel time, distance and ease. In front of the University Union where the path goes by café windows and there is the buzz of activity, students walk three abreast chatting as they walk between classes. But as the pedway moves through mid-campus, past housing buildings with no pedway level entrances and then heads down through the trees toward south campus, the walk turns into an arduous hike. Uphill both ways, students put their heads down as they climb the hill hurrying to get to the next academic building before class starts. It was clear that reducing the grade changes would only be part of a potential solution; the pedway also needs to be an interesting journey with adjacent active uses to create interest and make the walk seem shorter. At the north edge of the campus the pedway is just east of the north quad, bypassing the campus historic district. The lack of a more direct link to the pedway may be one of the reasons this corner of the campus, despite the tree-filled quad that is a favorite of alumni, feels disconnected. A stronger link to the pedway could knit this area back into the active core of the campus. Through most of the north campus core the pedway includes a paved walkway and a two-way asphalt bicycle path. In this area much of the pedway is located above, or adjacent to, the utility tunnel network. While this alignment allows for venting and access to utilities, it also presents challenges with manholes and access. Pavement settling has been a problem in some areas, with cracking and paver breakage and loss. The tunnels will need structural reinforcement if the pedway is improved to serve as an access route for service and emergency vehicles. In the mid-campus a former street was closed and striped into lanes for pedestrians and bicycles; this section could benefit enormously from improvements. As the pedway traverses the south campus, it becomes much less well defined, eventually leaving pedestrians to find their own way south across streets and parking lots to the athletic fields and family housing.

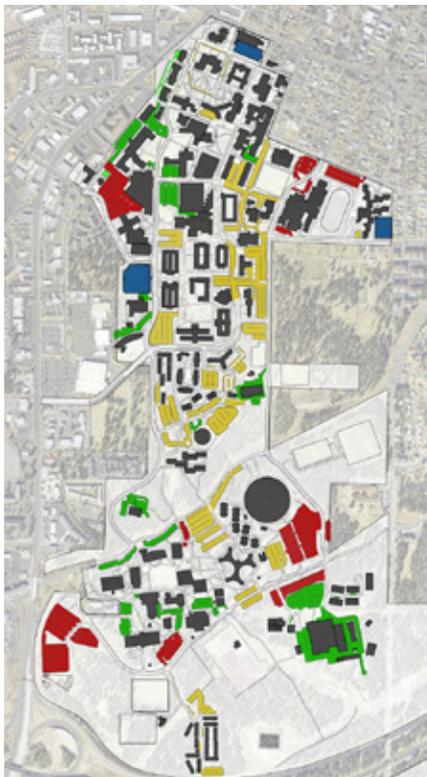
The bicycle is the most efficient way to travel on campus, and the university supports this sustainable means of transportation with a 'yellow bike' program. The central pedway is the only dedicated bike route through campus, but it does not connect directly with existing city bikeways or the regional Flagstaff Urban Trail System. Many of the campus roadways have striped bike lanes, but again these stop and start erratically, and in some areas on-street parking seems to have usurped the bike lanes. The lack of connectivity creates confusion with wayfinding and potentially dangerous bike-pedestrian conflicts as bikes race across sidewalks, plazas and parking lots looking for the bike lane. Safety and continuity of the bike routes will be critical to encouraging cycling as an alternative to cars on campus.



Parking analysis demonstrated how much of the campus land area is dedicated to surface parking -- when aggregated it's almost equal to the area of the entire north core.



The new parking permit system has begun limiting parking to specific lots (color coded at right) which has reduced the number of cars circulating in search of a better parking space. Parking demand and management best practices should continue to be implemented to enhance campus capacity to accommodate continued growth and development.



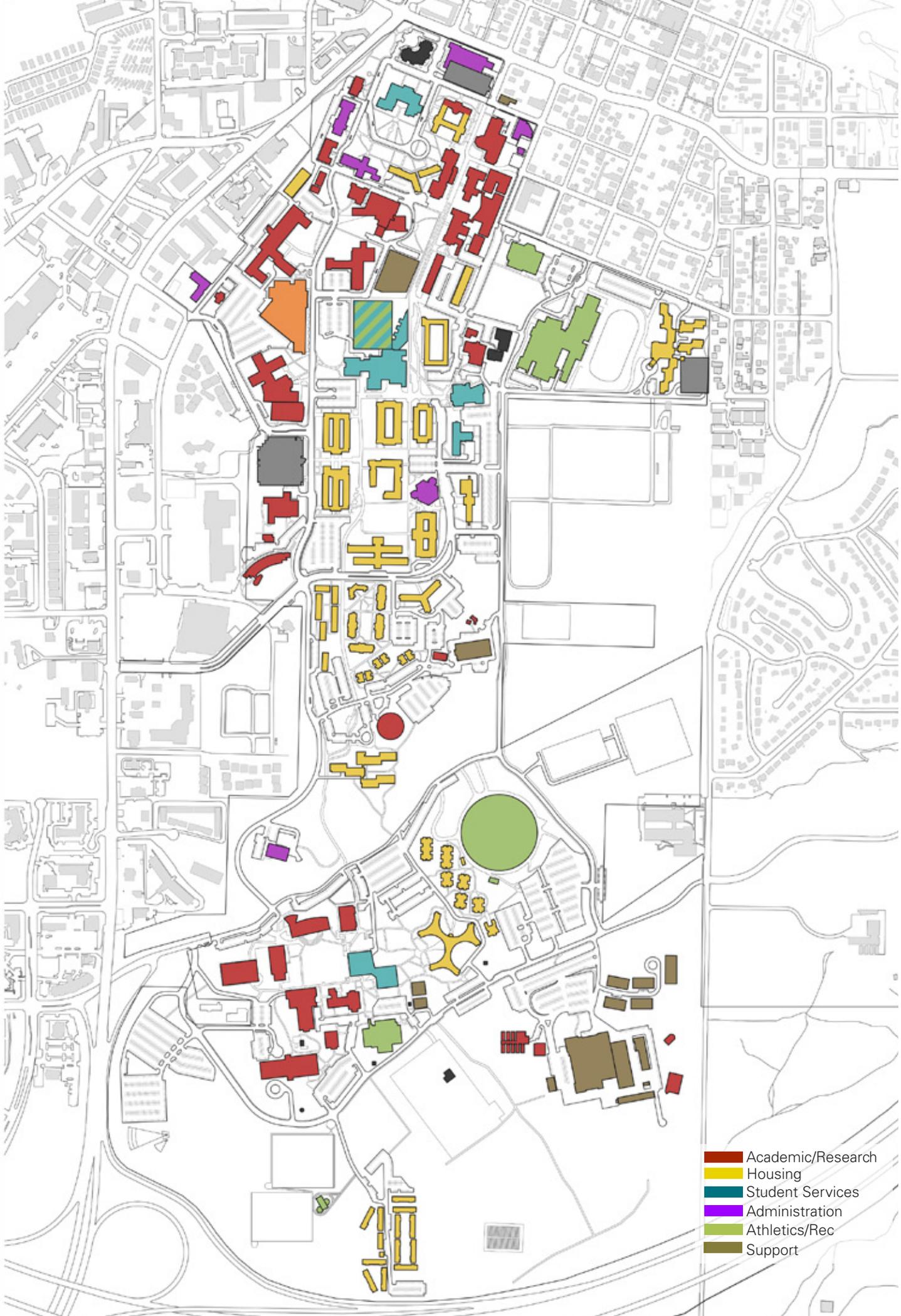


Parking

Parking analysis identified 75 acres of existing parking lots, roughly equivalent to the area of the entire north campus core. Campus growth projections could expand the area needed for parking to more than 95 acres. Nearly 90% of the 8,300 on-campus parking spaces are in surface lots. This is a significant dedication of land, the primary campus resource, to storing cars. On the north campus, smaller surface lots wind through the core areas, where demand for parking is highest. But the majority of parking spaces are in the southern perimeter lots. The result has been additional traffic winding through the north core, in search of a better parking place before eventually ending up in the south campus lots. This hunt for parking combined with the limited campus entry/exits and the street network complicates the challenge of efficiently moving thousands of students and faculty between the north and south campus cores. At mid-day class change the result was grid-lock with campus busses stuck in traffic.

The 2008 Transportation Study included recommendations for strategies to eliminate the hunt for parking, to reduce parking demand campus-wide and to consolidate parking, as much as possible, at the campus perimeter. Implementation included construction of the Knoles Drive garage; conversion of smaller surface parking lots to landscaped open space; and an improved parking permit program limiting permit holders to specific lots. These permits eliminated cars circling the north core lots for a more favorable space; and now fewer students use their cars to travel between the campuses at class changes. In turn the reduced traffic jams have improved the efficiency of campus bus service and ridership is growing.

Increasing the parking permit fee reduced demand for permits, but some students sought parking off campus, creating problems for the adjacent businesses and neighborhoods. Policies will be needed to effectively manage on-campus parking, discourage parking on private property off-campus, and encourage transit or bicycles as an alternative. A graduated permit price could act as an incentive for students to choose a less expensive remote parking lot rather than risk a parking ticket off-campus. Reliable and efficient campus bus service will make those choices workable. Recommendations for structured parking at the perimeter of the campus have been included in the master plan, with sites for three major garages located. Removing parking from the campus core opens up new building sites and creates a safer and more enjoyable campus pedestrian experience. Structured parking, while significantly more expensive, is a more efficient use of land and ultimately the best way to provide parking in close proximity to major campus event venues (theater, library, University Union and sports venues). Where possible, parking structures should be combined with complimentary street level uses to improve efficiency and mitigate impact on the campus pedestrian experience.

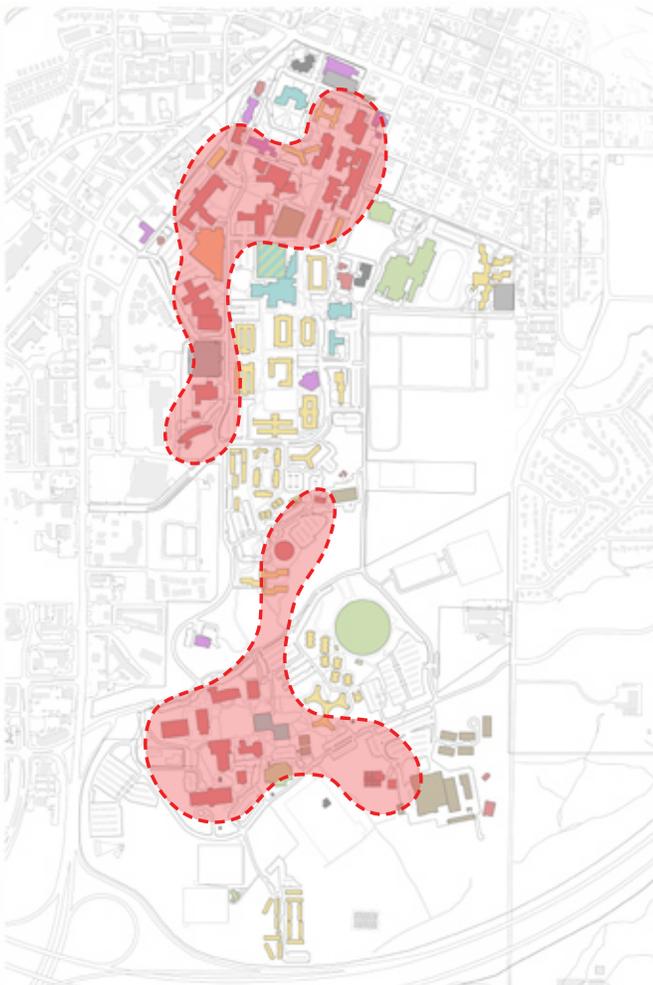


- Academic/Research
- Housing
- Student Services
- Administration
- Athletics/Rec
- Support

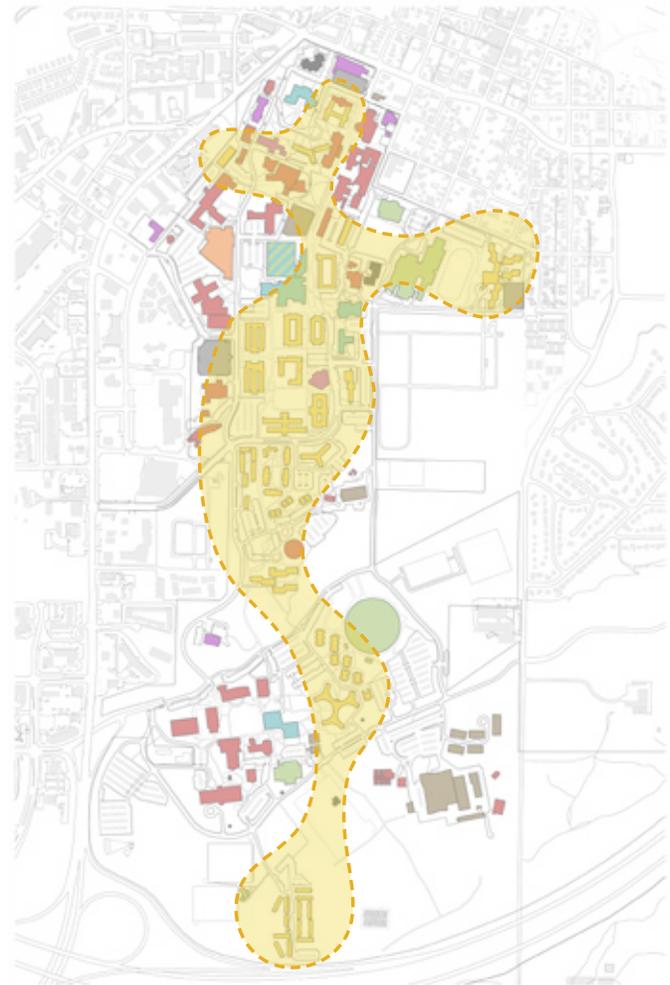
LAND USE

Most traditional campuses have a central academic core surrounded by housing or recreation precincts. But the Flagstaff site was developed as two independent academic campuses, and still struggles with the separation. More recent academic buildings have added height and density to strengthen the academic core. But several older north campus dormitory buildings have been repurposed as faculty office/classroom buildings, preserving the residential scale at the expense of efficient function. Overtime replacement buildings should concentrate density and capacity within each core.

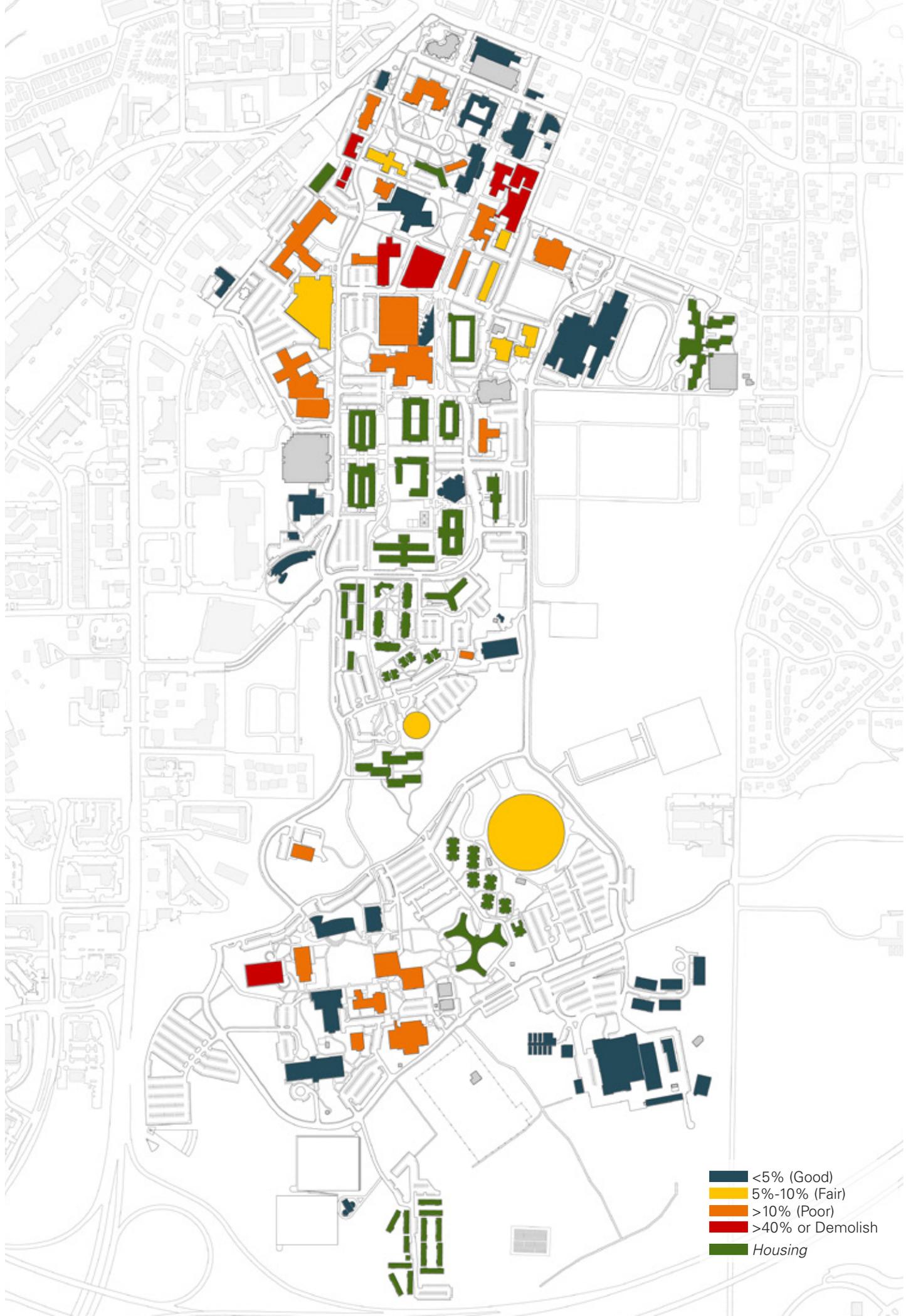
Housing is woven throughout the campus, creating a very residential feel. Student services (dining, union, etc.) and recreation are located on both the north and south campuses in close proximity. Much needed housing should be sited to enhance campus connectivity, and where possible active uses (dining, service and retail and classroom space) should be included at the pedway or street level.



Academic land use analysis



Residential land use analysis



- <5% (Good)
- 5%-10% (Fair)
- >10% (Poor)
- >40% or Demolish
- Housing



The Facilities Conditions map illustrates building conditions for all buildings on campus, except housing. The Residence Life department maintains student housing with housing fees and has little to no deferred maintenance. All housing buildings are in fair or good condition, although some older buildings may have other operational or functional inefficiencies.

The facilities condition index (FCI) is a ratio of the estimated deferred maintenance* to the estimated building replacement value. A desirable FCI goal is 0.02 (20% = cost of deferred maintenance/ building replacement value).

- Good Condition = FCI < 0.05
- Fair Condition = FCI 0.5 - 0.10
- Poor Condition = FCI > 0.10
- FCI greater than 0.15 is an indication of facilities at risk for failure or non-functionality, if significant renovation or replacement does not occur soon. Buildings with an FCI greater than 0.40 are costly to renovate, where possible - demolition is recommended.

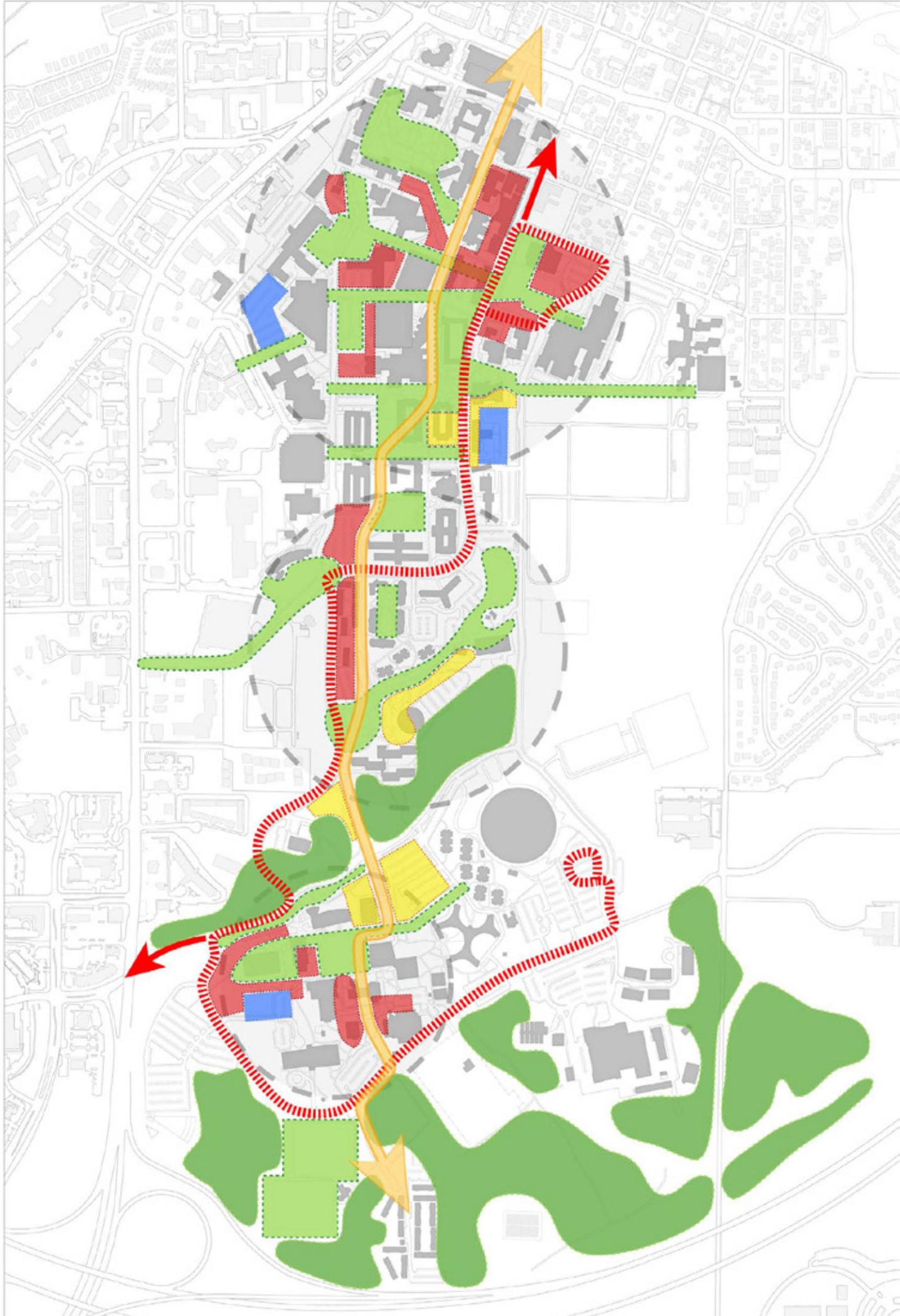
**Deferred maintenance does not include routine maintenance needs, although failure to adequately fund routine maintenance eventually will add to the deferred maintenance backlog. NAU continues to focus on the most critical deferred maintenance situations in all facilities whose failure would result in disruption of university services.*

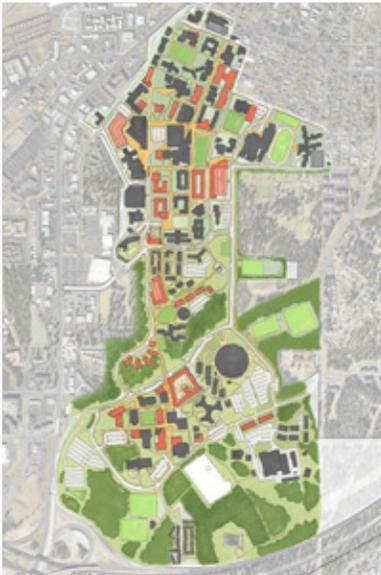
FACILITIES CONDITIONS & PROJECTED NEEDS

The condition of existing facilities is a significant consideration in the master planning process. Northern Arizona University continues to use the physical audit and documentation process adopted by the tri-university system in 1998, but with the changes in procedures identified in ABOR reviews. This process of internal and external reviews of all buildings results in improved estimates of the overall building condition, and better identification of required maintenance work. Project cost estimates are developed for each deferred maintenance situation, and compared with cost data from on-going facility projects. MacTec Engineering and Consulting, Inc. was retained to conduct physical inspections of 25 buildings as part of NAU efforts to inspect one quarter of campus facilities annually. The firm provided 5 year schedules for projected maintenance needs for building systems, including roofing. Facility condition deficiencies were identified through physical inspections where deterioration and/or life safety concerns, which could affect the proper functioning of the facility, were evident. Typical building components with deficiencies include: heating, ventilation and air conditioning, roofs, flooring, walls, ceiling and lighting, electrical and plumbing. Lack of funding for maintenance impacts building functionality, equipment replacement schedules and operational cost, producing a backlog of deferred maintenance projects which negatively impacts the quality of campus facilities. Funding requests are submitted every two years in the Capital Improvement Plan to address deferred maintenance and building renewal through a combination of planned renovations and new construction (replacement including demolition).

The Flagstaff campus has over 78 buildings with almost 3.5 million gross square feet (gsf) in existing academic and support facilities (not including housing). Of that total, almost 500,000 gsf are in buildings with an FCI greater than 40, which would be cost prohibitive to renovate and where replacement has been recommended. Another 200,000 gsf are in poor condition and should be considered for extensive renovation or eventual demolition. The master plan has to provide for the replacement of these buildings with more efficient and effective facilities which will serve the campus far into the future.

Projections for the growth of the Flagstaff campus have been raised to 25,000 students to meet the Vision 2020 goals set by the Arizona Board of Regents. To achieve this goal, student growth is projected for five and ten years and space needs are then projected accordingly. The team looked at academic and research space; administrative and student support space; and athletics and recreation space. The results suggested a projected need for 4.36 million gsf which would require over 1.1 million of added new space, in addition to almost 600,000 gsf of space to replace buildings scheduled for demolition. These projections also identified the need for an additional 4000 beds in new student housing, in addition replacement of beds lost to building removals.





Three alternatives for development

CONCEPT PLAN

Underlying all campus master plans are broader concepts, like strands weaving the fabric of the campus together, which create the conceptual framework upon which the more detailed master plan is developed. The Observations workshop established the context, defined the guiding principles, and described a vision for the future. The Concepts workshop focused on identifying these underlying strands and developing a broad strokes approach, like a sketch before a painting, to developing the master plan.

The Concepts workshop also allowed the planning team to test alternatives for how to develop the campus to meet projected needs. This workshop built on the analysis of existing land uses, building condition and space needs, suggested various strategies for future campus growth and development. Three alternatives were developed for evaluation. All three maintained common elements, including the restoration of the historic north quad, the implementation of the first phase of the transit spine, previously planned perimeter parking structures, and the proposed pedway bridge to connect to the south campus housing project. But the alternatives allowed for exploration of options for replacement or renovation of buildings in the poor condition, sparking discussion about priorities and the challenge of repurposing older buildings. Three concepts were explored with different strategies to accommodate growth: retain and reuse existing buildings of all types; focus on replacing aging academic facilities ; or focus on replacing aging housing facilities while renovating academic buildings. From the evaluation of each alternative, a single conceptual plan was crafted using concepts and elements from all three alternatives.

CONCEPT DIAGRAMS



Connect north, mid and south campus with a strengthened central pedestrian spine



Interweave the transit spine and relocate parking to perimeter structures



Create memorable open spaces and east-west connections to pedestrian and transit spines



Reinforce the academic core with new buildings, and infill with student housing



Concept synthesis

ORGANIZING CONCEPTS

Observation and analysis of the existing campus identified a set of organizing elements to unify the campus. These elements set a framework for the concept plan and exploration of planning alternatives. These organizing concepts and elements are integral to the final campus plan.

UNIFY THE CAMPUS WITH PEDESTRIAN WAY

Enhanced design of the central pathway for pedestrians and bikes provides connectivity through the campus. This plan extends the pedway over a new pedestrian bridge spanning Sinclair Wash and McConnell Drive. The bridge is integrated into the design of new student housing reducing travel time and distance.

INTERWEAVE A BUSWAY

The new transit spine will parallel the pedway, weaving transit into the campus pedestrian network.

CREATE MEMORABLE OPEN SPACES

The plan includes restoration of the north historic district quadrangle and creation of a central university green and gathering space surrounding the University Union. Planned east-west pedestrian and bicycle path improvements connect the pedway and transit spine.

RELOCATE PARKING

Three major parking garages close to campus gateways will shift parking from the core to the perimeter, creating new building sites and open spaces.

REINFORCE THE ACADEMIC CORE

Significant new academic buildings replace obsolete facilities, link north to south and cluster disciplines: the north sciences corridor with laboratory, classroom and office buildings; mid-campus with academic and research buildings along the pedway; and new buildings for health professions and social and behavioral sciences around the south campus bowl.

INFILL WITH STUDENT HOUSING

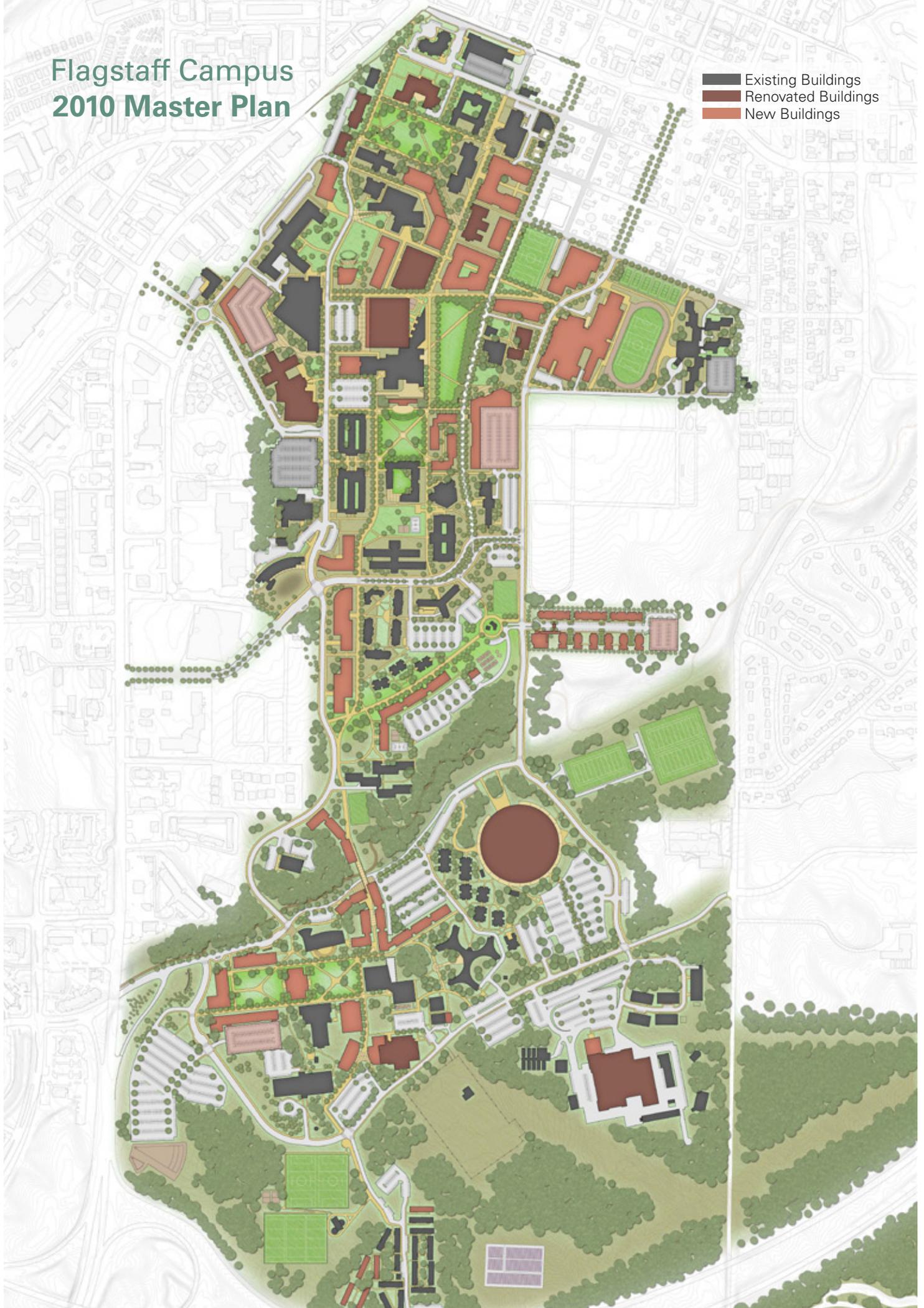
Enliven the campus with new student life facilities including: housing with active uses along a new pedway bridge over McConnell Drive; new mid-campus housing; and new central campus green spaces to integrate academics and student life.

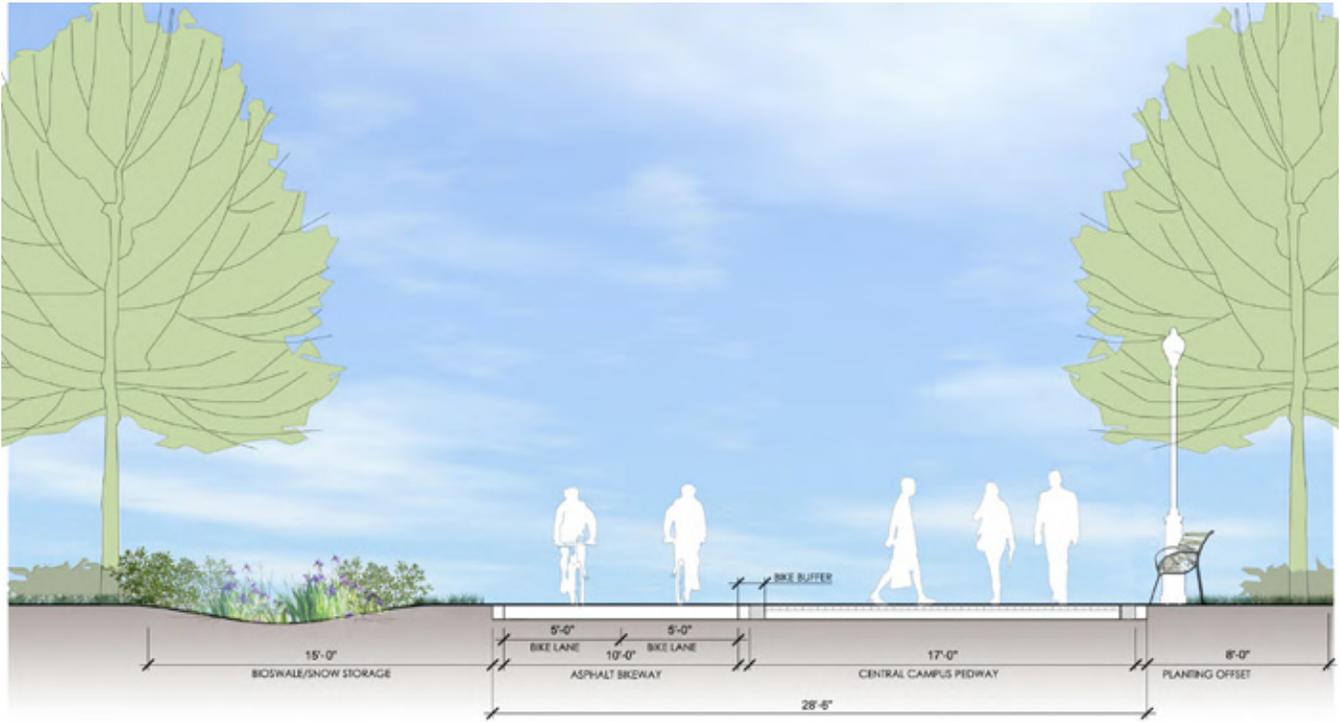
CELEBRATE SUSTAINABILITY

Environmental stewardship should be supported with improvements for walking, bicycling and transit, with an emphasis on native landscapes and storm water management, and with increased campus housing and density.

Flagstaff Campus 2010 Master Plan

- Existing Buildings
- Renovated Buildings
- New Buildings





UNIFY THE CAMPUS WITH PEDWAY



The master plan seeks to unify the campus by reinforcing the pedway as the central organizing thread through the campus as well as the primary north-south circulation route. Pedway improvements (paving, lane designations, signage, lighting, snow storage and drainage, etc.) are recommended to enhance both pedestrian and bicycle use while increasing safety. These improvements should extend to the edges of the campus, north and south, and use of more consistent materials (especially paving) will make it easier to follow the pedway route as it winds through busier areas of the campus. Paralleling the pedway through the north core of the campus, is the new transit spine, a dedicated busway. Enhancing east-west pedway connections will be critical to helping students use the bus system to make time-sensitive connections between the north and south academic cores.





Site proposed for NACC.

The plan proposes concentrating new active uses along the pedway. Enlivening the pedway with student activity reinforces the pedway as the primary pedestrian thread through the campus. Activity also makes the walk more interesting so the travel distance is perceived as shorter and the walk more appealing as a circulation option.

On the north campus, the plan proposes new academic buildings to be located along the pedway. Critical to meeting the campus's growing needs, the sciences core is planned to be reinforced with a new, phased lab building which is the first step in a plan to replace the oldest science buildings which have outlived their useful lives. The first phase is the new Science & Health building to be located immediately south of the existing Sciences Lab building. The site faces the pedway at the intersection where a new connection to the north quad will be created.



To make this pedway site available, a new and previously unavailable site was identified for the Native American Cultural Center. The existing counseling center which is quite small and inefficient will be demolished to make way for the Cultural Center. The counselors are being relocated into the new Health and Wellness building when it opens. This new location faces the Cline Library and the University Union, and offers improved public access, better parking and an unparalleled view of the mountains. The Center is expected to open by Spring 2012.



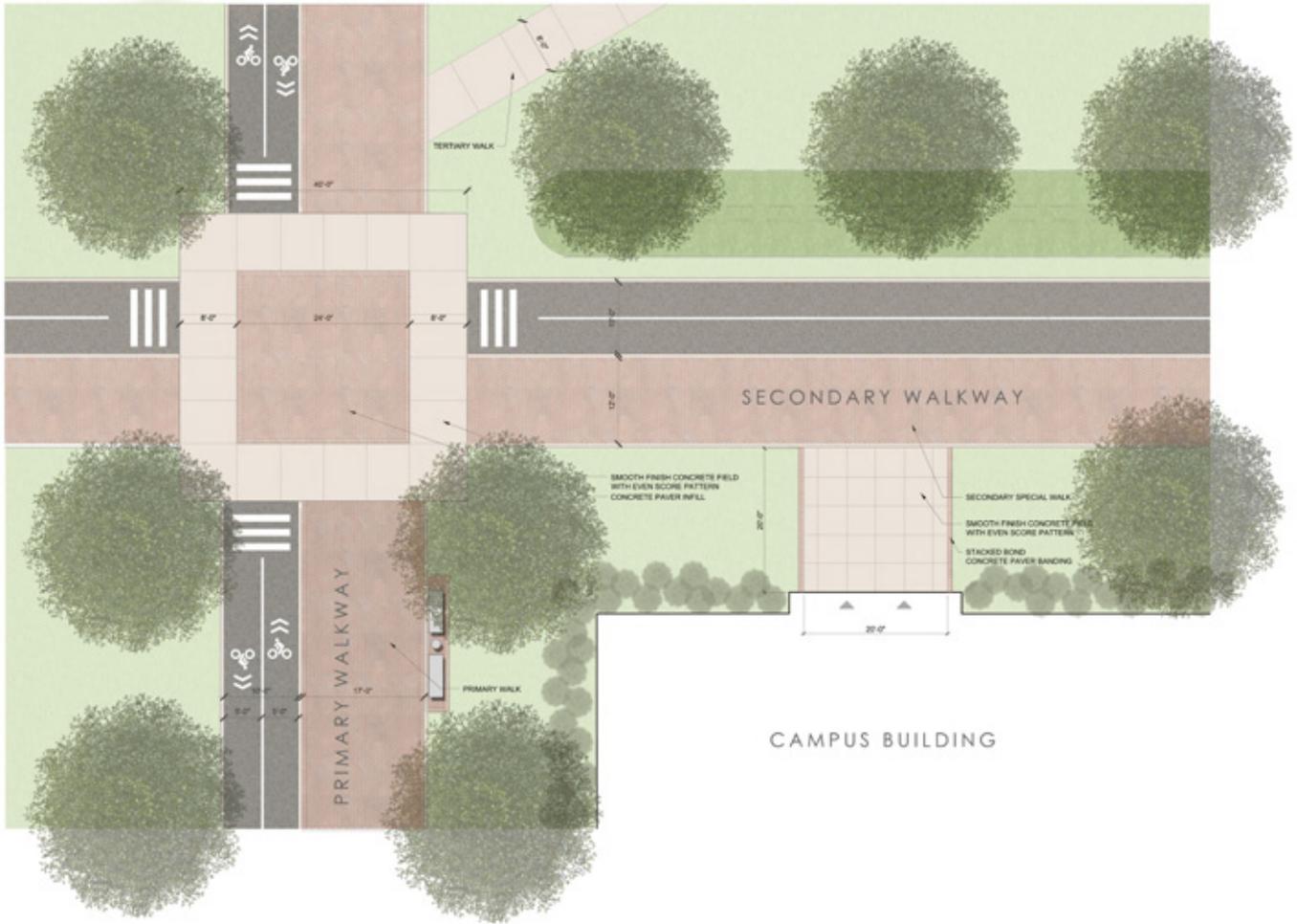
North campus pedway

At the University Drive entrance to the campus, a new Admissions & Administration building is proposed along the pedway, replacing the relatively isolated Babbitt Administrative Center. After crossing University Drive heading south, the pedway is on a closed former street, which is functional but still feels more like a street than a dedicated walkway. Collapsible bollards are used to allow service and fire vehicle access while still restricting car traffic. Pedway improvements should accommodate service and emergency vehicles, but improved design should make the bollards unnecessary. New research and academic buildings are proposed to line the west edge of this improved pedway. The master plan also recommends shifting the route slightly west to avoid an existing rock outcropping, eliminating 10 feet of vertical climb each way.

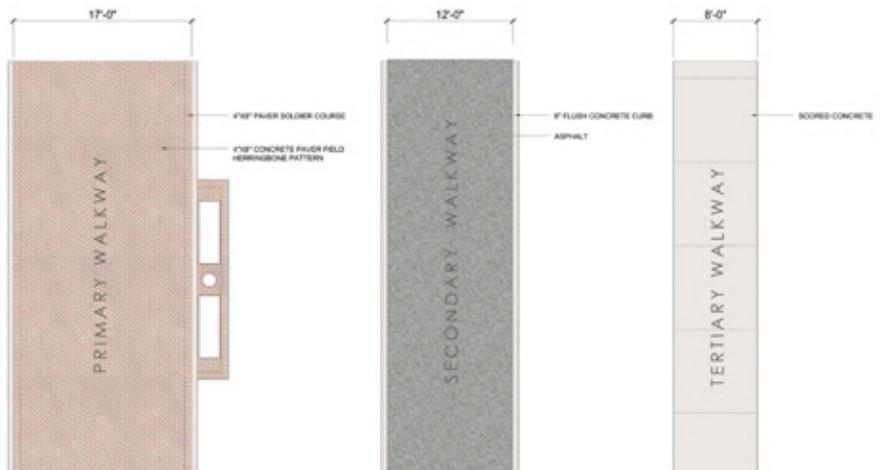


Mid-campus pedway

MASTER PLAN



The master plan identified the pedway as the primary organizing element of the campus, which should be improved, strengthened, and reinforced. As the primary pedestrian and cyclist connector the pedway should be celebrated as the central movement corridor and be extended from the northern edge to the southern tip of the campus.





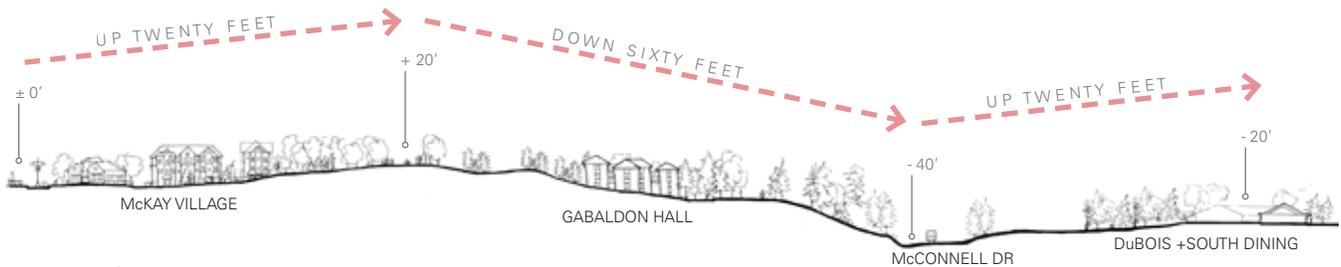
Pedway crossing Sinclair Wash and climbing uphill from the south.



Sinclair Wash with Knoles Dr. and pedway crossings in the distance.

The most challenging portion of the pedway is the connection from mid-campus south, where the path traverses the challenging topography. The rise across the mid-campus is fairly gradual, but still rises over 20 vertical feet before dropping more than 60 feet vertical feet through the trees to cross Sinclair Wash. The rustic bridge over the wash includes several steps for pedestrians while cyclists are diverted onto an adjacent trail. After crossing McConnell Drive, the pedway climbs back up about 20 vertical feet to reach the core of the south campus. Although this is one of the most picturesque pedway sections, many students avoid the hike.

To reduce the perceived distance and actual travel time between the campus cores, the planning team proposed a new pedestrian bridge to carry the pedway over the Sinclair Wash and McConnell Drive. This bridge would connect the mid-campus pedway just south of Gabaldon Hall with the pedway in front of DuBoise dining and the south campus quad. This wide sloping bridge would shorten the route and dramatically reduce travel time. The new bridge is proposed to be integrated into the design of new student housing planned to open in Fall 2012. This approach will reduce the cost of the bridge, with only the center portion acting as a bridge to span the street and the wash.

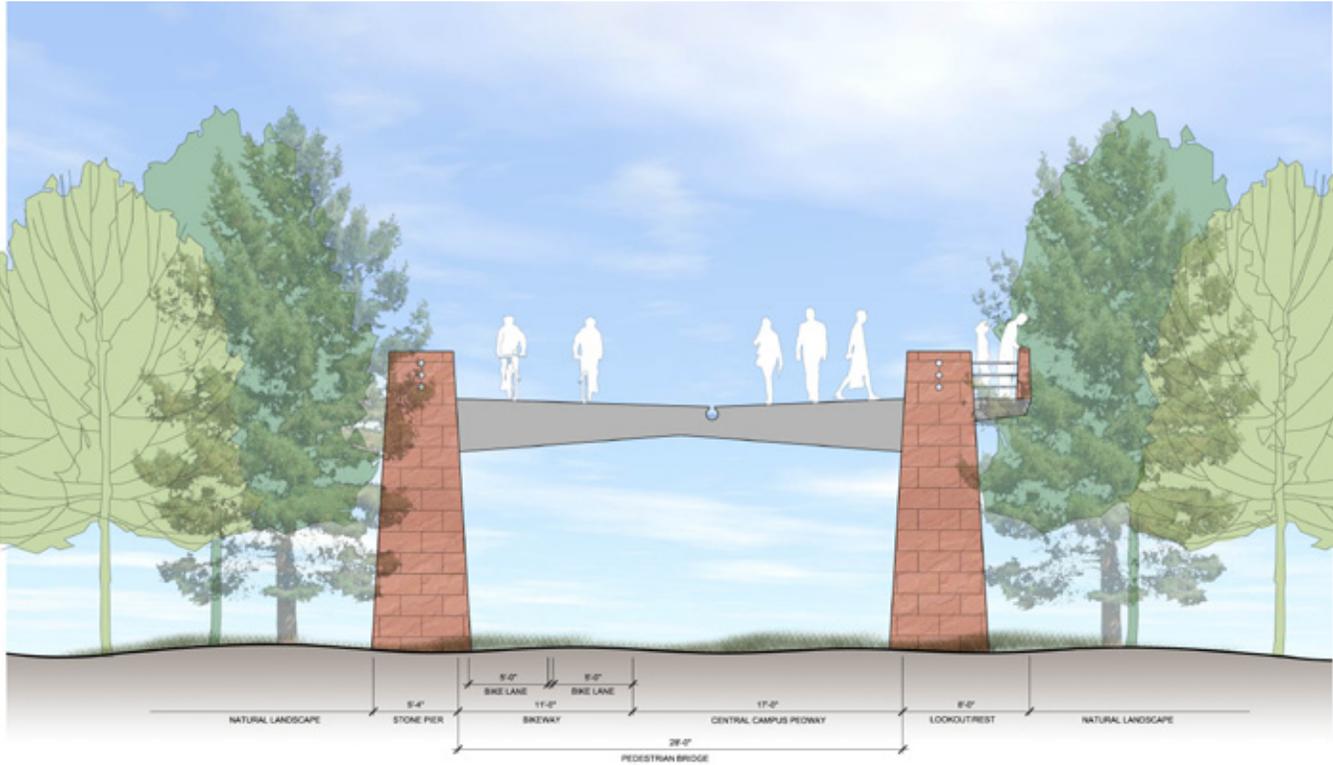


Existing pedway section



Proposed pedway section with the bridge

Analysis confirmed that it's uphill both ways between the south campus and mid or north campus. Traversing the steep topography increases the perceived distance and actual travel time. The proposed pedestrian bridge will significantly reduce travel distance, time and difficulty improving connections between north and south.



Pedestrian Bridge - Section

SOUTH CAMPUS HOUSING AND BRIDGE

Strengthening the central pedway is the lynch-pin to unifying the campus, so one of the most significant proposals in this plan is a new pedestrian bridge extending the pedway over Sinclair Wash and McConnell Drive to connect to the south campus. The bridge replaces existing steep sloping paths with a gradual slope from new housing to the existing pedway in front of Gabaldon Hall. The bridge is proposed to be built as part of the south campus housing project, with the adjacent housing activating the pedway and improving safety. The gently sloping bridge would be wide enough to safely accommodate a two-way bike path as well as the pedestrian path. The bridge should be designed to handle snow and storm water efficiently, with materials that reflect the new standards for campus gateways and signage elements. The new housing building should include active uses along the pedway, such as entry lobbies, classrooms, activity areas, food and retail or other amenities. Future phases of the master plan call for additional housing on both the north and south ends of the bridge to further improve and enliven the pedway.

In total, the proposed pedway improvements, including quality paving and landscaping, enlivening the walk with active uses, and the pedestrian bridge, will dramatically change the experience of walking and biking through the campus.

SOUTH CAMPUS HOUSING AND BRIDGE

The bridge is proposed to be integrated into the design of new student housing planned to open in 2012. The new building should include active uses along the pedway, such as entry lobbies, classrooms, activity areas, food and retail or other amenities. Future phases of the master plan call for additional housing on both the north and south ends of the bridge to further improve and enliven the pedway.



Existing pedway from the south campus



Future pedestrian bridge viewed from the south campus housing

MCCONNELL DRIVE & PEDESTRIAN BRIDGE

McConnell Drive is the primary gateway welcoming visitors to the campus. The plan reinforces this campus entry with new academic buildings replacing older, substandard buildings. Looking past the W.A. Franke College of Business, is the proposed South Campus Housing which includes a new pedestrian bridge. The bridge carries the pedway over the Sinclair Wash and McConnell Drive to unify the campus.



Existing McConnell Drive



Future Pedestrian Bridge over McConnell Drive

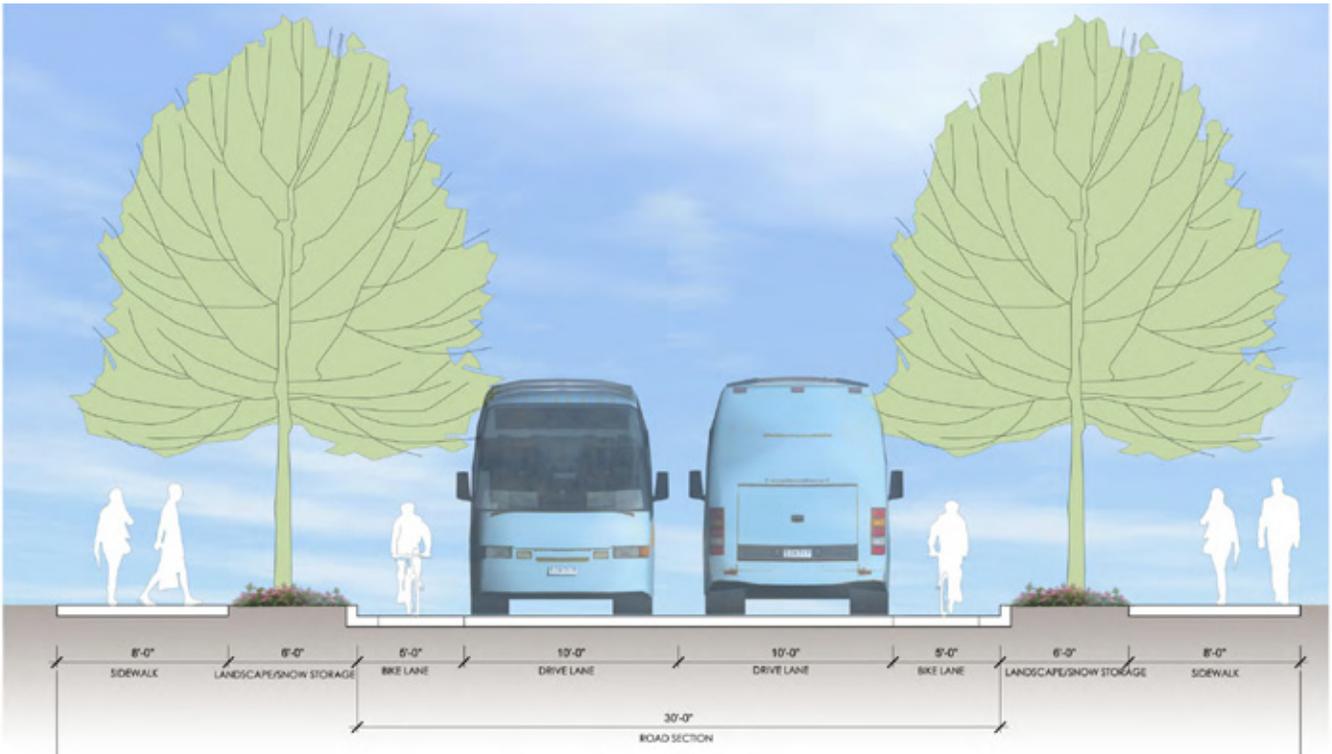
TRANSIT SPINE

This new right-of-way through the busiest section of the north campus is dedicated to transit for campus buses and a new regional bus route. Spine improvements include bike lanes, wider sidewalks and crosswalks, bus shelters, signage, lighting, and street trees.

Bus Facts:

- Campus Transit System currently moves over 4000 people per day
- City of Flagstaff Transit Systems only moves 3,000 people per day

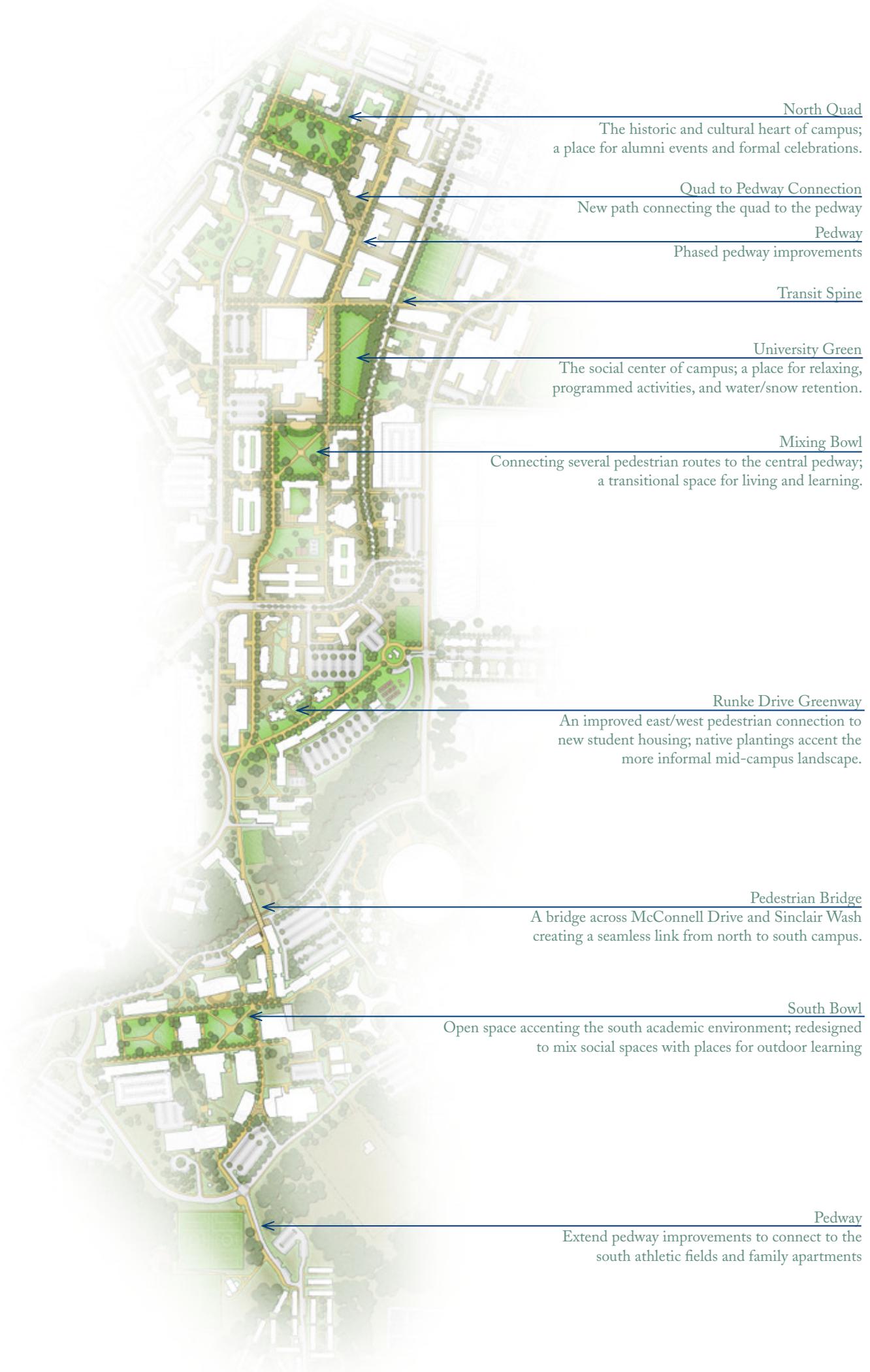




INTERWEAVE A BUSWAY



The new transit spine, a dedicated busway, will parallel the pedway, weaving transit into the campus pedestrian network. Transit was a key element of the 2008 Transportation Study, which evaluated various approaches to identify a north-south route through the campus which would accommodate busses, pedestrians, bicycles and auto traffic on independent routes. The first phase of implementation will establish a transit route and new regional bus line, in partnership with Northern Arizona Inter-governmental Public Transportation Authority (NAIPTA) and the City of Flagstaff. It is hoped that this route will better connect the campus transit system with City and regional busses, making transit a viable alternative to bringing a car on campus. The first phase of implementation was the proposed transit spine, a dedicated busway through the north campus core. The dedicated transit spine starts at the north edge of campus at Franklin and Beaver Street, and continues south through former parking lots to connect to University Drive. Busses rejoin auto traffic on University and continue south on Knoles Drive. The NAIPTA bus will exit the campus headed west on McConnell, while campus busses will loop through the south campus before returning north on Knoles. The transit spine is being designed to accommodate busses, cyclists and pedestrians and safety is a major focus of the design. The route will be lined with sidewalks, landscaping, street lighting and trees. The master planning team provided input on the spine alignment and details of the bus stops and shelters, pedestrian crossings, and connections to existing and proposed cross-campus routes. Construction is scheduled for Summer 2011.



North Quad

The historic and cultural heart of campus; a place for alumni events and formal celebrations.

Quad to Pedway Connection

New path connecting the quad to the pedway

Pedway

Phased pedway improvements

Transit Spine

University Green

The social center of campus; a place for relaxing, programmed activities, and water/snow retention.

Mixing Bowl

Connecting several pedestrian routes to the central pedway; a transitional space for living and learning.

Runke Drive Greenway

An improved east/west pedestrian connection to new student housing; native plantings accent the more informal mid-campus landscape.

Pedestrian Bridge

A bridge across McConnell Drive and Sinclair Wash creating a seamless link from north to south campus.

South Bowl

Open space accenting the south academic environment; redesigned to mix social spaces with places for outdoor learning

Pedway

Extend pedway improvements to connect to the south athletic fields and family apartments

CREATE MEMORABLE OPEN SPACES



The plan envisions memorable landscaped open spaces along the pedway, from the restoration of the north quadrangle to the new recreation fields on the southern end of the campus. These spaces are vital to campus life fostering a sense of community with formal and informal areas for social, intellectual, and recreational activities. The Northern Arizona University campus is not organized around a traditional central mall, and the more traditional quads are not located central to student activities. So the master plan removes some older inefficient buildings to create significant new open spaces around the University Union. The proposed University Green would become the central space at the heart of campus life, with the pedway defining the west edge and the transit spine along the east side. On the south side of the union, the ‘mixing bowl’ is where the pedway crosses diagonally to meet east-west pedestrian and bicycle path improvements to enhance connectivity between the pedway and the new transit spine.

Open space was the dominant theme in the Precinct Studies workshop, allowing the master planning team to study specific areas of the plan in greater detail. These studies focused on re-invigorating the existing quadrangles (north quad and south bowl) as well as creation of new spaces to enliven the campus. Each of these precincts are described, with the proposed improvements and detailed landscape recommendations. Several new spaces are illustrated with a ‘before’ photo and a perspective sketch of the proposed ‘after’ view.



Early 20th century photos of Old Main, the first building on campus. As the automobile came into wider use, portions of the quad were used for parking. Prior to the automobile, the lawn in front of Old Main supported an earlier means of transportation, as a horse pasture.



Aerial photograph from 1948 showing U-shaped configuration of the quad prior to the construction of the North Union. Buildings and plantings were oriented around the vista to the San Francisco Peaks. The trees are still young so that views of the mountains and of Old Main, were prominent from nearly every vantage point within the quad.

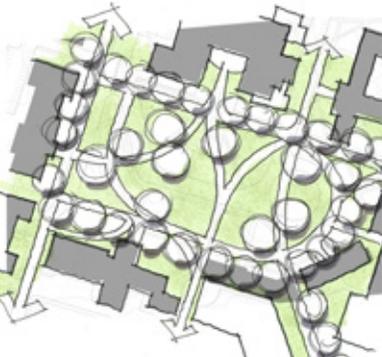


The oldest campus precinct was developed from 1899 to the 1930's around a traditional campus quadrangle. The north quad is a destination for alumni events, graduation pictures and nostalgic campus visits and is often cited as the part of the campus which most captures the essence of the university.



NORTH QUAD

At the northernmost corner of the campus the quad in front of Old Main presents the iconic image cited most often as capturing the essence of the Flagstaff campus. But on a day to day level, this area is removed from student activity. The precinct study focused on how to weave the space back into the campus, including restoration and renovation of the landscape and hardscape. Traditionally, campus quadrangles are well defined along the sides and open at the corner, activating the quad by encouraging diagonal movement through the space. To reconnect this quad with the core of the campus, this diagonal circulation should be extended through the quad with a new paved path to the pedway creating a physical and visual link. The plan recommends removal of Taylor and Bury Halls which are in poor condition, and replacement with a future addition to the Health Sciences building to be aligned with Old Main along the southern edge of the quad. This change will regularize the quadrangle plan and open the corner for the new pedway connection. Renovation of the north quad to remove parking and improve the landscaping is recommended as a first phase project.



The precinct study produced detailed landscape observations and recommendations for immediate and long term maintenance with an integrated strategy for planting future generations of trees within the quad landscape. This will ensure that there is always an interesting and valuable collection of trees at the heart of the campus. The quad should be renovated with consistent use of brownstone site masonry and unit paving which is harmonious with existing historic buildings and the quads character.



Observations:

- There is an aging tree canopy in the North Quad with no systematic plan for succession. Many of the trees are exotics that were imported to Flagstaff and are poorly adapted to the extremes of environment in both temperature and moisture availability. As a result, many of these tree specimens have fallen prey to disease and internal decay.
- Large number of deciduous trees (especially the English elms) appear to be in decline. Some appear to be dead and may present safety risks. Others have been reported to have issues with interior rot and will continue to decline.
- Views across and within the quad of the historic buildings as well as distant view of the mountains are obstructed by low branches.
- Driveways and parking lots break up the quad, giving it the feel of a large drop-off area and taking away from the sense that this is special place for the university community.
- Precast concrete site furnishings and raised concrete block planters in a variety of styles, detract from the coherence of the quad.
- Site lighting is inconsistent in light levels and quality and fixtures do not appear to meet code standards.
- In some areas the materials are deteriorating or in poor condition and should be repaired or replaced.

North Quad Landscape Recommendations:

- Remove vehicular driveways and parking. Replace with a clear hierarchy of pedestrian paths, some of which will continue to provide access for emergency and service vehicles
- Renovate landscape with consistent use of brownstone site masonry and unit paving to reinforce the historic character of the quad.
- Develop a tree preservation plan for the North Quad, including treatment programs for preserving existing significant, older trees and a strategy for renewing the tree canopy with incremental new plantings
 - o Engage a certified arborist and tree care specialist to inventory and assess the condition of the existing trees.
 - o Include a rating of health and safety as well as overall tree quality.
 - o Include recommendations for preservation, ongoing care and replacement.
- Remove dead specimens and select trees that are in poor condition and poorly adapted to conditions in Flagstaff
- Develop a strategy for planting future generations of trees within the quad landscape. This will ensure that there is always an interesting and valuable collection of trees at the heart of the campus.
- With respect to the role of the North Quad as an arboretum, the University should develop clearer, more refined curatorial and collections policies, including:
 - o Respect and care for the plant collection that is part of the historic district
 - o Look at other areas of campus for opportunities to expand this living collection and highlight sustainability and native plant species and communities.
 - o Pursue opportunities for ongoing educational partnerships with Flagstaff Arboretum and Forestry School
- Adopt a pruning strategy within the North Quad to:
 - o Improve the architectural (i.e. space-defining) role of the tree canopy
 - o Enhance views of important tree specimens, views of significant architectural features (building entrances, etc) and vistas of the surrounding mountains. This will involve crown thinning, limbing up and select removal of branches.
 - o Improve the structural stability and branching pattern of existing trees and address deferred maintenance.





Several existing quad trees are part of the University's Arboretum, whose stated mission it is to "preserve historic and interesting plants on campus, maintain and enhance the beauty of the campus and to educate the University and greater Flagstaff communities about these plants."



This map shows historic district boundary and the five existing buildings which are listed on the National Historic Register.





Future University Green and Transit Spine with new Bookstore & Parking Ramp

Observations: & Recommendations:

- The campus does not have a strong central open space. While the North Quad serves as the ceremonial heart of campus it is also quieter and more contemplative, not an active, student life gathering area.
- As obsolete buildings and inefficient parking lots are removed from the north core, there will be opportunities to create new open space for student activities.
- Service areas dominate the east-west routes in the center of campus; improving pedestrian connections to the pedway and the transit spine should also include consolidation and screening of these areas.
- Portions of the north campus core are situated within a 100-year flood plain, and the small open space that exists floods with storm runoff, so new green spaces should be designed to manage storm water.



Existing central space and transit spine route in front of the bookstore



UNIVERSITY GREEN

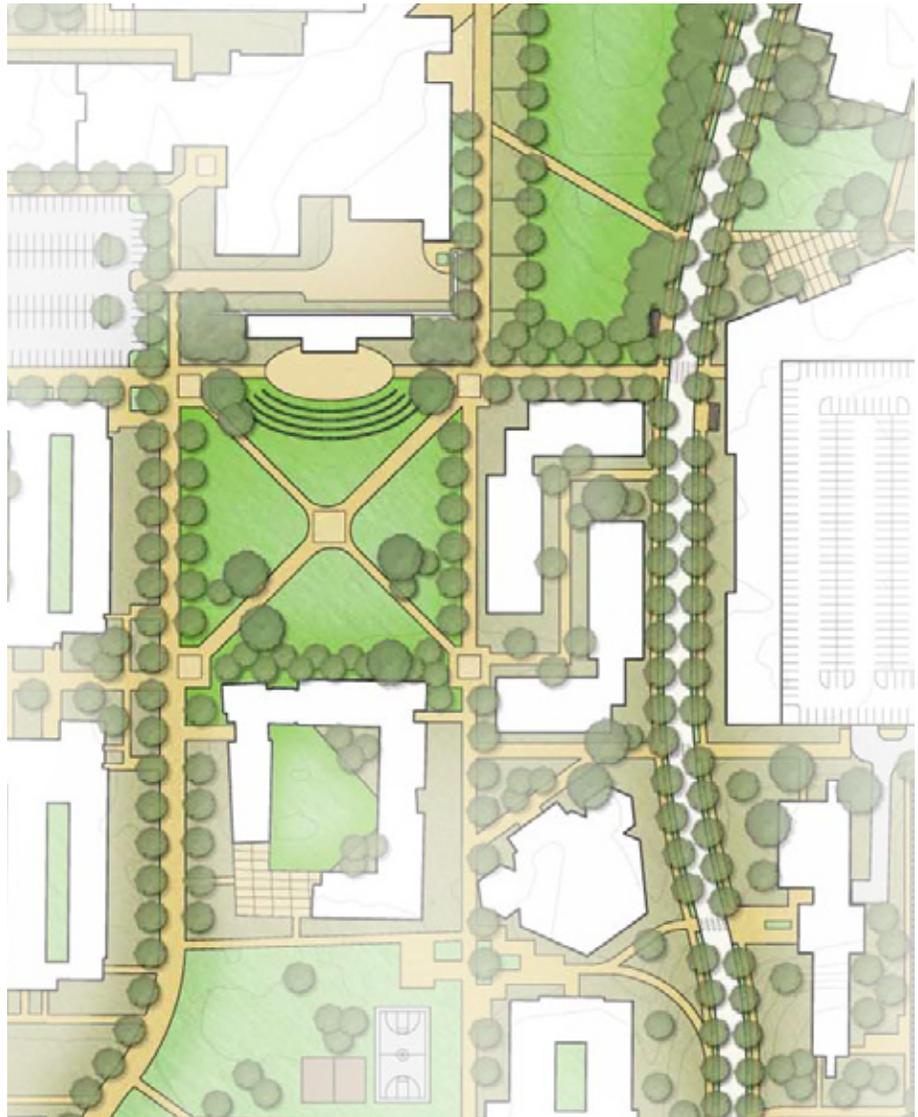
University Green is a proposed new green open space in the heart of the campus. Located between the front door of the University Union and University Bookstore, the University Green is created by demolishing an older residential hall. The space is defined by the central pedway on the east, the new transit spine on the west, and significant pedestrian connections along the north and south edges. The space will be further framed by new architecturally prominent academic buildings on the north and south edges. These major routes and active uses will enliven the space creating opportunities to integrate learning and student life and transform the center of the campus.



The landscape character should be traditional with a central open lawn and a strong, well-defined spatial envelope. The eastern edge should be developed with a tree planting or bosque which further defines the space. Snow storage should be accommodated along the along western edge of the open space. Integrate stormwater management and flood events by depressing the central lawn area. Additional stormwater management elements should be designed to support the spatial definition and double as informal seating. Provide more intimate spaces around the perimeter with a variety of seating opportunities.

Observations & Recommendations:

- The north-south pedway appears to split around the services areas of the University Union creating conflicts; the 'mixing bowl' must clarify the pedway route;
- This is also a vital east-west connection through the campus, which needs to better accommodate pedestrian, bicycle and service access;
- The campus would benefit from an informal outdoor gathering venue within this active residential area;
- Service, trash and loading uses in this area should be screened and separated from pedestrian-cyclist routes for safety;
- This area needs a well defined edge and center, combining walls (including low, terraced seat walls), trees and landscaping to create a space for central activity with surrounding places for students to linger;
- This space should work in harmony with the proposed University Green to effectively manage snow and storm water runoff.



MIXING BOWL

University Green is a proposed new open space arising out of the apparent 'split' in the pedway at the University Union, where several paths weave (thus the mixing) through the student housing area north of University Drive. On the south side of the Union, the 'Mixing Bowl' would reconnect the pedway across a traditional lawn providing an informal gathering area for outdoor concerts and performances. A raised stage with a backdrop would effectively screen the loading docks on the south side of the Union, improving and reinforcing a central east-west connection across the campus. The sloping lawn would be framed with planting of tree rows along the perimeter paths, and snow storage, a problem in this area, could be provided along the along west edge with the depression helping with runoff storage.

Observations & Recommendations:

- The pedway loses definition as it reaches the south edges of the campus, winding around buildings and parking lots; the plan recommends improving the pedway through and past the south quad, with a clear path extending all the way to the new recreation fields and south apartments.
- Additional paths should be extended diagonally across the quad to connect destinations (bus stops, dining, buildings, parking, etc.) and enliven the space;
- The south 'bowl' is an oversized quad, not well defined and lacking shade trees and places to gather; the plan recommends investing in improvements to this open space;
- Line the edges of the space with rows of trees and low seating walls;
- Create a balance of open lawn areas and well planted courtyard gardens and paved terraces providing new opportunities for informal gathering or outdoor classes/lectures.
- Reinforce the spatial envelop of the existing quad, and the proposed new quad, with new buildings.



SOUTH CAMPUS BOWL

The south campus core is organized around the 'south bowl', a large open space that feels over scaled and uninviting. The bowl is framed by some of the newest and highest quality buildings on campus, as well as some of the buildings in the worst condition. The master plan proposes a phased building replacement program which better defines the existing space and adds a second more traditionally sized quad. The south bowl plan allows for a balance between areas of open lawn, well planted gardens, and paved open terraces which provide opportunities for informal gathering or outdoor classes or activities. Even though the topography is a little more challenging at the south end of the campus, landscape and hardscape improvements can provide a greater sense of continuity to further knit the campus together.



Existing Runke Drive



Future Greenway lined with Student Housing

GREENWAY & HOUSING

The plan adds student housing mid-campus to increase density and accommodate projected growth. The new greenway which replaces Runke Drive extends pedestrian and bike paths eastward to connect to the Observatory, existing informal recreation fields and the new Hilltop apartments. Student housing lines the greenway, with resident parking located on existing lots behind and below the new housing buildings.



Landscape Recommendations:

- Develop a strong linear landscape along the ridge line in front of the Observatory building.
- This will be centered on a new east west primary walkway with seating and gathering places at special nodes, intersections and building entrances.
- The planted character of this area should be an abstraction of the natural landscapes of Flagstaff, with little-to-no mown lawn.
- A continuation of the existing tree canopy should be planted with understory shrubs;
- Ground plane planted with a mix of native herbaceous ground covers, low growing shrubs and native ornamental grasses.



OBSERVATORY GREENWAY

The plan proposes converting Runke Drive to a 'greenway' along the ridge line of the mid-campus, connecting new and existing housing with existing recreation fields. The greenway extends past the Atmospheric Observatory where an existing warehouse, service facilities and parking lots will be removed to eliminate sources of light pollution too close to the observatory. There is an opportunity to develop a strong linear greenway along the ridge line with a new east-west walkway/bikeway, with seating and gathering places at intersections and building entrances. The planted character of this area should be an abstraction of the natural landscape with little-to-no mown lawn and a mix of native herbaceous ground covers, low growing shrubs and native ornamental grasses under the tree canopy.



Northern Arizona University Flagstaff Campus Plan

Traditional Quadrangles:

- Large, central to the campus
- Iconic synonymous with institution
- Balance of open lawn and shade trees
- Simple network of pedestrian paths

Plazas:

- Paved open spaces
- Situated at the campus “crossroads”
- Active spaces for community life
- Programmed to attract many users
- Fixed and movable seating
- Opportunities for water features

Garden Courtyards:

- Smaller, more intimate spaces
- Primary users from adjacent buildings
- Outdoor classroom opportunities
- Integrated stormwater management
- Plant collection as educational tool

Perimeter and Landscape Entrances:

- Distinguish campus entries, edges
- Create identity, sense of arrival, welcoming environment
- Define edge w/plantings or walls
- Gateway elements or structures

Woodland and Habitat landscapes:

- Remnant natural landscapes
- Often undeveloped because steep slopes, existing stream corridor
- Demonstrate institution’s commitment to environmental stewardship
- Manage plant and animal community
- Opportunities for regenerative stormwater conveyance
- Educational opportunities
- Network of trails critical to being a widely used amenity.

Recreational and Athletic Fields

- Open spaces close to core of campus
- Contribute to student life, sense of community and educational mission;
- Artificial vs. natural turf
- Integrate maintenance infrastructure
- Accommodate spectators w/bleachers or informal seating on graded slopes





LANDSCAPE DESIGN PRINCIPLES

The landscapes that have traditionally been associated with American colleges and universities—landscapes such as traditional quadrangles, courtyards, and open lawn areas with the dappled shade of tall canopy trees—were developed in the temperate conditions that exist in the Eastern United States and the British Isles. The high desert setting of the Flagstaff campus does not naturally lend itself to cultivation of these traditional east coast campus landscapes. At the same time, there is a strong demand for traditional collegiate spaces to meet expectations for what a campus should look like, to support student life and recreation and serve as a tool to attract and retain the best students and faculty. Accordingly the campus landscape should seek a balance between traditional spaces and more natural open spaces to create a balanced sustainable approach. The master plan creates four types of landscapes, to be applied where appropriate to achieve a workable mix of traditional and natural open space.

Traditional Collegiate Landscapes

There should be several well-defined and manicured landscape spaces, with wide open lawn areas, a high canopy of trees (pruned regularly to maintain good tree architecture) and select foundation plantings. These spaces will enhance the collegiate character of the campus. They should be centrally located to show off to prospective students on tour with Admissions, and to accommodate special ceremonies and fund raising events.

Active Collegiate Landscapes

These open green spaces are useful for student recreation and informal gatherings. They will still require traditional lawns, but may not need the same intensive turf management required by the traditional collegiate landscape. These areas can also double as storm water management infrastructure or as snow/flood storage facilities.

Hybrid Landscapes

Much of the landscape and open space on campus serves as a green backdrop for campus life, rather than as a formal space programmed with active uses. These are settings where a palette of native plants can be used to simulate academic landscape types, but without the intensive water-usage and maintenance requirements of a traditional exotic planting design. These areas should be designed as an abstraction of the native environments, rather than actual wild habitat; they should appear to be well-maintained but without any need for mown lawn or permanent irrigation.

Natural Landscapes and Open Spaces

Other areas on campus will be appropriately managed as natural landscapes. General access to many of these areas will be limited, but well-designed trails can provide access to the broader University community as well as residents of Flagstaff, making the natural landscape a campus amenity. Efforts should be made to control invasive species within these environments.

Plan Selection Principles:

- Encourage the use of drought tolerant native plant species
- Use non-invasive, drought tolerant exotic plant species selectively
- Right plant, right place: planting design must respond to existing campus micro climates
- Abstract the plant communities of northern Arizona to convey a sense of Flagstaff's regional character.
- Adapt to the traditional language of campus landscapes as well as to more naturalistic campus landscapes
- Brand precincts with consistent use of plant texture, shapes and colors
- Select species for year-round interest, with special attention to Fall, Winter and Spring to maximize interest during the academic year
- Select species for salt tolerance (magnesium chloride) for areas that take runoff or snow melt from plowed surfaces and for snow storage areas.
- Planting close to walkways and building entrances should meet Crime Prevention through Environmental Design (CPTED) guidelines



Landscape Management

Goal is to manage the landscape effectively, efficiently, and sustainably.

- Select plant species that are well adapted to their micro climates. If the plant is well suited to the conditions that exist, it will experience fewer stresses and therefore be less subject to attack by pests.
- Design to fill all niches for plant growth—if there is a void, it will be filled by unwanted volunteer plants. If all voids are filled, there is less opportunity to invasion by unwanted plants and weeds.
- Provide the right conditions, and additional support as needed, during the establishment period to aid in the maturation of a healthy and vigorous plant community:
 - irrigate as appropriate.
 - prune woody plants.
 - remove unwanted volunteers.
- While total elimination of chemicals is not feasible today, it can be a goal to work toward. Experimental methods for eradicating weeds or pests should be substantiated through research and limited application, prior to application across the campus.
- Explore partnership opportunities with Flagstaff Arboretum and School of Forestry to fund and conduct research on IPM in Northern Arizona's high desert and mountain landscapes.

LANDSCAPE, PAVING AND SITE AMENITIES DESIGN STANDARDS

While the university has existing site design standards and specifications, they have been inconsistently applied from one construction project to the next. As part of an improved design review process, these standards should be kept updated and should be actively applied to determine all site furniture, fixture and paving selections for all campus projects. This will ensure a more consistent and attractive campus character, while also increasing the efficiency of operations and campus maintenance. Preference should be given to enduring materials, selecting components which are readily available and use common methods for replacement and maintenance. Over time, there may be reasons to update the standard for a given element, but changes or exceptions should be kept to a minimum. If a new standard is implemented it's preferable to update all of the elements on campus. But if this is cost prohibitive, then changes can be made systematically over a fixed period of time.

Campus Paving Updates

The University's existing paver is no longer available and the stockpile of replacement pavers is dwindling. The University therefore needs to adopt a new paving standard. This is an opportunity to update the campus brand and to unify the campus landscape with a more consistent use of materials. Recommendations have been made for primary, secondary and tertiary walkways, using pavers and concrete, as well as bike-ways which would continue to be asphalt.

Site Accessibility

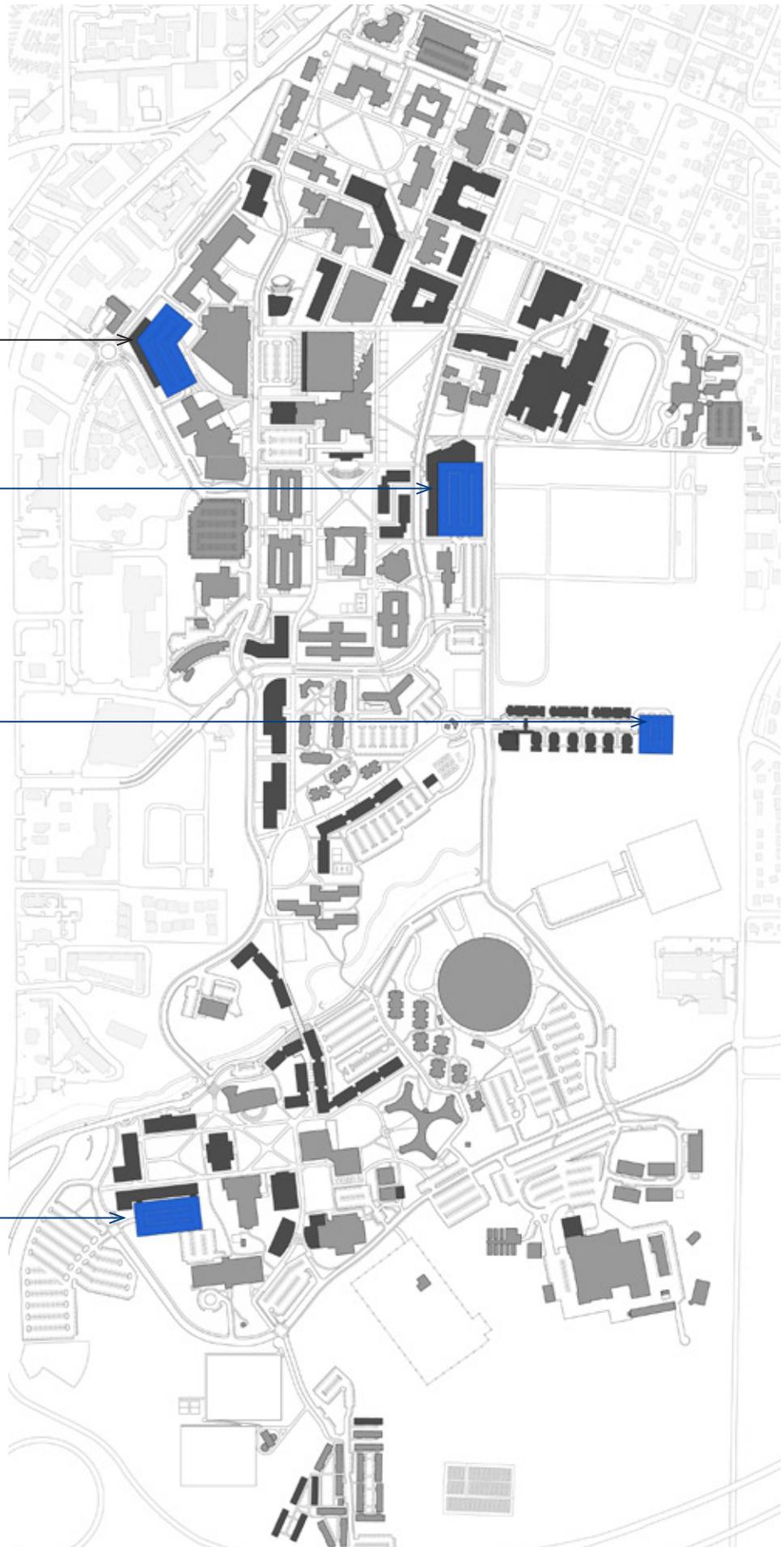
Campus-wide accessibility is a university goal. ADA Standards and ADAAG should be applied to all entries, plazas and sidewalks. For campus trails, we recommend that the University refer to the U.S. Access Board's Draft Final Accessibility Guidelines for Outdoor Developed Areas (October 19, 2009) as a guideline for defining accessibility. These guidelines apply to a number of Federal agencies, including the U.S. Forest Service, the National Park Service and the Army Corps of Engineers. These guidelines are specifically tailored to address trail design and construction, including: tree protection, preserving the integrity of natural drainage patterns, rock outcroppings and topographic character, and preservation of natural and historic features while accommodating accessibility.

Parking Structure
estimated 1500 parking spaces lined with active service and support uses

Parking Structure
mixed-use parking ramp to accomodate more than 1250 parking spaces, student bookstore and dining

Hilltop Parking Structure
parking deck for new student housing

Parking Structure
estimated 1500 parking spaces with new nursing and health professions building.



RELOCATE PARKING



Existing campus parking distribution

Moving parking spaces out of the campus cores and into parking garages close to campus gateways is a key strategy for the master plan with significant benefits in several key areas:

- Campus traffic is reduced improving travel time for the on-campus buses.
- Improved on-campus bus service makes parking on the perimeter and using the bus system more attractive, resulting in increased ridership;
- Visitors can easily access designated parking, using a kiosk to pay for a permit;
- Existing parking lots become infill sites for new buildings and open spaces, enhancing campus capacity to meet projected future needs;
- Parking structures can be lined with other uses to enliven the street level and reduce the visual impact of a large structure. These uses could include retail space, classrooms or clinics, especially where public access is needed, and even campus transit/transportation offices and vehicle storage or maintenance.
- Replacing surface parking lots with structured parking reduces stormwater run-off dramatically, with added benefits of less snow removal.
- Well designed parking structures should have minimal energy use (lighting, elevators mostly) and are excellent candidates for PV solar panel installations.
- Parking structures can be an effective element in a parking demand management strategy, commanding a higher permit price while the most distant perimeter surface lots are less expensive. This approach also starts to address the higher 'per-car' cost of structures.

North Academic & Sciences Precinct
*expanding-replacing science facilities, adding
academic classroom and resource buildings*

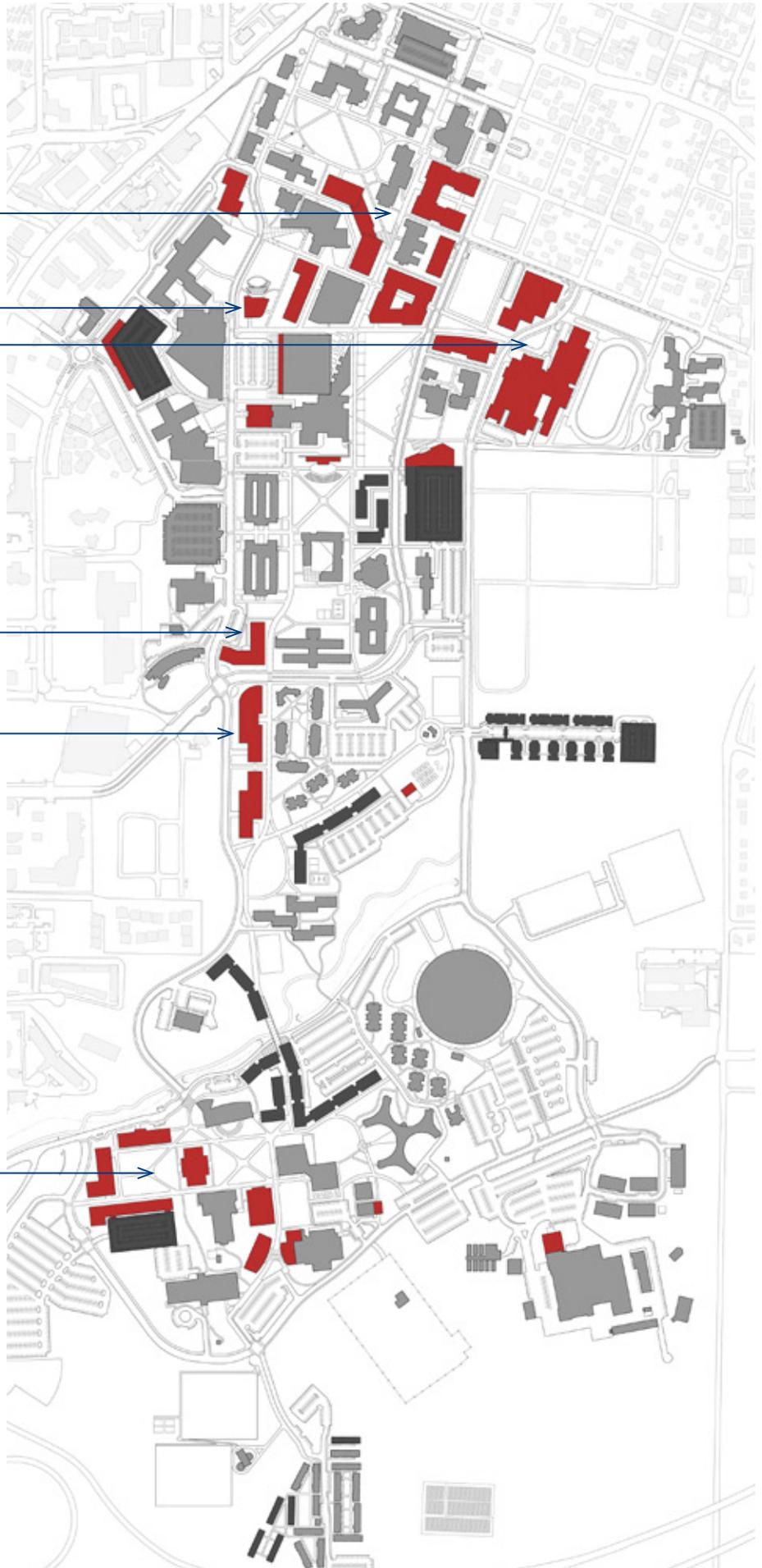
Native American Cultural Center

Health & Learning
*new recreation, health and learning center,
aquatics-natorium, rec-athletics field*

University Administration Building
including the President's office

Academic-Research Buildings

South Academic & Professional Precinct
*new buildings replacing SBS, nursing and
health professions, learning resources*



REINFORCE THE ACADEMIC CORE



Existing academic land uses.

The previous strategies make way for significant new buildings (academic, student services, recreation, athletics and support) to add capacity to meet projected increases in the number of students and to replace obsolete facilities in a carefully phased series of capital improvements. New infill building sites have been identified to decant space from buildings which must be demolished to make way for the replacement facilities. The infill buildings are planned to reinforce clustering of disciplines, such as science lab facilities. Renovation or repurposing of existing buildings has also been recommended where feasible and appropriate. The plan recommends the academic cores include new high tech, highly adaptive classroom, teaching, learning resource facilities interconnected with streamlined faculty and departmental office buildings to improve flexibility, efficiency and utilization.

The master plan strives to better connect the north and south academic cores, starting with a new Administration Building at the University Drive entrance in the center of campus. New academic and research buildings are planned along the improved mid-campus pedway, replacing the Bilby Research Center and consolidating several smaller research spaces. In the south core the Social and Behavioral Sciences buildings (SBS and SBS West) are planned for phased replacement as the southern academic precinct expands. New buildings for health professions and nursing are planned around a major new parking structure which will facilitate public access to clinical functions. Overall about 1.4 million gross square feet of core academic and support space is planned to be added to the campus.

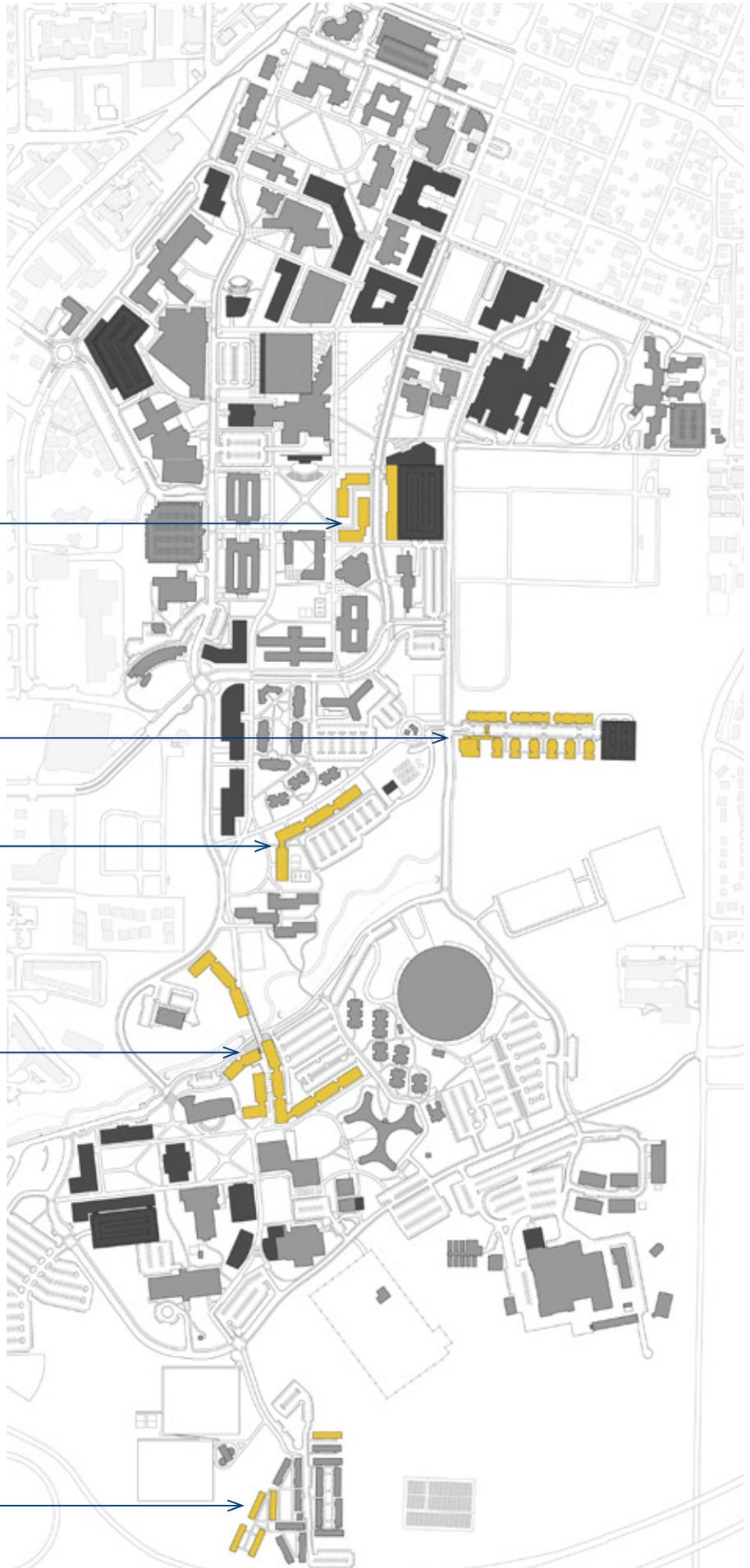
Student Housing

Hilltop Housing

Observatory Greenway Housing

South Campus Housing & Pedway Bridge

South Family Apartments



INFILL WITH STUDENT HOUSING



Existing residential land uses.

Enliven the campus with new student life facilities and new central campus green spaces to integrate academics and student life. The quality of residential life on campus has a major impact on Northern Arizona University’s student recruitment effort, since almost 45% of students live on campus. As the campus has grown, demand for housing has also grown. To keep up with that need, 560 beds of new student housing are currently under construction and approximately 2000 more are planned. The master plan also recommends incremental removal of some older housing buildings to create core campus sites for new academic buildings or major open space.

The new housing in the master plan includes:

- Hilltop Housing: new apartments off San Francisco on the mid-campus (under construction, opens Fall 2012).
- South Campus Housing: Phase 1 new student housing suites with active street and pedway level uses connecting to the new pedway bridge over McConnell Drive (under construction, opens Fall 2012); later phases add housing both north and south of the bridge;
- Observatory Greenway Housing: new student housing along the greenway planned for the former Runke Drive;
- University Green Housing: several new buildings are planned south of the new university green on the new transit spine, including the possibility of housing as part of the new mixed-use parking structure project which also includes a new student bookstore and cafe.



American Campus Communities renderings of the Hilltop Housing project located on the mid-campus. The project is under construction and scheduled to open in Fall 2012





American Campus Communities renderings of the South Campus housing project including the new pedestrian bridge and active ground level uses. The project is under construction and scheduled to open in Fall 2012



Northern Arizona University Flagstaff Campus Plan

The master plan integrates sustainable strategies to support NAU's goals to achieve carbon neutrality, including:

- increased density in the academic cores improving walkability, servicing and operational efficiency;
- more on-campus housing reducing commuting and cars on campus;
- pedway improvements to support walking and bicycling;
- new pedestrian bridge to carry the pedway over McConnell Dr;
- transit spine dedicated to buses with pedestrian enhancements, new bus shelters, bike lanes and a newer, more efficient bus fleet;
- new parking structures near campus entrances to keep traffic out of the campus core;
- removal of internal surface parking lots to create new open spaces, reducing impermeable surface area and storm water run-off;
- demand management policies to reduce parking and increase alternatives such as transit with the eco-Pass;
- infrastructure improvements including new high efficiency boilers and other improvements to the north central plant and tunnel network;
- renewed emphasis on native landscapes including drought-resistant plants and environmentally friendly maintenance practices;
- proactive management of storm water runoff to reduce flooding and reclaim/recycle for irrigation;
- expansion of areas for composting;
- increased use of renewable energy sources with planned expansion of the south solar array and recommendations for solar panel shade structure on all parking structures;
- provisions for a future central plant on the mid-campus which could explore alternatives such as biomass or co-generation;
- recommendations for updating design standards, particularly for landscaping and campus lighting, which include sustainable best practices.



“The university is highly committed to driving a sustainable future and a carbon-neutral campus.”
President John Haeger



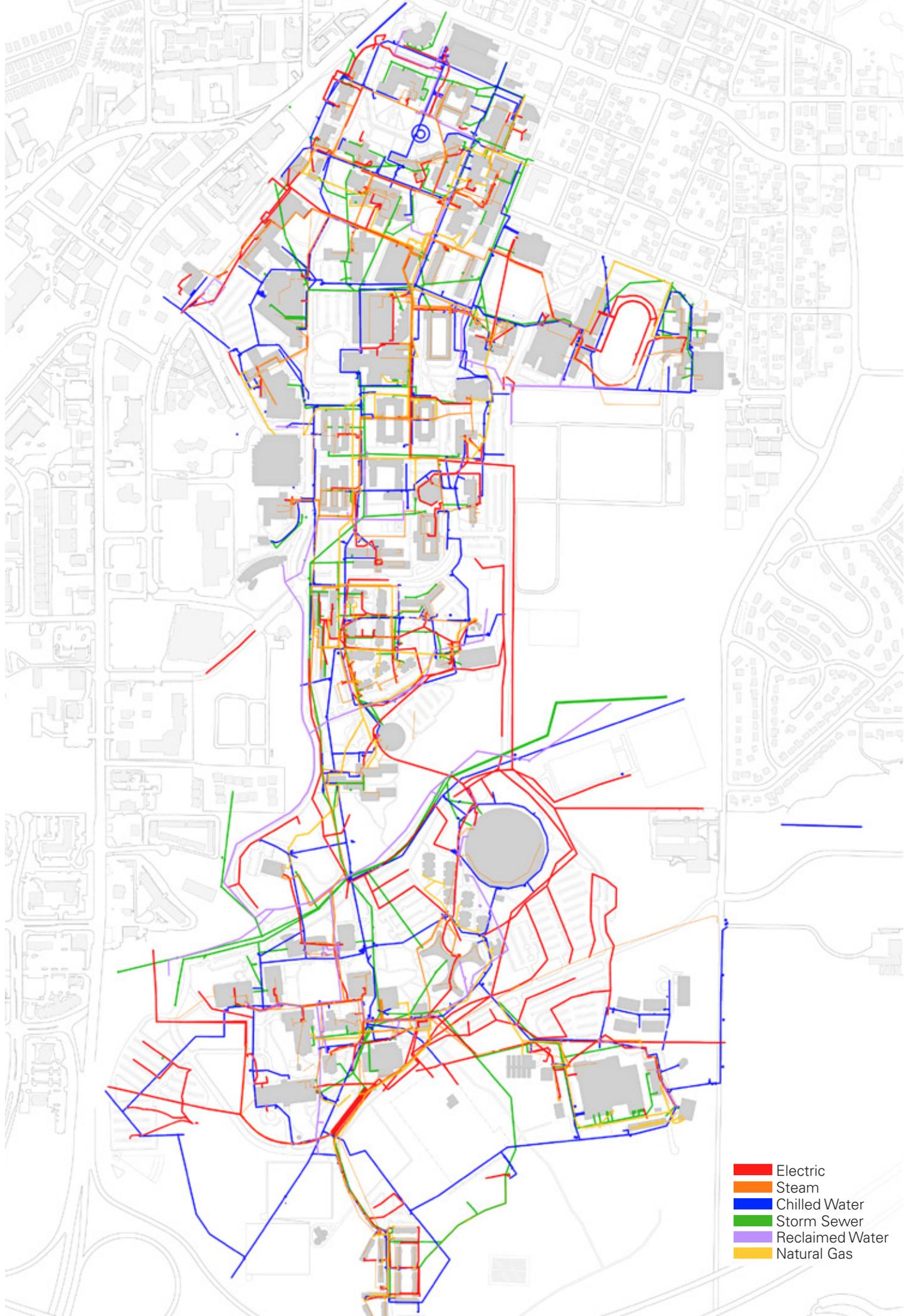
US Green Building Council LEED Certified buildings:

- 1 Platinum - ARD (above)
- 2 Gold
- 2 Silver
- 4 certification in process

CELEBRATE SUSTAINABILITY

Northern Arizona University is a leader in sustainability, according to all measures of a national organization committed to promoting sustainable practices in higher education. President Haeger was a charter signatory to the American College & University Presidents Climate Commitment and the university has set goals to achieve carbon neutrality by 2020. This commitment was an integral part of the master planning effort. NAU is one of the charter participants in STARS - Sustainability, Tracking, Assessment and Rating System compiled by the Association for the Advancement of Sustainability in Higher Education from self-reported data submitted by colleges and universities across the country. Northern Arizona University earned a Silver rating, based on meeting criteria in four categories: education and outreach; operations; planning, administration and engagement; and innovation. Each of these aspects has been considered and reflected in the master plan.

The master plan supports environmental stewardship through both planning and policy. The plan increases campus density and walkability with a variety of strategies, including infill academic buildings, removing parking from the campus interior to perimeter parking structures and adding more housing on campus. The master plan also supports sustainability with design, construction and operational standards, such as an emphasis on native landscapes, proactive storm water management and USGBC LEED certification.



- Electric
- Steam
- Chilled Water
- Storm Sewer
- Reclaimed Water
- Natural Gas

INFRASTRUCTURE

A significant element of the master planning process, is planning for campus infrastructure. Northern Arizona University asked their engineers to undertake development of a Utilities Plan and a Site Lighting Plan to be integrated into the campus master plan. This planning evaluated campus utilities capacity, including central plant and utilities distribution across the campus, in light of both existing and projected future needs. Central plants provide utilities and services for all of the major institutional buildings in each of the campus cores (north and south) and include:

- Steam or High Temperature Water (heating)
- Chilled Water (cooling)
- Electric Power Distribution

Campus utility services are zoned geographically, north and south, because of the campuses physical constraints. The existing topography and underlying geology of the central campus area make below grade utilities connections between the north and south central plants very difficult and prohibitively expensive. These same conditions mean that buildings in this central area generally have stand-alone systems. Some residence halls also have stand-alone systems, where extending steam was not feasible. Both campus central plants are connected to a distribution network which routes services to individual buildings. These utilities service routes create an underlying organizational structure which set the framework for all new campus development.



North Campus Central Plant

North Campus

The North Campus Central Plant provides central steam heating to almost all of the major buildings in the north campus core. This plant is being upgraded with two new high efficiency boilers. Three older boilers provide redundancy, but this equipment is at the end of its expected life and will need to be replaced over time. Current peak loads for the north core is about 70,000 #/hr. and the north plant improvement project is increasing plant capacity to over 80,000 #/hr.. This will accommodate approximately 225,000 gsf of new buildings to be added in the near future.



Utility tunnels in need of improvement.

The north central plant also provides cooling, with four chillers providing a capacity of over 2000 tons of cooling to meet a peak load of 1100 tons. This capacity will accommodate the new Health & Learning building, and an estimated 200,000 gsf of new buildings in the future. Renovation or replacement of older, inefficient buildings may also free up heating and cooling capacity for future expansion.

Improvements to the north central plant include upgrade of the electrical system, with new switchgear and distribution system designed for future expansion. Two major feeders connect to the utility service, with current capacity for over a half a million gsf of added building area. Other plant improvements include building envelope improvements for service accessibility, efficiency and aesthetics; and planned in flexibility for equipment replacement and systems upgrades, as well as potential future expansion or options for alternative energy sources such as cogeneration or ice storage.

The north campus has an extensive system of tunnels which, in addition to direct bury piping, convey major steam pipes. Many of these tunnels are in very poor condition, with water infiltration, broken or missing pipe anchors and other structural concerns. These tunnels also have been used for distribution of power and data and communications cabling, which is not an ideal situation. High temperatures in the tunnels reduce cable life and complicate servicing and security, and the proximity of electricity and water is a safety issue. The utilities master plan includes planning for phased tunnel upgrades including dividing the tunnels to separate steam pipes from conduit and cabling, waterproofing and reinforcing to improve structural integrity, safety and security.



Shallow utility channels are most common on the south campus. Loading above utilities is a continuing concern.

South Campus

The South Campus Plant provides central high temperature water heating to the major buildings in the south campus core. This plant’s boilers are much newer than the north plant, with three high efficiency boilers providing redundancy and substantial capacity beyond peak load.

The South Campus Plant also provides cooling, with two chillers providing a firm capacity of over 500 tons of cooling to meet a peak load of 300 tons. In addition to the excess capacity, this plant has room for expansion to accommodate new buildings in the future. Replacement of several older, inefficient buildings may also free up heating and cooling capacity for future expansion. Planned improvements to the south plant include piping upgrades and efficiency improvements. While there is flexibility within the plant for future equipment and systems upgrades, expansion of the distribution system further south would require expensive rock excavation.

The south campus has a system of utilities channels for major distribution and service access. This system is designed for expansion as this part of the campus is further developed. The south campus electrical distribution system is a looped system, with a single feed from the utility and a capacity for up to a million gsf of new buildings.

Also located on the south campus is the PV array, converting solar energy to electricity. The PV array is planned for expansion in the future.

Campus-wide Services

The campus benefits from City water service for both domestic service and fire protection service and capacity is generally not a concern. A master meter system monitors potable water demand. The campus continues to reduce water usage by promoting water conservation and making water efficiency improvements. But the original distribution system dates to the early 1900’s, so a program of scheduled pipe replacements and upgrading is vital to maintaining service. A city-wide reclaimed water system has also reduced potable water use on campus. The new distribution system on campus allows reclaimed water to be used for irrigation of landscaping and major turf areas. Over time this system should continue to expand, both in volume and areas covered, with the campus reclaiming and recycling water where feasible.

The campus is also serviced by natural gas, with four master meters and service at both the North Central and South campus plants. This system also requires ongoing upgrades to both piping and valving.

Campus wide sanitary and storm sewers discharge into the City system and generally capacity is not a concern. Older mains, mostly on the north campus, should be regularly evaluated and scheduled for upgrading as necessary.

Campus Lighting

The Campus Lighting Master Plan is intended to be an integral part of the overall campus master plan, and should be addressed in each master plan update. The lighting plan discusses the existing campus lighting, identifies deficiencies, and addresses locations for improvements, with recommendations for future lighting elements. The plan anticipates that future updates will be required to accommodate new technology, changes to codes and to guide detailed lighting improvement efforts. In the future advancements in technology could provide new options for enhanced performance, which should be incorporated into campus design standards.

Campus Lighting Master Plan Goals and Objectives

- Enhance the campus environment.
- Optimum nighttime visibility, safety and functionality.
- Conform to the City of Flagstaff Outdoor Lighting Code.
- Sustainability with improved energy efficiency and maintainability.

Lighting Plan Recommendations:

- Establish luminaire standards for streets and parking areas to maintain continuity and campus identification, as well as ease and efficiency of maintenance.
- To move toward a more consistent campus wide aesthetic it is recommended that street light poles be replaced with straight round poles with the ability to attach banner arms. This would encompass all poles with the exception of the Cline Library and historic area of the north campus quad.
- Chose a “dual lighting system” with both pedestrian and roadway lighting components for all areas of high pedestrian and vehicular activity.

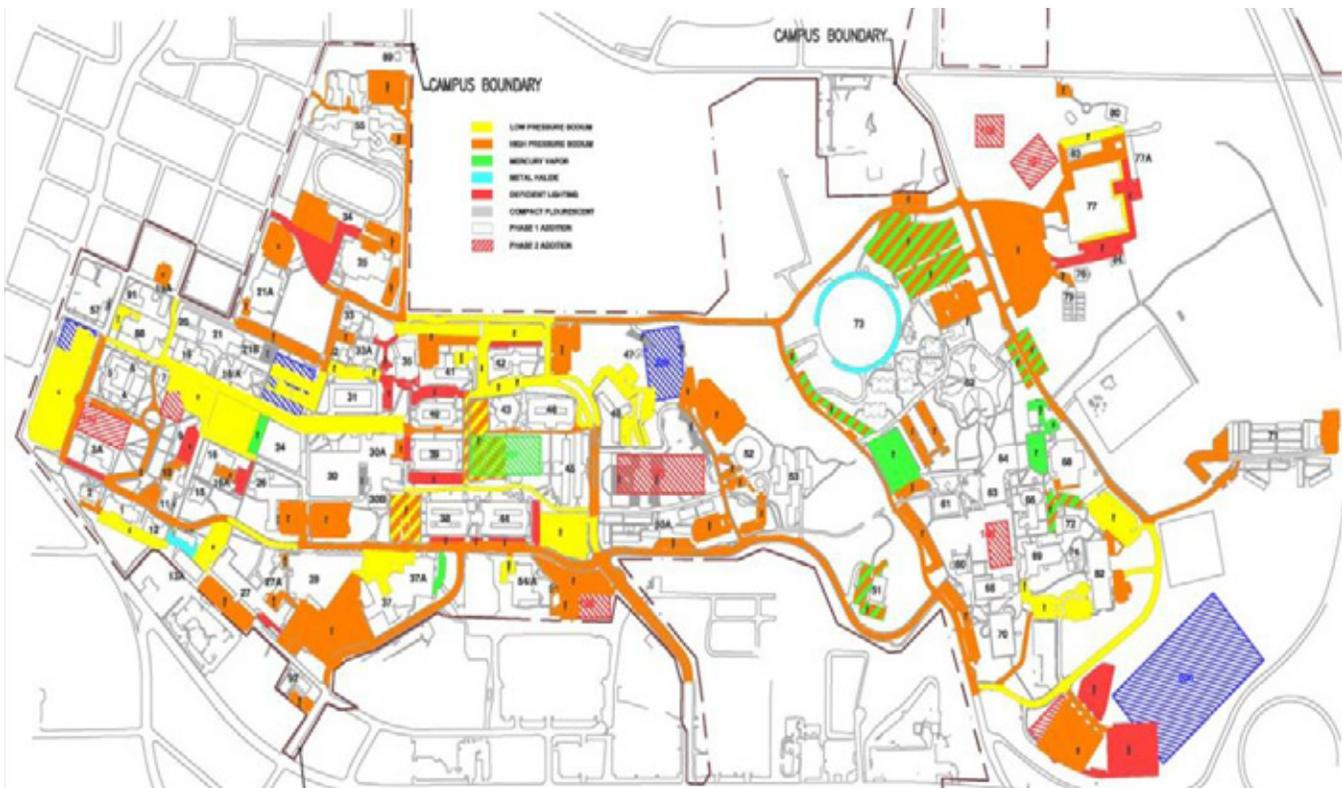
The key to quality exterior lighting is to place light only where it is needed, without causing glare, to improve visibility, while reducing energy used and improving maintenance. Design criteria includes basics such as lighting levels (illuminance), uniformity, and brightness balance (luminance), as well as recommendations for reducing glare, light trespass, and light pollution. The basic considerations in site lighting for the Flagstaff campus include nighttime safety and security. Safety involves providing light on potential hazards so that they are detected with sufficient reaction time. Hazards may include pedway, bikeway, and vehicle intersections, crosswalks, stairs and ramps. The lighting system is one of the many site design elements which provide visual information to assist campus users in navigating safely. Security is the perception of safety. Providing for security involves enhanced lighting at potentially hazardous locations which increases visibility and serves as a deterrent. Human night vision is very sensitive to short wavelength light (blue and green light), resulting in crisp and clear vision. Reaction time under low light levels is far superior with white light sources and color identification is also much easier. Good visibility must also address contrast: color contrast and value or brightness contrast. Both are important, however value contrast is especially important in low-light nighttime situations. This supports the addition of white light in high pedestrian areas. Glare is usually caused by uncontrolled light emitted from unshielded luminaires and can interfere with visibility.

Light trespass is sometimes referred to as the “light shining in my window.” The usual culprits of light trespass are unshielded floodlights, high wattage pedestrian lights, wall packs and other unshielded luminaires that are improperly located and poorly aimed. Light pollution is uncontrolled light that travels into the atmosphere. This light is wasted energy and creates a “sky glow” effect. Fortunately, the same techniques used to minimize glare and light trespass will also minimize light pollution - careful selection of low wattage, shielded luminaires that are properly located and aimed.



Luminaires within “line of sight” of the campus observatory need to be completely shielded such that no light from a lamp, refractor, or reflector is visible from the observation decks.

Lighting at campus entry points is used to improve evening time recognition of the entry and to help guide people into the campus for events. In addition, lighting at entry points is used to reinforce campus image, identity and character. Campus entry areas should have some of the highest light levels and most effective controlled brightness. These entry points are areas with major pedestrian and vehicle traffic, with high potential for conflicts, so lighting for safety is necessary. Intersections of campus streets with City roadways require special consideration and need as much as 50% more illumination than the adjacent streets. In these areas where both vehicles and pedestrians are present, a combination or “dual lighting system” should be introduced. The dual lighting system has both pedestrian and roadway lighting fixtures, each set at the appropriate height. Primary road and pedestrian paths should be continuously lighted, with the greatest frequency of luminaires. Secondary paths should be lighted with less frequency. Pedestrian gathering areas and tertiary or filter paths should combine path lighting with other lighting techniques to ensure continuity. Studies have demonstrated that there is better visibility under white light vs. low pressure sodium and better visibility enhances student safety. So light sources should combine white and amber LED, in a full cut-off luminaire, in locations with high pedestrian activity, such as campus entrances, the transit spine, all bus stops, major cross walks and the central pedway.



Existing campus light source types, 2010



IMPLEMENTATION



An Implementation Plan is critical to successfully realizing a campus master plan. Implementation issues including the phasing and staging of utilities infrastructure to allow for building replacement, were critical to developing the Campus 2010 Master Plan. Although the campus density is not high (mostly 1-2 story buildings) the campus cores, especially the north core have been built-out over the years leaving very few open building sites available. Many of the existing buildings are inadequate for their currently programmed uses (several academic buildings are re-purposed dormitories) and are in poor condition and not viable for renovation. But to replace these structures, space must be available in new buildings so departments can be relocated and the older structures demolished. With the current enrollment pressures and poor facilities conditions, even renovation projects are difficult to accomplish.

Implementation of facilities projects also requires an in-depth understanding of campus infrastructure, reflecting the interconnected nature of all development on campus. Each building project must be supported by infrastructure: central plant capacity (heating, cooling); systems capacity (electricity, sewer, water); distribution systems (utilities tunnels, chases or direct-bury); service and emergency vehicle access as well as drainage, storm water management and landscaping. This level of understanding and integration allows needed investments in enabling infrastructure to be identified and effectively planned and the benefits more fully realized.

PHASE 1: First Moves (0-5+ YEARS)

North Union
(renovation to be completed Feb 2011)
Historic Quad Improvements

Liberal Arts
(renovation to be completed Feb 2011)
Science Health building
(build in two phases)
Native American Cultural Center*

North Plant
(renovation to be completed Aug 2011)
North Academic Building*
Field House-Event Venue Renovation

Inn at NAU/HRM
(renovation to be completed Mar 2011)
Health & Learning Center
(construction to be completed Aug 2011)
Mixed-use Parking Garage *
w/bookstore, student services & housing

Transit Spine
(construction to be completed Aug 2011)

Hilltop Housing

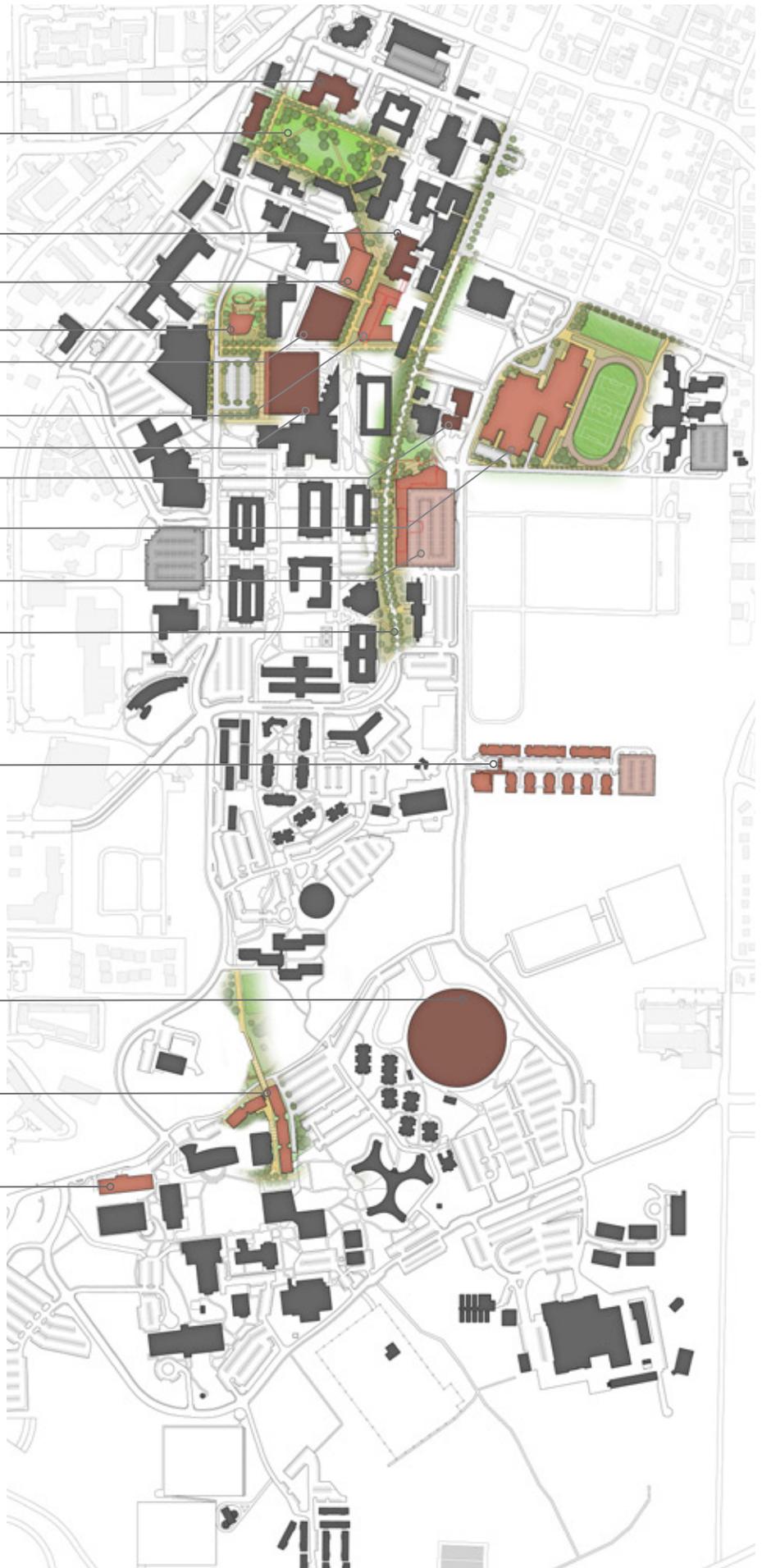
Skydome renovation
(renovation to be completed Aug 2011)

South Campus Housing & Pedway Bridge

South Academic Building

Enabling Infrastructure Projects include:
North Plant Boiler Replacements
North Plant Chiller Capacity
Tunnel Improvements
Electrical Service Capacity Expansion

** indicates projects which include existing building demolition*



IMPLEMENTATION



PHASE 1 - FIRST MOVES

The 2010 Master Plan began with several projects under construction, beginning renovations, or in planning and development, including the Health and Learning facility, renovation of the Skydome, and the new Native American Cultural Center. This first phase also identified work required to enable new building projects to proceed or to demolish or replace existing substandard facilities, including replacement of aging boilers and the upgrading of the data/telecommunications center in the north plant.

Critical first moves included identifying sites for the continued expansion and replacement of laboratory facilities within the sciences core, and for a shared academic resources building, with classroom and flexible office space, to facilitate replacement of the math, geology and science buildings. The transit spine will also be part of the first phase implementation, along with a major parking garage on San Francisco (after demolition of the Fronske Health Center). Along with the transit spine, planned improvements to the pedway will improve circulation across the campus for more efficient utilization of academic resources in both the north and south campus cores. New housing on campus, provided by a private developer, will initially add 576 beds in apartment-type housing on the east side of San Francisco, and an additional 500 beds in suite-type units on the proposed pedway bridge to the south campus.

PHASE 2 – 10+ Years

North Academic Building II*

Science Health Building II*

Science Building*
(option to build in phases)

North Academic Building III*

North Academic Building IV*

Riordan Gateway & Parking Garage*

University Green*

Ardrey Auditorium Renovation

Mixing Bowl & Amphitheater*

Academic/Research Building*

Runke Dr Housing & Greenway*

Mid-Campus Central Plant

South Campus Housing II

South Academic Building II

South Green

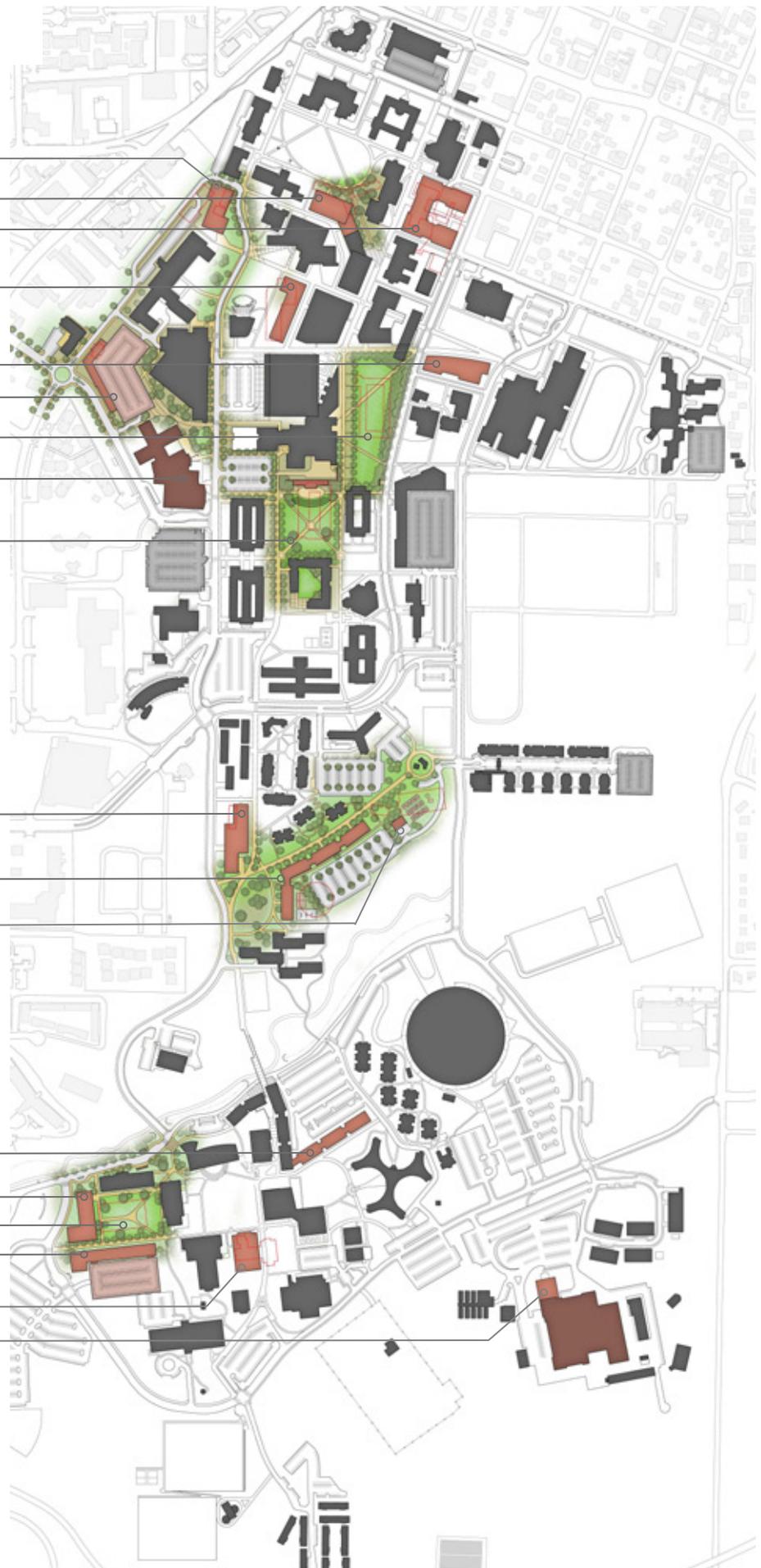
Health Professions, Nursing &
Parking Garage

Professional-Academic Building I*

Capital Assets Expansion

Enabling Infrastructure Projects include:
South Campus Utility Extension
Mid-Campus Central Plant
Mid-Campus Utilities

** indicates projects which include existing
building demolition*



IMPLEMENTATION

**PHASE 2 – THE NEXT 10+ YEARS**

The next phase looks at meeting the enrollment growth goals of the 2020 Vision Plan, with expanded academic research and housing space. While the new academic facilities in the first phase were primarily in the north core, this phase expands facilities in the south core, allowing demolition of several substandard buildings. Infill projects in mid-campus serve to connect the academic cores and enliven the pedway with active uses. New housing includes the removal of central surface parking lots and replacing Runke Drive with a central greenway, Observatory Way, connecting housing east of San Francisco to the central pedway.

PHASE 3 - beyond 2020

Science Building II & Vivarium*

Natatorium*
including recreational-athletic field

North Academic Building V*

University Union Expansion

Student Housing*

University Administration Building
including the President's office

Academic-Research Building II*

South Campus Housing III*

Professional Library/Student Learning*
including the south bowl

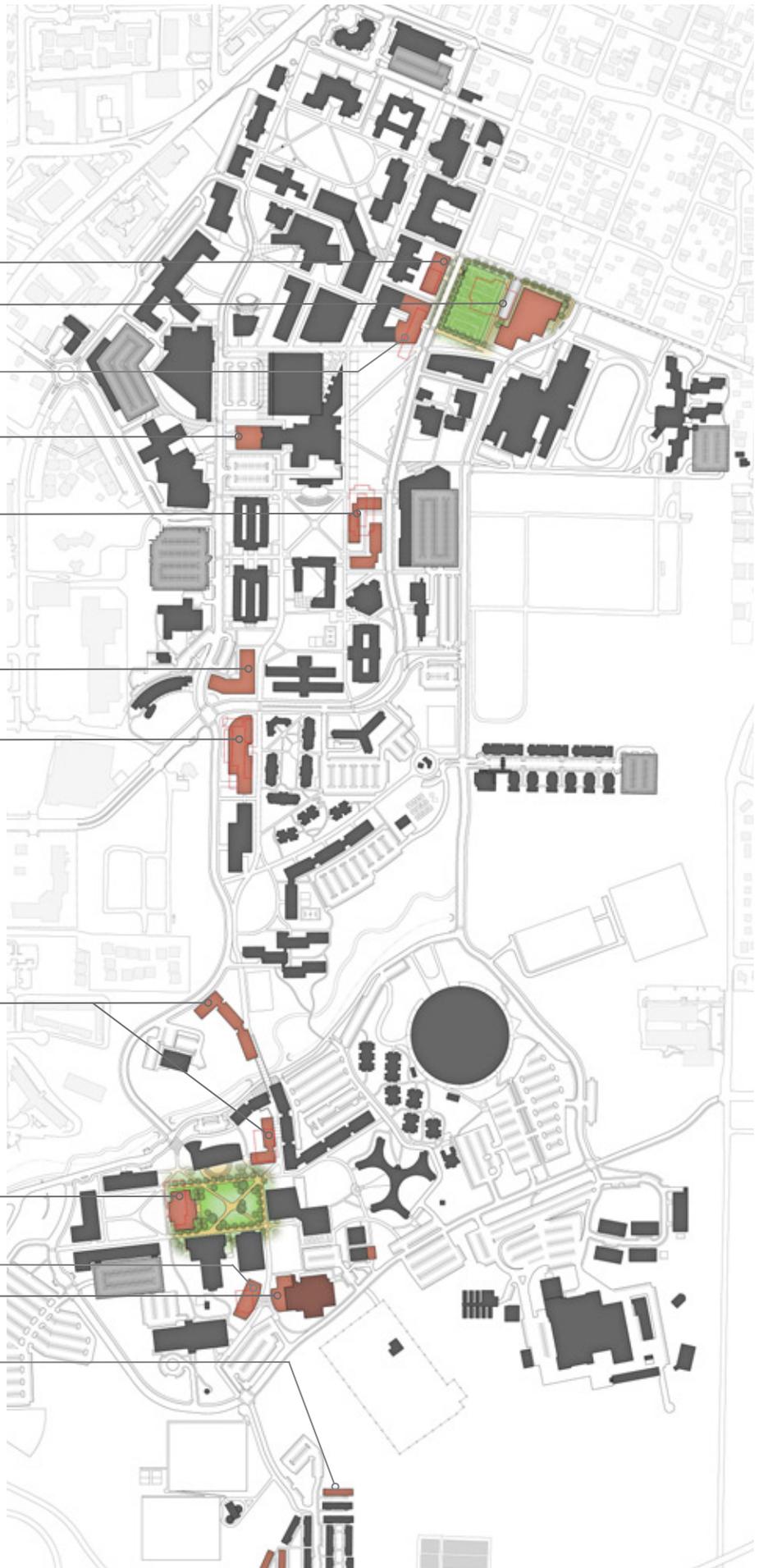
Professional-Academic Building II*

Rolle Activity Center
Expansion-Renovation

South Family Apartments Expansion

Enabling Infrastructure Projects include:
North Campus Plant Capacity
South Campus Plant Capacity
PV Array Expansion

*indicates projects which include existing building demolition



IMPLEMENTATION

PHASE 3 - BEYOND 2020

The final phase looks beyond the 2020 Vision Plan to major moves which build capacity and reinforce the quality of the campus. However this is not intended to be a final build-out plan of the Flagstaff campus. Since the Campus 2010 Master Plan needs to be pragmatic about building demolition and replacement, there are buildings in this plan which should be reconsidered for substantial renovation or replacement in the future. Each five year update of the master plan should evaluate the condition of existing facilities, determine the feasibility of investing in renovation or re-purposing of older structures and, where necessary, make recommendations for building replacement.





ACKNOWLEDGEMENTS

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