



Western Nebraska
Community College

WESTERN NEBRASKA COMMUNITY COLLEGE
FACILITIES MASTER PLAN

July 2013

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WESTERN NEBRASKA COMMUNITY COLLEGE

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Executive Summary

This Master Plan is a culmination of a several month process by Western Nebraska Community College, its Board of Governors, Executive Committee, Faculty, Staff, and Students along with the team of RDG, Alvine, and Sextant Group. The Team examined current programs and space usage needs for buildings on both the Sidney and Scottsbluff campuses. The examination primarily focuses on educational facilities and those buildings providing student support. The Master Plan looks not only to the near future but also for the next 15+ years to identify needed areas of growth as well as potential future expansion opportunities.

The Master Plan serves as a road map for the future of WNCC. This report serves as the framework for those facilities highlighted during the programming process. This long-term view of the Scottsbluff and Sidney campuses provides the Board of Governors a tool for organization and development of these campuses.

Input was provided through a series of informational workshops. This feedback was instrumental in guiding the Team as the Master Plan moved forward. The Master Planning process involved the contributions of not only WNCC repre-

sentatives but also members from the surrounding communities of Sidney and Scottsbluff, including local city leaders, health care representatives, business leaders, and alumni. This additional information provided a better understanding of the contributions that WNCC makes to the communities in which they belong and the important role that they play in advancing the education and employment opportunities of their students.

WNCC Philosophy and Underlying Guide

The following beliefs taken from the Board of Governors Strategic Plan became the foundation on which the future of WNCC is built and the Master Plan is based:

- **Belief in the inherent right of every person to an opportunity for education commensurate with the individual's potential and interest.**
- **Responsibility for providing an environment that offers opportunities for developing quality in academic, technical, and vocational disciplines.**
- **Commitment to lifelong learning.**
- **Awareness of the changing role of education.**

Findings

The Master Plan identified site and facility issues that need to be addressed in varying degrees either now or in the near future. As part of the report, several projects were also identified as more long-term projects that can be reviewed periodically as the needs arise. While WNCC is not expecting its student population to grow in the near future, the ability to recruit and retain students becomes ever more important as the population in the Panhandle continues to decline. A major component to this approach is the condition of the facilities for the students and their ability to have the best experience possible during their time at WNCC.

As the Main Building serves as the hub of the Scottsbluff campus, its ability to provide students with access to resources and interaction space as well as its response to instructional and administration needs, makes its renovation and expansion a critical element in the overall development of the Scottsbluff campus. The Main Building does not meet accessibility guidelines, is lacking proper HVAC, is poorly configured for student engagement, and is fundamentally inefficient in terms of staff and faculty organization. The reconfiguration and addition to this building is outlined further in this report including the renovation and reconfiguration of the Theater and Music departments.

Another immediate facility need is the renovation of Pioneer Residence Hall. The currently facility does not meet accessibility guidelines, has poor heating and cooling control, and provides obsolete accommodations compared to other facilities on campus as well as those at peer institutions. The installation of an elevator to provide accessibility to all levels along with upgrades to the restrooms and shower rooms and new HVAC systems will begin to respond to the needs identified here and in the 2012 Facilities Conditions Assessment report.

This report also identifies additional upgrades and renovations to other facilities that will improve operation efficiency and the overall student experience as well as the campus itself, including circulation paths for pedestrian and vehicles alike. Also identified are potential new building sites that work in the framework of the new pathways and green spaces to create a true campus feel.

This report not only evaluated the spaces within the facilities but also the systems that provide heating and cooling for each of the facilities on campus. Building off of previous reports and analysis, the team identified four strategies for evaluation:

- 1. Strategies and standards that can be implemented on a campus-wide basis**
- 2. Sustainability strategies that can be implemented in the Western Nebraska Community College (WNCC) facilities regarding mechanical/electrical systems**
- 3. Ideas regarding equipment replacement and maintenance timelines**
- 4. Concepts for reducing energy consumption**

A common theme in both the MKK 2002 report as well as the EMG 2012 report is that the facilities have been well maintained. It is a significant credit to the culture, work ethic, and efforts of the WNCC staff that this comment is so predominant in these reports. In viewing the photo documentation of the facilities, it is apparent that there is a significant level of pride taken in the ongoing maintenance and care of the mechanical/electrical systems and the facilities in general.

In addition to having a well-trained and committed maintenance staff, it is critical that the appropriate capital funding is provided. An annual budget line item for ongoing

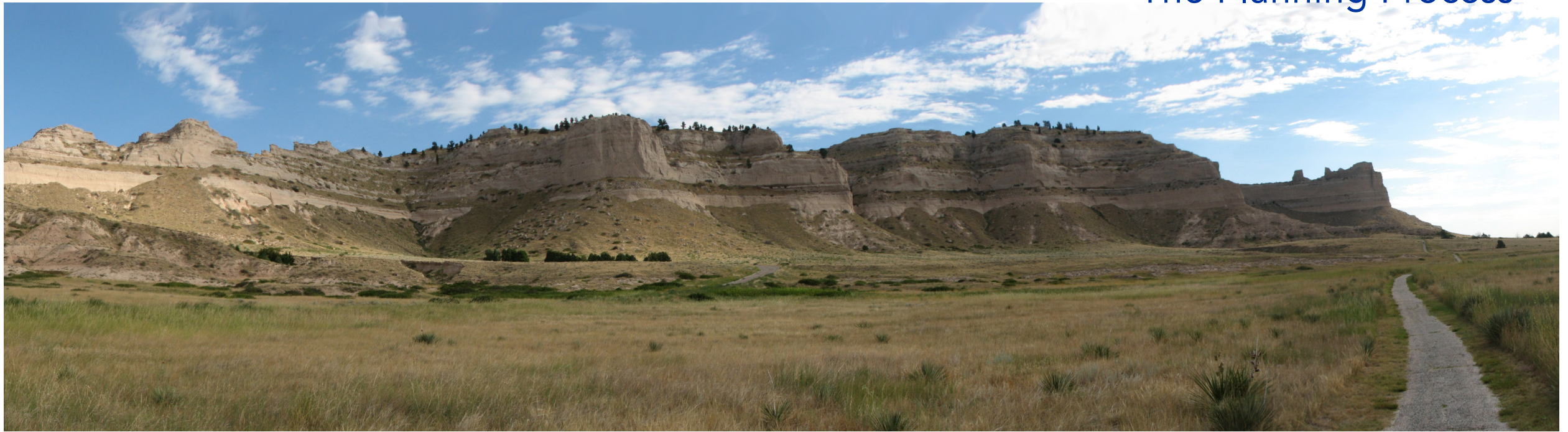
deferred maintenance should be provided as a part of the annual facilities budget. Generally, this line item is related to a percentage of the capital value of the facilities and equipment.

WNCC has the advantage of having capital cost estimates for equipment repair and/or maintenance. These values can be used to develop an annual budget for this work. It is recommended that a minimum of a five-year budgeting window be reviewed for developing annual capital costs to be allocated for maintenance and/or replacement of equipment. This will allow major expenses, such as chiller replacements, to occur when necessary without significant capital strain.

As an expanding and developing campus, WNCC looks to grow with purpose and considerations for the natural environment. Resource conservation, energy and water efficiencies, and indoor air quality were deemed as the most important issues to address in regard to existing and new construction. Sustainability goals for WNCC:

- 1. Renovate existing facilities to improve and monitor energy and water usage**
- 2. Build new facilities to exceed energy code**
- 3. Provide ample daylight for learning spaces**
- 4. Create indoor and outdoor healthy learning environments**

The Planning Process





Feedback

The information gathering process included seeking input from various groups. Each group provided feedback regarding their current and future outlook for WNCC.

Faculty/Staff

The teams recognized that change is inevitable and “train the trainer” is necessary. This pedagogy is changing and to reach students they need to change with it. The staff looked to embrace collaboration among divisions and community partners in order to better deliver instruction to students. They did feel that students and staff have an interest in active learning collaboration. They, like the students, had enthusiasm for the use of technology but device affordability was a concern along with the reliability of technology.

Business Community

The various business leaders believe that WNCC fulfills an important role in the community. In today’s business world, students need interpersonal skills in order to communicate with customers, but they also need to be able to use technology as a powerful tool. Due to the distance between offices students need to be comfortable with web conferencing and working remotely. Students need to have critical thinking skills with the ability to solve problems quickly and accurately. One of the strong attributes of WNCC students, is they have the ability to function immediately upon hiring, and are quick contributors without the need for additional training.

Student Observations

The students felt that WNCC is a good option for those students wanting to stay close to home as well as those looking for a good transition to a four year institution. The college provides good value given its location in the Panhandle. They would like to see more trade programs offered but were complementary of the programs currently being offered. Students believe WNCC has great faculty that are accessible. They liked the fact that, as a whole, the campus is convenient and most of their classes are in one building. The campus is also commuter-friendly with plenty of parking..

The students believe that the housing options were limited with Conestoga being the preferred residence hall as Pioneer is aging and has HVAC issues.

Goals & Objectives



Goals and Objectives

After discussions with the Executive Committee and feedback from the Visioning Workshops, several goals and objectives were identified as being the basis for the Master Plan during its development. These are as follows:

- Provide recommendations on space planning and programming that facilitate instructional learning both now and in the future.
- Provide a high level review of the current campus and facilities to identify areas of need and well as areas for increased efficiency
- Outline audio visual and technology infrastructure that will support the changing requirements of future educational pedagogy.
- Identify mechanical and electrical system modifications that will provide comfortable and efficient solutions for existing and new construction.
- Create guidelines for sustainable programs and practices that can be incorporated on campus to reduce waste and increase efficiency
- Identify signage, landscape, traffic, parking and other site design opportunities that enhance the functional and aesthetic appeal of the campus.
- Develop a phased construction timeline and project cost estimates that will serve as a guideline for master plan implementation.
- Plan and design facilities to meet the future requirements of education and student life programs
- Improve the overall student experience
- Improve pedestrian traffic flow
- Improve existing student housing
- Expand recreation facilities for students and student athletes alike
- Identify area in existing facilities for program growth in conjunction with local business or other colleges/universities
- Identify area for increased efficiencies within and between departments

Program Needs Assessment



Main Building Office Space	Staff	
	Existing	Proposed
Department		
Admissions	4	5
Academic Enrichment	9	8.5
Administrative Services	16	17
Athletics	11	12
Business	11	8
Bookstore	2	1.5
Education Services	9	12
Financial Aid	5	4.5
Human Resources	4	4
IT	7	7
Language/Arts	11.5	12
LRC	6	6.5
Math/Science/Phys Ed	14	14
Online Learning	2	2
President's Office	2	2
Public Relations and Marketing	2	4
Registrar	1	1
Social Sciences	8.5	9.5
Student Services	6	6
TRIO	4.5	4.5
WNCC Foundation	2.5	3.5
Writing Center	4	4
Totals	142	148.5

Main Building Classrooms	Capacity	Quantity	
		Existing	Proposed
General	25	13	12
General Lecture	36	0	2
Computer	25	5	2
ITV	25	2	2
Online Learning - Large	45	0	1
Active Learning	25	1	1
Journalism	12	1	1
Music	32	2	2
Practice	2	3	4
Science Lab	25	4	4
Math/Writing	40	2	1
Art	40	2	2
Testing/LRC	40	1	1
Totals		36	35

APTC Classrooms	Capacity	Quantity	
		Existing	Proposed
General	25	6	5
General Lecture	36	0	1
Totals		6	6

APTC Office Space	Staff	
	Existing	Proposed

Department		
APTC	5.5	6
Totals	5.5	6

Harms Technology Center Classrooms	Capacity	Quantity	
		Existing	Proposed
General	25	7	5
General Lecture	36	0	2
Computer	25	5	2
ITV	25	1	1
ABE Classroom	25	1	1
Totals		14	11

Harms Technology Center Office Space	Staff	
	Existing	Proposed

Department		
BCE	15.5	18
BCE (Health)	2	4
HEOC (EMT)	3	5
HEOC (Nursing)	12	14
Totals	32.5	41

FAST FACTS

Current Students (2012-2013):

- Full Time – 1,109
- Part Time – 1,171

Average age of student population: 20 years old

International Students: Over 50 students from 24 countries

Campus Housing:

- 278 student reside on campus in one of two residence halls
- 138 on-campus rooms (85% occupancy as of Spring 2013)

Programs: 89 programs of study

Athletics/ On Campus Groups:

- Over 130 Student Athletes
- 28 Student Organization on campus

Sidney - Main Building Classrooms	Capacity	Quantity	
		Existing	Proposed
General	25	5	5
General Lecture	36	0	1
Computer	25	2	2
ITV	25	2	2
ABE Classroom	45	1	1
Active Learning	25	0	0
Science Lab	25	1	2
HEOC	40	1	1
Cosmetology	40	1	1
Totals		13	15

Sidney Main - Building Office Space	Staff	
	Existing	Proposed

Department

Sidney Main Building	28	30
Totals	28	30

Staff Needs

The projected staffing needs appear to remain consistent for the next 7-10 years for a majority of the programs, however a few programs are expected to grow including Business, Nursing/Allied Health, BCE and Workforce Development. Collaboration and meeting spaces are needed to engage students and provide resources for students and faculty alike. The expansion of writing and math labs for additional engagement opportunities between student and faculty are needed. Consolidation of the various testing labs into a central location will allow for efficiency oversight of this activity as well as bring potential new students to campus.

Division and Program Assessment

Art

The Art program is divided between two classrooms which are undersized and on separate levels with no natural light. They each lack proper storage and ventilation for pottery is lacking with no on-site kiln.

Athletics

WNCC has a strong Athletic Program with 140 student athletes and National Champions in women's volleyball. Each athletic program was assessed to determine existing issues within each program.

The weight room is shared between students, staff and athletes alike with no staff observation of students which can lead to safety issues. Due to its size, the room can become quite crowded and unappealing for students when it is in use by the various athletic groups. The ceiling height limits the types of stretching and exercises that can be performed by some students.

The training room and adjacent space is small and undersized given the number of student athletes that participate in programs at WNCC. The location of the training room is not conducive to overseeing athletes going through treatment because there is no privacy for students during these sessions. The lack of adequate space is a concern. Storage is inadequate for the supplies needed to serve the athletes at WNCC. Currently there is not gathering or lounge space for athletes before or after practice.

The lockers rooms that serve the men's and women's basketball teams are out of date and undersized and they are shared with other sports that practice within the Main Building. There is only one gymnasium and court that is shared between teams and students which causes sched-

uling conflicts. The gymnasium space is adjacent to classrooms which can lead to noise and interference between these two functions depending on the time of day.

Due to the lack of space and fields, the baseball, softball and soccer all play at fields and facilities off-campus. These facilities are shared with others in the community. They lack proper on-site amenities including lockers rooms and lights. They also require the students to leave campus everyday for practice. The soccer team utilizes an indoor skating rink for its indoor training facility due to the lack of space on campus.

English/Reading/Foreign Language/ Humanities/Journalism/Social Science

Currently most classes are 24 students or fewer with the average number being closer to 18. The faculty has made a commitment to sharing classrooms for efficient scheduling. After the visioning workshop they were enthusiastic about the active learning environments but stated that it was all contingent on reliable technology

Health (AD-N/PN/HIT/Allied Health)

Current discussions with UNMC College of Nursing are an opportunity that may be realized soon. In order to increase efficiency between groups, the co-location of Nursing and Allied Health might be a benefit along with coordinated efforts with Business and Community Education for shared spaces and classrooms. These areas of study are trending toward more simulation which requires additional space and infrastructure. As with other groups they were enthusiastic about Active Learning environments and saw potential for growth in the programs (Scottsbluff, Sidney and Alliance).

Music

The award winning Music program is located behind the theater along the backside of the stage. Due to the footprint of the Main Building and the departments location, the space is inadequate for this program. The spaces that are currently being used have poor acoustical separation causing sound transmittance into the corridor and adjacent spaces. Currently there are limited practice and office spaces forcing students into the adjacent hallway which doubles as a storage area for both the music and theater departments. With this limitation, proper storage for equipment and uniforms is missing.

Theater

The renowned Theater program shares the eastern portion of the Main Building with the Music program. This current space offers no fly space, side stage or receiving areas. The shop for set and prop creation is located off stage and provides limited space for construction of these items. Overall storage is undersized and inaccessible at times. Dressing and green rooms are dated and undersized given the size of productions at the facility. The performance of the space is lacking in terms of acoustics, lighting and overall appearance. The cloth seating is original along with the carpet which is showing signs of wear. The size and configuration of the stage limits the type of productions that are able to be produced in its current configuration. The existing corridor that encircles the theater is used for pre-function activities as well as circulation to and from the theater. New visitors have difficulty locating the theater entrance.

Workforce Development (WFD)

Currently the WFD is housed in the south bay in Harms building and is adjacent to other program spaces. The current space has issues with a ventilation system conducive to running gas/diesel equipment indoors. This also leads sound issues between the open area and classrooms and labs. The current space lacks storage for sensitive simulators/equipment. The south bay does not have broadband internet bandwidth and is unable to accommodate a number of devices at one time. Many users have web-based systems and bring their own devices due to this issue.

Eventually an exterior concrete pad and dirt area with training tower, rappelling wall (two sided to be able to rappel indoors also), helicopter pad, and full scale hydrant will be needed for expanded program offerings.



Facility Needs Assessment Summary



Facility Needs

Applied Technology Building

The APTC building has an adequate number of classroom and faculty offices and that additional space is needed for program expansion and circulation issues.

There are several issues that were identified by staff during inspections as well as in the 2012 FCA. Currently students cannot access the restrooms without passing through the Welding area which creates a safety concern. This also limits the ability to lock-off or close portions of the building separately which is a safety issue. The current auto body shop uses a paint booth for the application of solvent based paints. This technology is no longer be used in body shops thus making this an antiquated approach. There is also insufficient space in and around the paint booth thus making it difficult to move in and out of this area. Located next to the paint booth is the air compressor which supplies all air powered tools for the shop. This compressor is quite loud and muffles the voice of the instructor during class. Tool and material storage is lacking and additional space is critical for safe and efficient instruction.

Other issues identified include on-going mechanical and electrical issues identified in this report as well as in the 2012 FCA.

Bishop Dining Hall

The Bishop Dining Hall is located adjacent to Pioneer Residence Hall and was remodeled in 2008. In its current configuration the ability to monitor when patrons go to the restrooms is difficult which allows them to bypass the register. The space is configured for seating for 120 at round tables and high tops. There is a lack of booth seating. The serving line was designed as a single line service. The delivery dock is steeply sloped and configured in a way that makes deliveries awkward.

Bookstore

The Bookstore is tucked alongside the gymnasium adjacent to the Den dining area. This leftover space from Gym renovation is long and narrow with a curved wall and lacks proper storage. It has no daylight and is completely removed from the flow of student in the Main Building. The Den closes at 2:00 and the students no longer pass by as it is not a destination. It offers books, school supplies, art supplies, and clothing but does not offer printing services. It is open during games but due to its location the amount of foot traffic is small. There is no dock adjacent to this space which forces packages through the building to the area within the bookstore, making deliveries difficult.

Child Development Center

Based on conversation with the Executive Committee, no space analysis was performed of this facility

Clark N. Williams Multicultural Learning Center

Currently the facility meets program needs; reconfiguration would be required to accommodate a different program in the future.

Den

The Den is located on the first level of the Main Building and is adjacent to the gymnasium and Bookstore. It serves a limited menu and is operated with limited hours. The location is not conducive to extended hours and the operational costs cannot be justified. There is a lack of space with no storage in its current location which also causes operational conflicts with Bookstore.

Harms Advanced Technology Center

The facility requires additional offices needed for faculty that is added as part of the UNMC and BCE programs. Currently it has an adequate number of general classrooms

that can be shared between programs. As part of the program expansion, the creation of labs dedicated for UNMC program is needed to account for these new offerings. Additional storage is needed for Workforce Development and Allied Health, which can be provided by reconfiguring existing space.

LRC

The Learning Resource Center is located on the second level of the Main Building. It is configured as a typical library with stacks, tables and seating. There is no flexibility in the current space to plug in a laptop. Wireless access is also limited. The desktop workstations take up a large foot print in the space and reduce the flexibility. Occasionally there is testing that occurs within the LRC and concern for noise due to the openness in the space. The age of a student at WNCN varies, with the older generation wanting quiet space while the younger generation prefers more collaborative space. While the LRC offers access to computers, many of the older students need training in the use of technology and prefer a place where this can happen away from other students. The Math and Writing labs have been successful and better access to students is desired.

Main Building

The Main Building has a surplus of computer classrooms. These rooms should be converted to general use classrooms to offer greater flexibility in use and configuration. Currently there are an adequate number of general purpose classrooms, science classrooms and lecture and active learning classrooms. Additional faculty offices are needed to accommodate current staff and future growth based on the analysis provided.

Both student and education service department have several redundancies within each departments in terms of

storage and support spaces due to their current locations. The layout and configuration of the spaces leads to poor way-finding and identification of current spaces. The analysis showed underutilized student spaces due to hours of operation or location in conjunction with student circulation paths. Several spaces have a lack of identity and sense of place which causes students to leave the facility versus staying on campus. Most classrooms are windowless and are without views to the outside or natural light.

North Shed and Maintenance building

Based on conversation with the Executive Committee, no space analysis was performed of this facility

Student Services

The current Student Services is located on the west side of the Main Building adjacent to the main lobby. Not all services are located in this location with related programs spread throughout the Main Building as well as other buildings on campus. Due to the location of the Student Services, the enrollment process and accessibility to staff are difficult. A consolidation of offices to serve both new and existing students.

Residence Halls

Pioneer Hall

Pioneer Hall has an adequate number of residence rooms (90 beds), however upgrades need to be performed to meet accessibility issues, to provide amenities consistent with peer institutions, as well as those repairs identified in the FCA Report.

Conestoga Residence Hall

Based on conversation with the Executive Committee, no space analysis was performed of this facility



SIDNEY NEEDS AND ASSESSMENT

Existing areas of the current building including classrooms and labs do not function well for their intended use. The main conference space experiences significant community use throughout the day for seminars and training. The program spaces for Science, Nursing and Cosmetology are in need of expansion, renovation or remodel. The Science classroom lacks proper storage and demonstration space while the Nursing lab's configuration has potential security issues with an outside door. There is no observation room for simulations. The Cosmetology lab needs new casework, expanded storage and a redesigned reception area to better serve its customers and to provide students the proper facilities and tools for their training. The Learning Resource Center (LRC) area is adequate but its current configuration does not allow for maximum space usage. As more books move to digital form, the need for physical book storage is diminishing. The building lacks a true student collabora-

tion space as the current one is undersized and shares adjacent space with faculty offices. The office and administration area are sized appropriately but are missing a clear line of delineation between reception/student space and office space thus students are passing through areas that should be designated office space. This can lead to issues with privacy and the sharing of delicate information inadvertently.

Airport

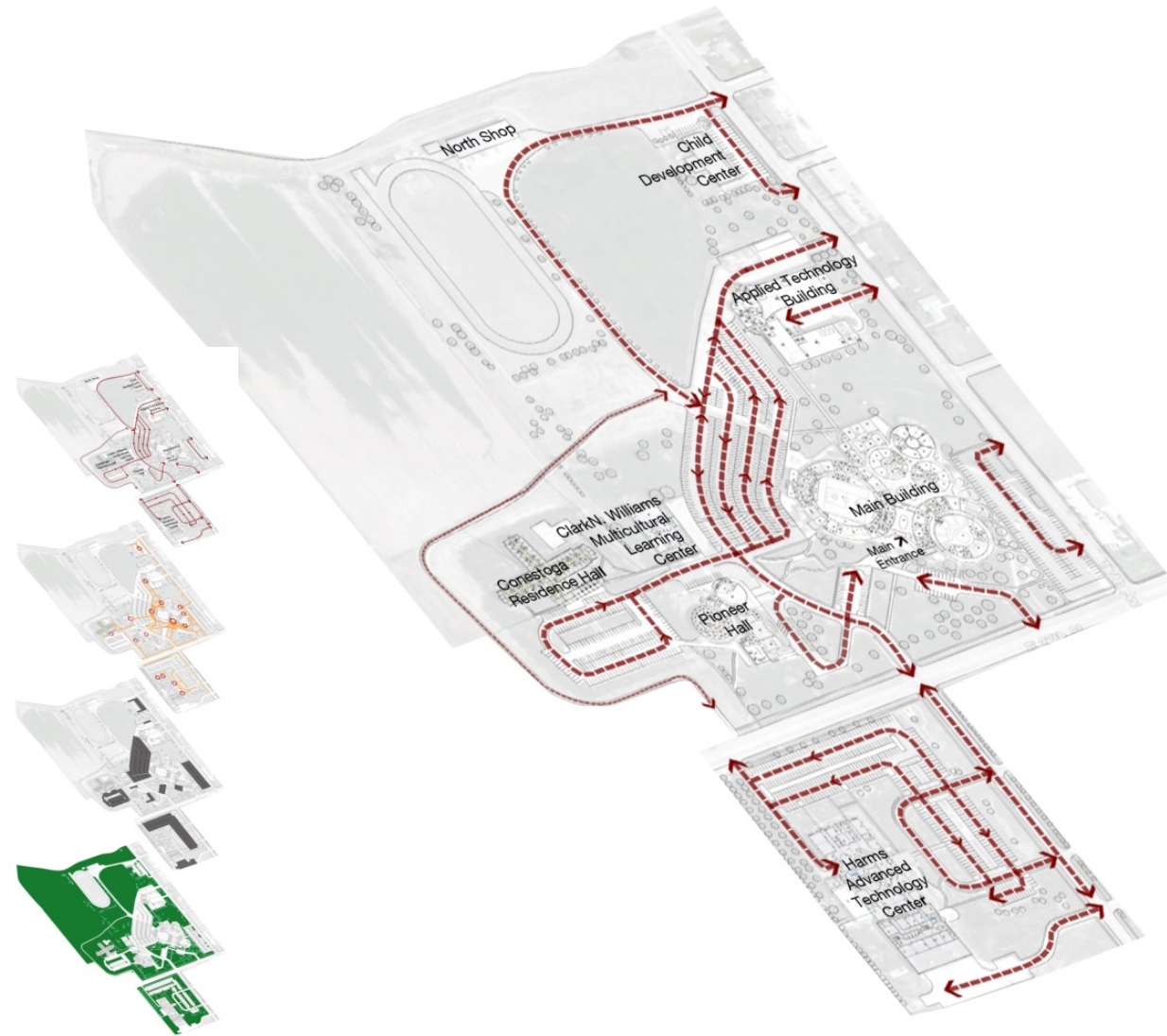
The airport building currently does not have a proper paint booth. Current painting is done in a make-shift area.

Housing

There currently is no on-site housing at the Sidney campus, though a majority of students attending the college are from out of town.

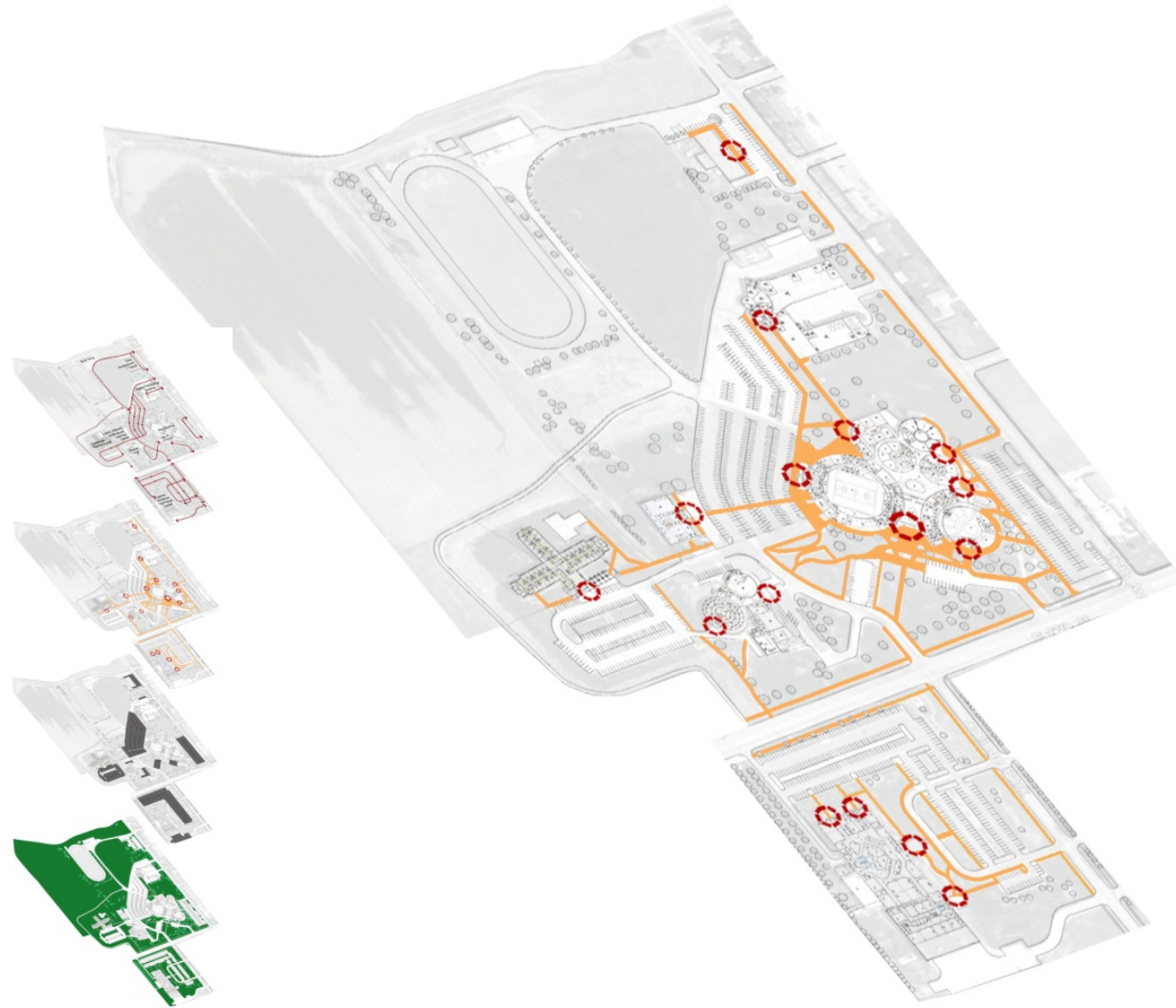
Campus Analysis





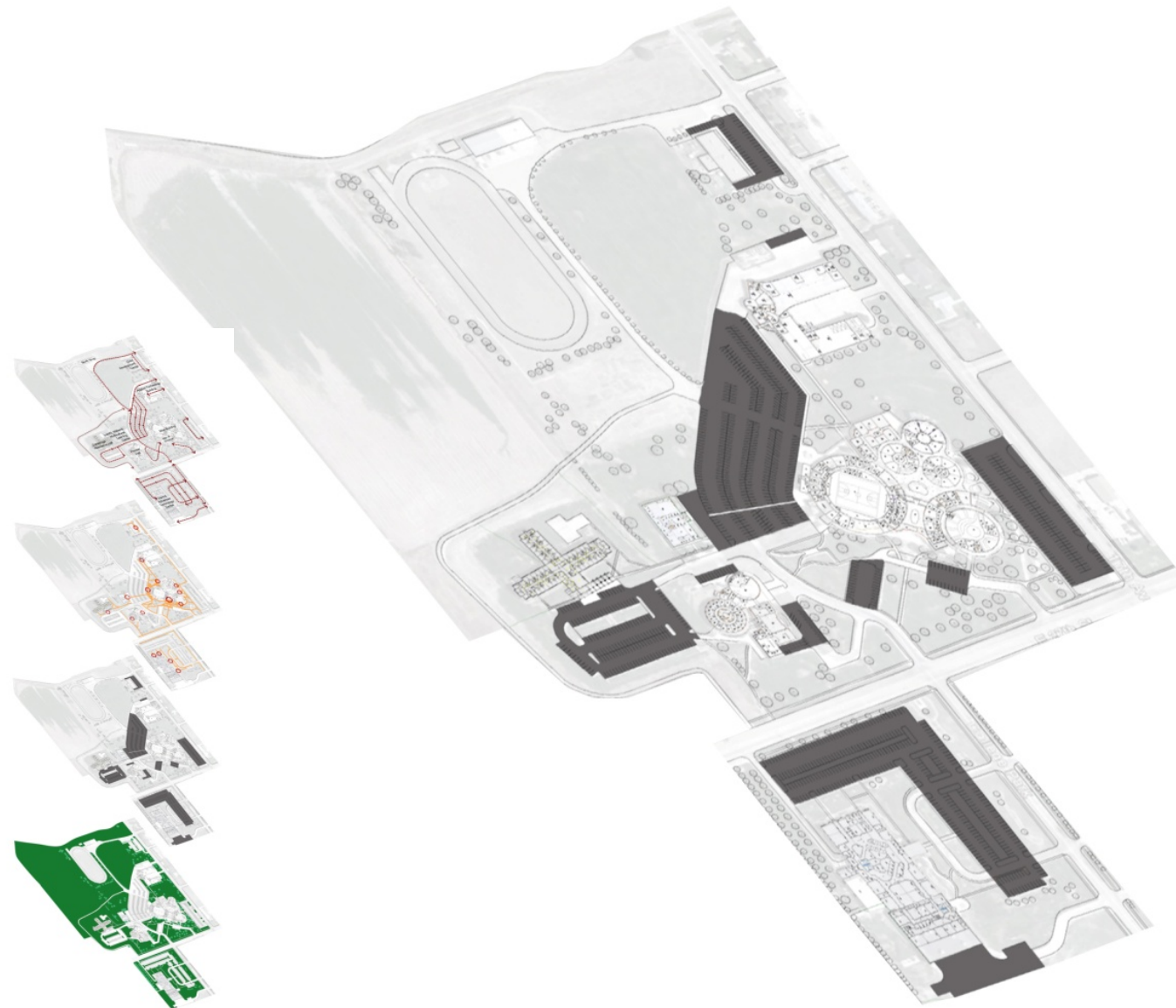
TRAFFIC PATTERNS / CIRCULATION

Traffic Patterns / Circulation on campus is vehicular oriented. Most of the traffic to and from campus utilizes E. 27th Street from the west and College Park from the south. On campus, circulation through the main entrance leads past Pioneer Hall and into large parking lot. Once in this parking lot, circulation begins to break down due to a lack of structure within the lot, creating a number of conflict points with pedestrians.



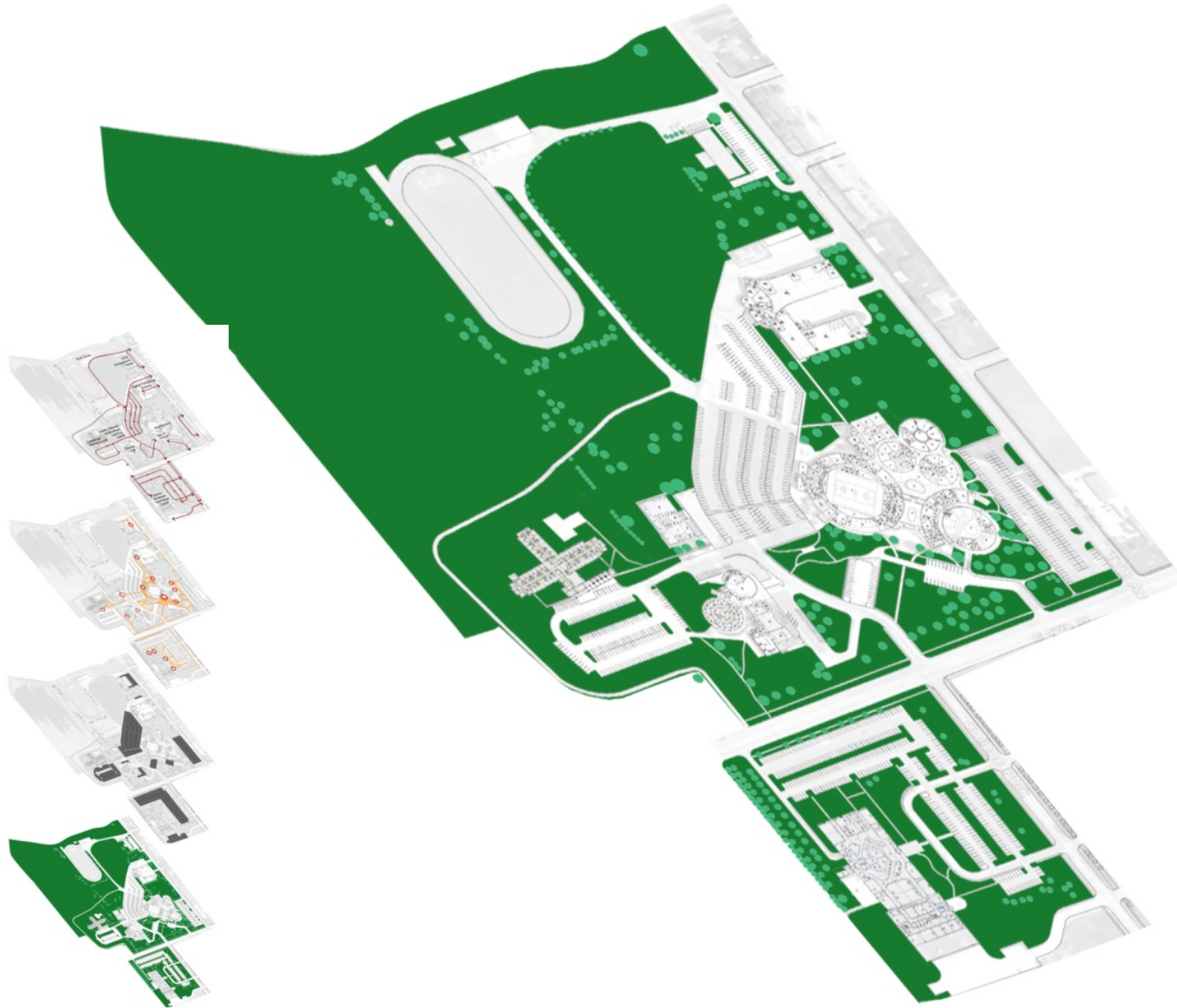
PEDESTRIAN CIRCULATION

Pedestrian Circulation on campus has taken a back seat to accommodating vehicles, creating a disjointed and conflicted circulation pattern. Many pedestrian routes between the campus buildings require the pedestrian to cross drives and parking lots. Pedestrian access to the Harms Center from main campus is tenuous at best. Pedestrians have to cross a busy 27th Street that contains no signalized crossings through this section of the corridor.



PARKING ON CAMPUS

Parking on campus is adequate for the campus needs. The newly finished east parking lot is an improvement over the previous parking lot in this location, creating an efficient and safe parking lot. The main lot, NW of the Main Building is congested and has many conflict points with pedestrians. The Harms Center lot is underutilized, with the north portion of the lot rarely full. Currently Western Nebraska Community College has 1,068 vehicular parking stalls on campus, with 746 stalls located on the Main Campus and 322 stalls at Harms.



OPEN SPACE

Open Space is abundant, but not highly accessible. The campus lacks a well defined, high quality outdoor space for students, faculty and staff. The current intramural field is of good size and quality, but lack amenities for the participants. Due to the climate, most of campus is irrigated. This is an expensive and unsustainable approach to the campus open space.

Campus Master Plans





LAND USE

The master plan recommends the following guidelines in regards to the Land Use of the campus. The four primary zones for the campus are:

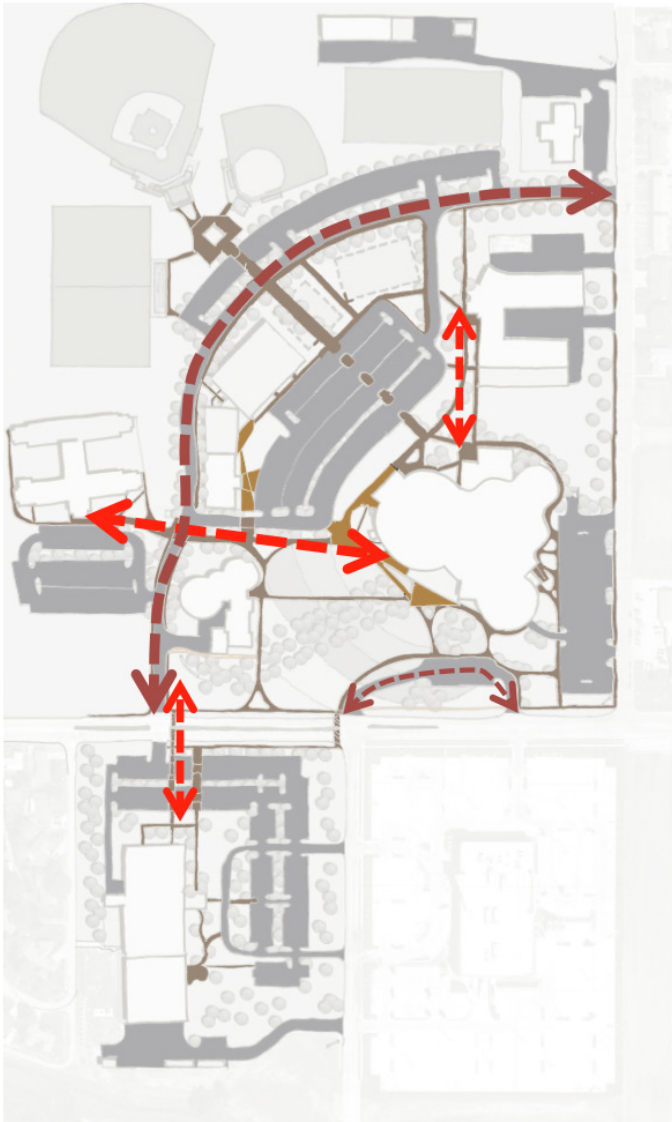
- Academic
- Student Life
- Athletics
- Management/Operations

The Academic Core of campus is located at the Main Building. Additional academic space is at the APTC and Harms.

Student Life services are focused on the two residence halls, Conestoga and Pioneer, as well as the Bishop Dining Hall.

To accommodate the Athletics programs needs, the Master Plan recommends that the Williams Center be converted to a new Athletic Training Center. This new facility would be the first of three planned facilities for athletics. The master plan also designates space on campus for competition athletics to move onto campus, if the college so desires.

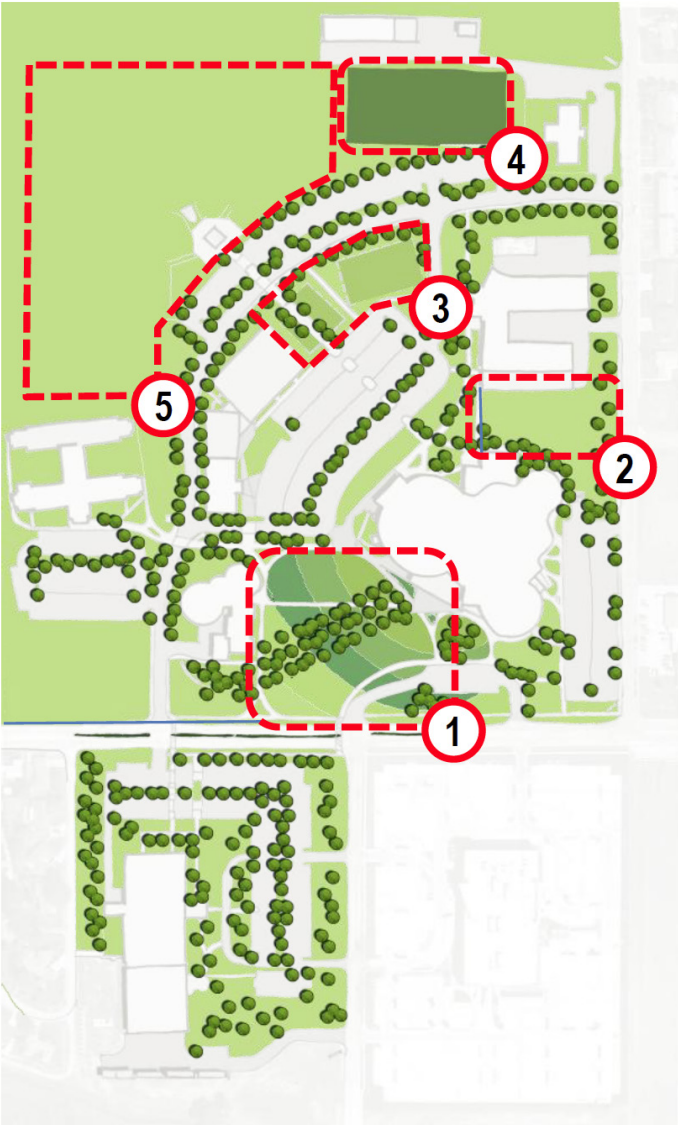
Maintenance/Operations remains in its current location with the addition of a new bus barn and new maintenance shed to replace the one displaced by the new athletic fields.



CIRCULATION

Vehicular Circulation on campus is recommended to be re-organized in a way that moves the primary route of travel around the perimeter of campus. This removes a number of vehicular / pedestrian points of conflict. Secondly, this creates a clearly defined entrance and edge to campus, allowing visitors to see the entrance and the campus beyond as the travel east along 27th Street. A reconfigured visitor and short term parking at the new front entrance to the Main building maintains a sense of welcome.

Pedestrian Circulation on campus will be organized in a way to allow pedestrians to move more freely through campus, with designated routes with minimal parking and driveway crossings. The creation of a wide pedestrian boulevard between Main and Conestoga Hall, with a connection to Pioneer Hall will provide a strong link between the academic and the student life services on campus. An improved crosswalk across 27th Street will allow for safer travel between the main campus and the Harms Center.



OPEN SPACE DESIGNATION

Open Space for a college campus is critical to overall structure of life on campus for students, faculty and staff. The master plan recommends the organization of the campus open space in a way that reinforces the collegiate atmosphere, encourages a walkable campus and provides special moments on campus currently not found.

The key recommendations for Open Space are:

- 1. Development of a formal Campus Green between Main and Pioneer Hall.
- 2. A passive green space between Main and APTC – to be held for future building sites.
- 3. Open space adjacent to the new Indoor Turf facility.
- 4. Reorganized recreation fields to accommodate new parking and work with the proposed athletic venues.
- 5. Passive, minimally maintained open space in the northwest portion of the campus. Space is designated for competition athletic venues in the future.

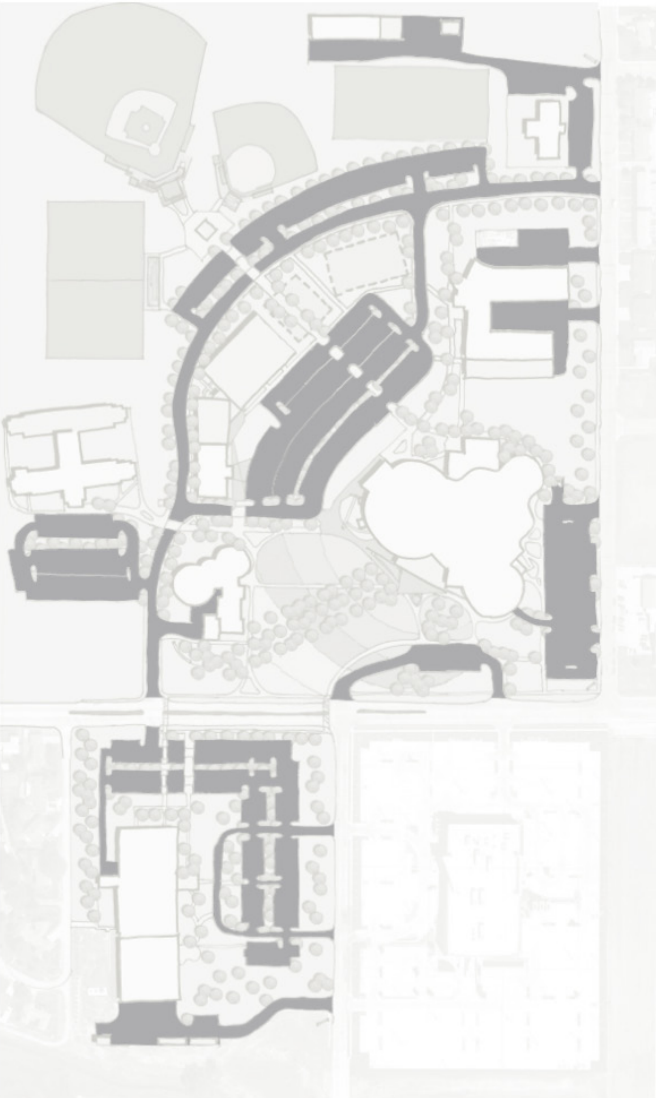


POTENTIAL BUILDING SITE

Potential Building Sites in the master plan are shown in several locations. These are a mix of building additions and new buildings. These new facilities are aligned with program needs and wants discovered during the master plan process. These include:

- A. Main Building New Entry
- B. Main Building New Theater Lobby
- C. APTC South Addition
- D. Practice Gymnasium
- E. Indoor Turf Facility
- F. Conestoga Hall Addition
- G. Bus Barn
- H. Covered Fleet Vehicle Parking

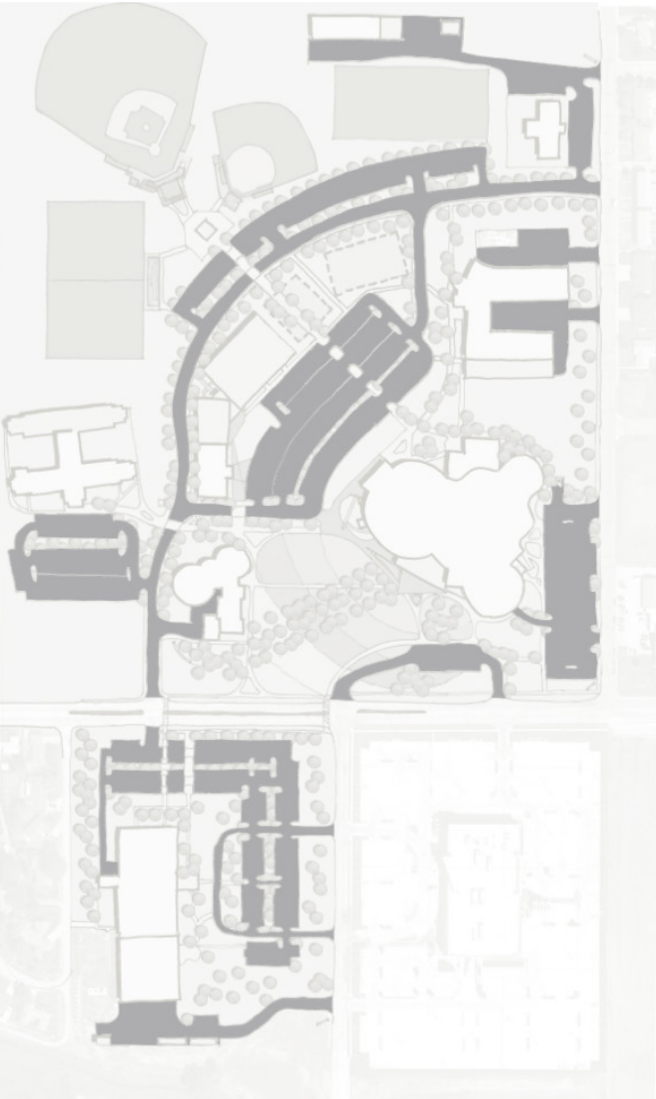
The master plan also denotes the locations for future buildings (numbers 1 & 2), if and when they become necessary. These building locations are to be maintained as open space until such a time.



PARKING

As a way to identify parking demand on campus, a simple analysis of FTE and total enrollment numbers will illustrate parking trends and help inform decisions on parking demand. Currently there are approximately 1,600 full time equivalent (FTE) students on campus. Over the past several years the total FTE enrollment has held relatively consistent.

Total student enrollment (part and full time) is approximately 2,280 students for 2012. When comparing the total FTE and total enrollment, a FTE to total enrollment ratio of 1.43 is yielded, which indicates a high percentage of the students on campus are staying on campus for a longer period of time. Typically a ratio of 4 or more would indicate a higher turnover with students staying on campus for a shorter periods of time. A higher ratio does not require more parking spaces, but does require strategic class loading to avoid “peaking” on campus.



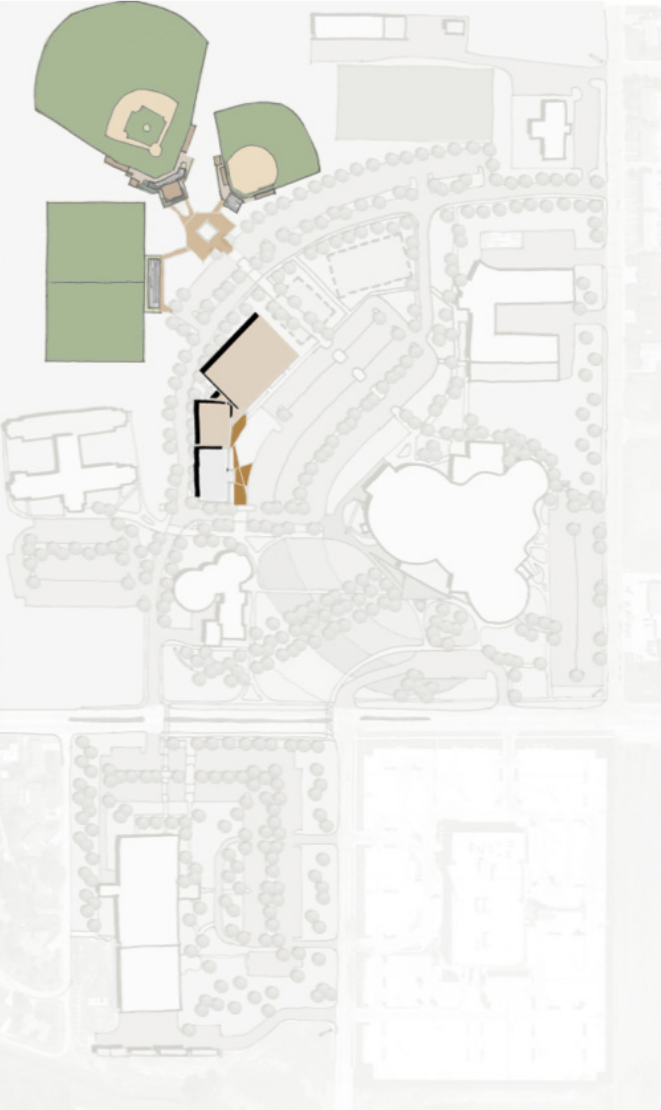
PARKING

WNCC has stated they plan for student demographics to hold consistent for the next several years. The total parking space per student enrollment is .46 (1,068 / 2,280). The total parking space per FTE is .67 (1,068 / 1,600). National standards for parking space to FTE vary greatly, but generally fall in the .25 - .35 range for acceptable access to parking.

In addition to the FTE's on campus, there are approximately 146 total faculty, staff and administration which slightly increase parking demand for a total demand ratio of .61 - still well above national standards.

Based on the above statistics and acceptable standards, current parking on campus should be more than sufficient to meet the demands of campus. A reduction in approximately 200 stalls would still yield an acceptable ratio of .5 for combined staff and FTE.

While a reduction in parking may be acceptable, the master plan recommends that the parking be reorganized to push it more to the edge, allowing for more green and open space adjacent to the buildings. The parking lots should also incorporate sustainable stormwater practices and landscaped islands to provide human comfort to the large paved areas.



ATHLETICS

Cougar Athletics is a major component to the success of WNCC. The master plan recommends a number of facility enhancements and creation of new facilities strengthen the ability of WNCC to recruit student athletes. By moving most of the athletics away from Main to a renovated Williams Center, this gives both the academics and athletics a bit of breathing room. The 10,000 SF Williams building will accommodate the following program items

Athletics Offices	1,400 sq. ft.
Locker Rooms	2,250 sq. ft.
Athletic Training	1,100 sq. ft.
Weight Room	2,400 sq. ft.
Baseball/Softball Cages	2,250 sq. ft.

Future development of a practice gymnasium will allow men’s & women’s basketball and women’s volleyball to have additional practice space.

A future indoor turf facility is seen as an opportunity to allow year round training for multiple sports and be an asset to the community as a whole.

The northwest quadrant of campus has been designated as the potential home for competition Softball, Baseball and Soccer venues, if WNCC should wish to move those venues on campus.

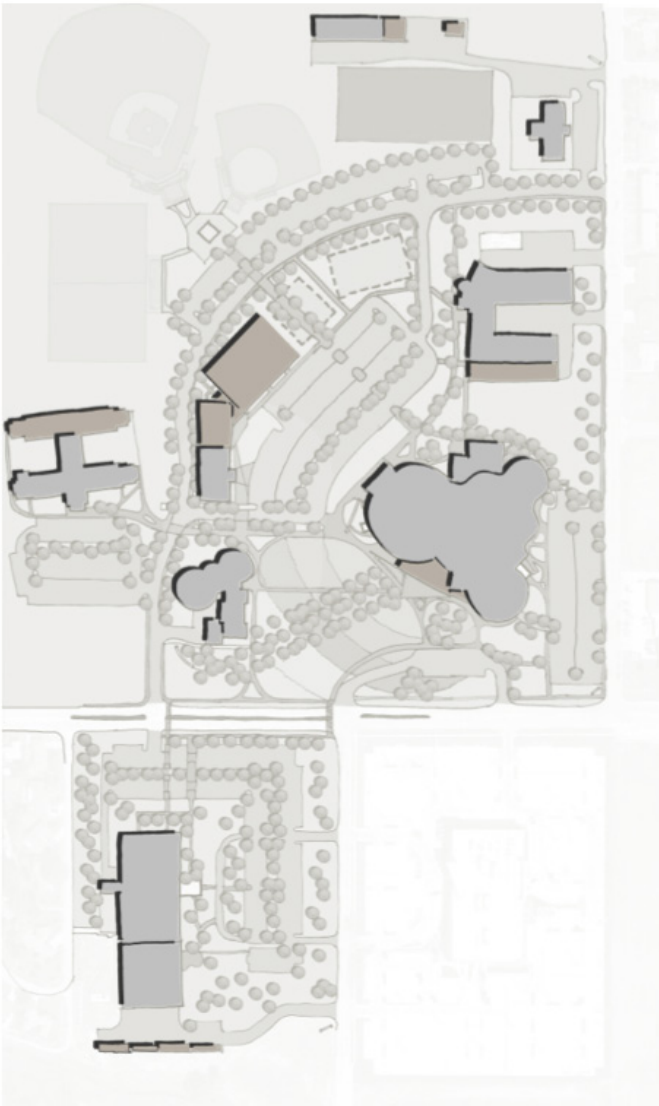


MAIN CAMPUS NORTH

The Main Campus North area recommendations include a number of major and minor improvements. The new ring road (9) will drive many of the other recommendations. The new campus entry, along with the development of a new entry and plaza at Main and the campus green will transform ones first impression.

The creation of an Athletics Complex, starting with the renovation of the Williams Center building will strengthen WNCC athletics as a key recruitment tool for the college.

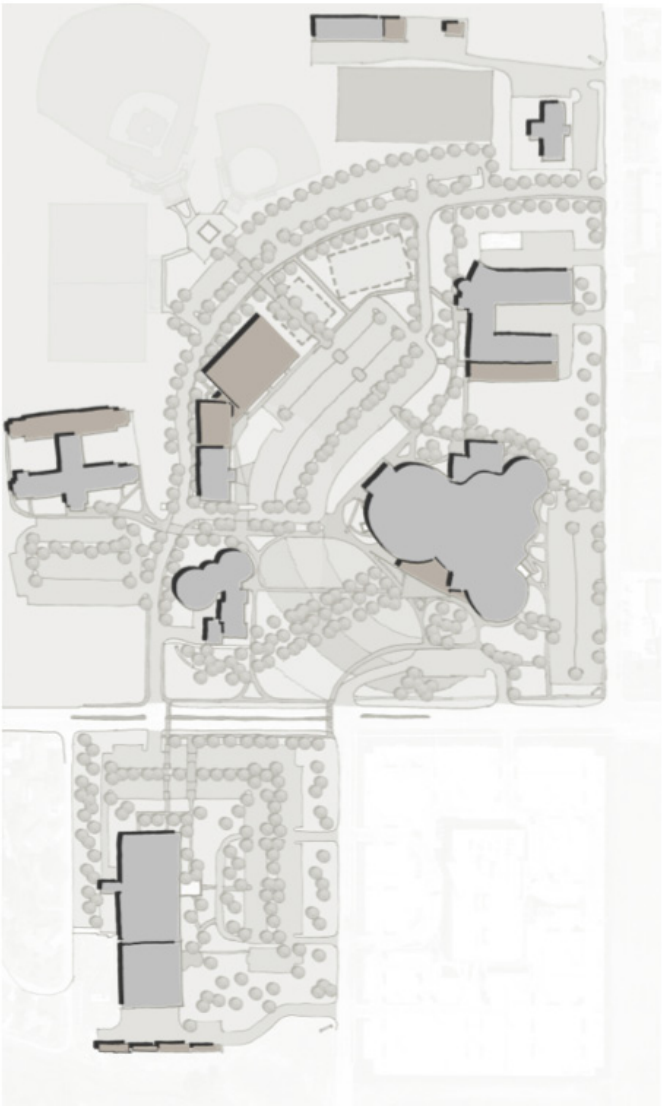
New building entrances, established green spaces and re-organized and "green" parking will provide students, faculty and staff members a renewed sense of the college campus, allowing for more movement in and around campus on foot or bike and less reliance of utilizing one's vehicle to get around.



BUILDING GUIDELINES

Ensuring that the campus is not over built, the master plan recommends that a maximum floor area ratio (the ratio of total gross square feet of buildings divided by the overall square footage of the site) of no more that 0.25. The proposed master plan includes several additions, several new facilities and two potential long range building locations has a FAR of 0.18.

- Existing GSF = +/- 442,000
- Planned additional GSF = +/- 20,000
 - » Main Building - Southwest Addition
 - » Main Building - Theater Entrance
 - » Applied Technology Building - Paint Booth Addition
- Long-Term Potential Building Site GSF = +/- 51,000
- Maximum Master Plan Building Area = +/- 585,400 GSF
- Campus Land (acres) = +/- 78 acres (+/- 3,400,000 SF)
- Floor Area Ratio = 0.18

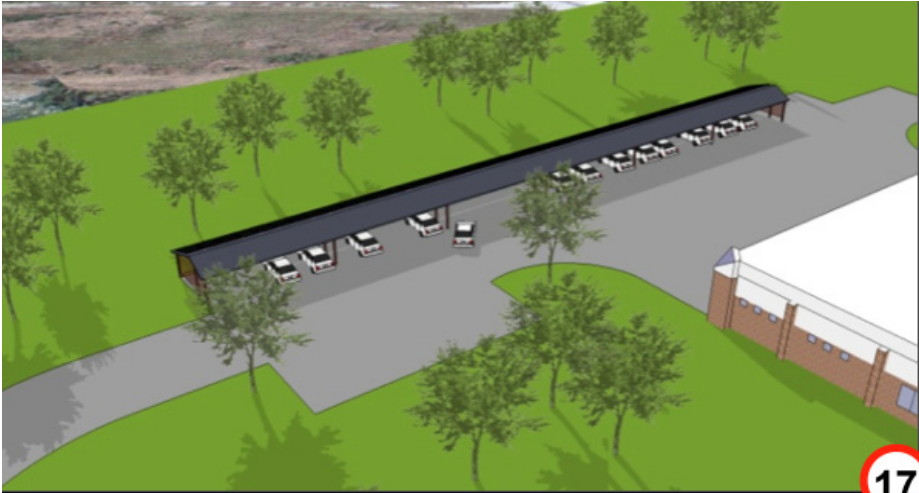


BUILDING GUIDELINES (CONT')

Massing of all additions and new facilities should be in scale with the existing architecture on campus. The master plan does not recommend the use of circular buildings for future building massing, but that new facilities and additions respect the forms and massing of the original buildings on campus.

Building Height should be consistent with existing buildings, with no more than three stories in overall height. Some building uses may dictate a taller structure (e.g. Indoor Turf Facility). These structures should be designed in a manner that does not over-emphasize the height of the facility.

- 1 Main Bldg
- 2 Applied Technology Bldg
- 3 Bldg Addition
- 4 Pioneer Hall
- 5 Conestoga Hall
- 6 Harms Center
- 7 Child Development Center
- 8 New Athletic Training
- 9 Ring Road (College Drive)
- 10 Campus Green (Quad)
- 11 Campus Icon
- 12 Campus Gateway/Sign
- 13 Intramural Field
- 14 Future Sports Complex
- 15 Enhanced Parking
- 16 Future Parking
- 17 College Fleet Covered Parking
- 18 Future Bldg Locations
- 19 Pedestian Walkway
- 20 Main Bldg Additions



MAIN CAMPUS SOUTH

The Harms Center campus area recommendations include the addition of a secondary monument sign, covered parking for fleet vehicles and an improved entrance experience into the building.



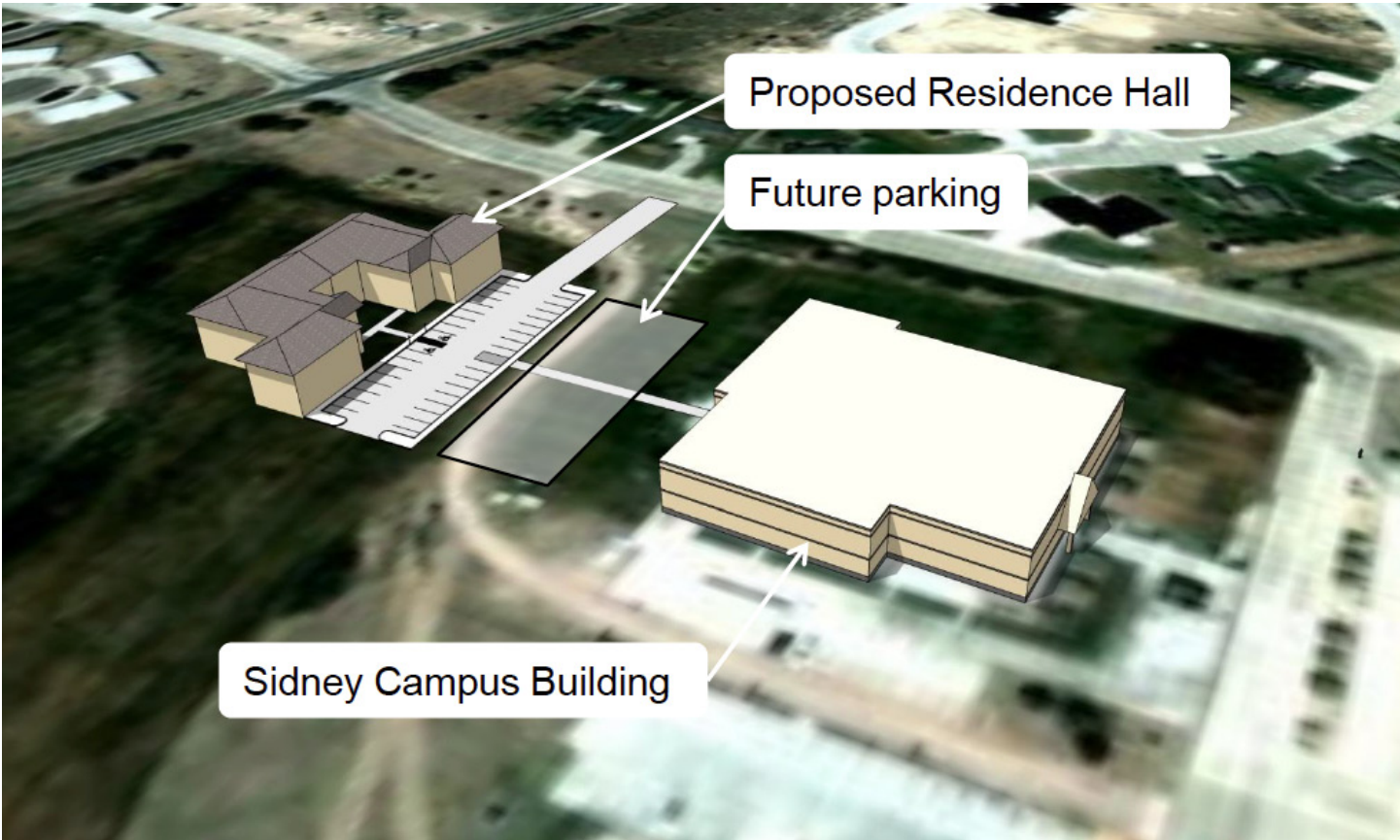
LANDSCAPE DESIGN GUIDELINES

Landscape on the campus of WNCC is currently loosely defined and without structure. The master plan recommends that a full landscape master plan be done in the future. Guidelines for future landscape improvements include:

- Use of native or adaptive species. This would include:
 - » Shade, ornamental & evergreen trees
 - » Evergreen & deciduous shrubs
 - » Perennials, grasses and groundcovers.
- Implement landscape features that allow for xeriscaping.
 - » A style of landscape design requiring little or no irrigation or other maintenance, used in arid regions.
- Limit irrigation to key landscape areas.
 - » New Campus Green
 - » Intramural & Athletic Fields
 - » Primary building entrances
 - » Campus edge along 27th Street & 17th Avenue
 - » Gateway Monuments
- Utilize standard materials & furnishings for campus
 - » Pedestrian & vehicular lights
 - » Benches
 - » Trash & recycling containers
 - » Pavement types (e.g. concrete, pavers, stones)



- | | |
|-----------------------------|---------------------------------|
| ① Main Bldg | ⑪ Campus Icon |
| ② Applied Technology Bldg | ⑫ Campus Gateway/Sign |
| ③ Bldg Addition | ⑬ Intramural Field |
| ④ Pioneer Hall | ⑭ Future Sports Complex |
| ⑤ Conestoga Hall | ⑮ Enhanced Parking |
| ⑥ Harms Center | ⑯ Future Parking |
| ⑦ Child Development Center | ⑰ College Fleet Covered Parking |
| ⑧ New Athletic Training | ⑱ Future Bldg Locations |
| ⑨ Ring Road (College Drive) | ⑲ Pedestian Walkway |
| ⑩ Campus Green (Quad) | ⑳ Main Bldg Additions |



THE SIDNEY CAMPUS

With the support of corporate partners such as Cabela’s and the hospital system, the Sidney Campus will continue to provide programs related to health sciences, science, cosmetology, general education. Long term facility needs include:

- Selective renovation of the existing building.
- Construction of a new residence hall and associated parking
- Minor renovation of the Aircraft Maintenance
- Building and the relocation of the Scottsbluff campus paint booth to the Sidney Airport facility

The Sidney Campus looks to expand to include much needed housing. The logical expansion of the campus for housing is to the west. Phase 1 would include beds for 50 in an apartment style layout, parking and a meeting room for 150 people. Phase II would expand the beds from 30 to 60, with additional parking, as needed.



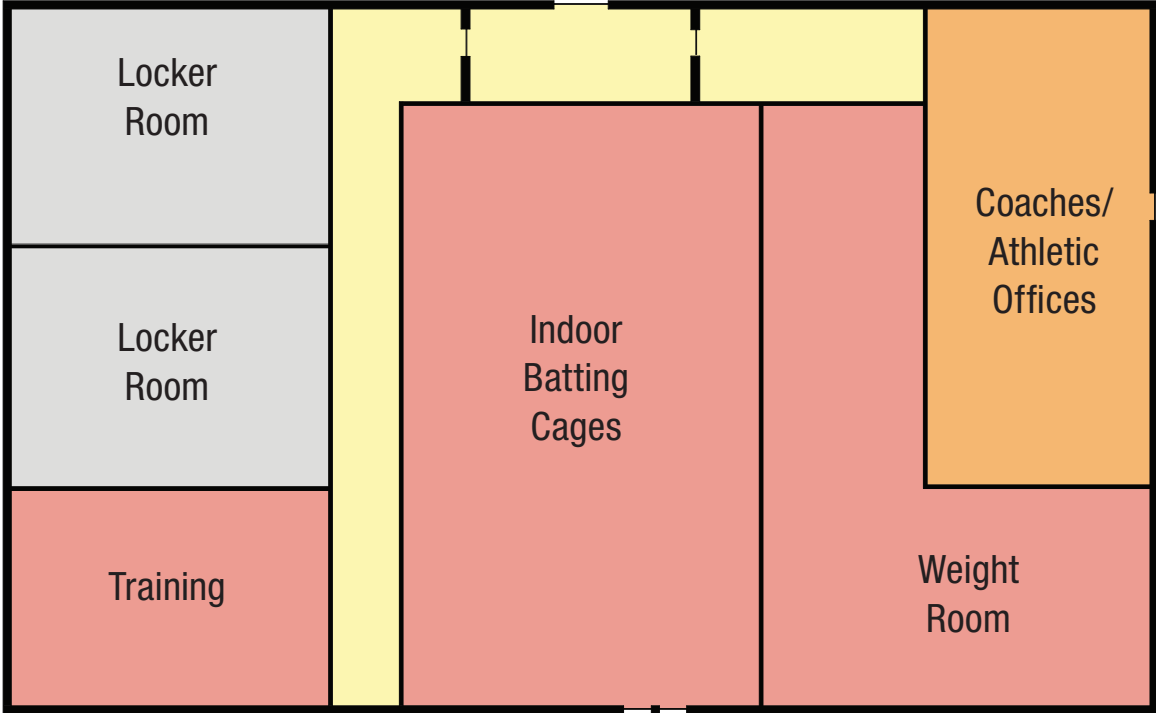
 Classroom	 Student Services	 Offices	 Academic Affairs
 Active Learning	 Registrar - Financial Aid	 Campus Services	 APTC - Nursing - Allied Health
 Lab	 President - Foundation	 Public Space	 BCE
 Athletics	 Business Office	 IT	 Arts
 Support	 Admissions	 Resident Life	 LRC

APPLIED TECHNOLOGY BUILDING

The Applied Technology Building has several upgrades or renovations needed in order to properly serve the students and faculty who occupy this building. A new entrance addition with restrooms allow students access to restrooms without passing through other areas of the building. This increases security for the facility, allowing portions not in use to be locked off. As part of this addition, new working bays for the auto body program will be provided along with a new paint booth and mixing room which will use waters soluble paints versus solvent based. This provides a better environment, while training students on equipment that is being used in the workplace. The new paint booth would allow the existing paint booth to be reused at the Sidney Airport campus as part of the aviation program. The compressor will then be moved to a separate area where the noise could be controlled. Additional parts and tool storage would also now occupy the area currently used by the paint booth.

Refer to the Systems analysis for recommended upgrades to the building's systems.

*2012 Facilities Condition Assessment Report identified exterior renovation items that are not reflected in the Master Plan cost estimate, however the item may be addressed in conjunction with the interior renovations for cost efficiency. All interior spaces scheduled for remodel or renovation will address system issues identified in the 2012 FCA report. See Appendix B for the recommended systems upgrades.



■ Classroom	■ Student Services	■ Offices	■ Academic Affairs
■ Active Learning	■ Registrar - Financial Aid	■ Campus Services	■ APTC - Nursing - Allied Health
■ Lab	■ President - Foundation	■ Public Space	■ BCE
■ Athletics	■ Business Office	■ IT	■ Arts
■ Support	■ Admissions	■ Resident Life	■ LRC

CLARK N. WILLIAMS MULTICULTURAL LEARNING CENTER

The existing student services programs will be relocated to a consolidated Student Services Suite in the Main Building, freeing up space for future programming opportunities.

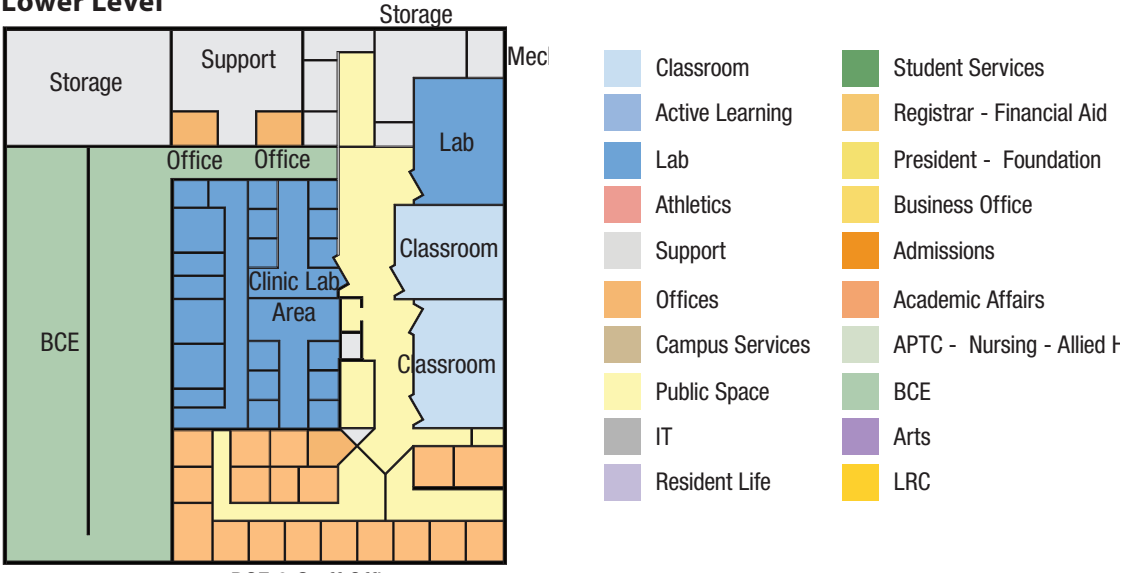
The Clark N. Williams Multicultural Learning Center is master planned to serve as the future location of the Athletic Department including Coaches, Trainers and Media Offices as well as a weight room and indoor batting cage.

A new indoor practice facility and practice court is master planned adjacent to this facility. This facility will allow WNCC teams the ability to practice without having to be in the Main Building or off campus.

An Athletic Complex is envisioned to consolidate all athletics on campus as well as providing opportunities for program collaboration with the City of Scottsbluff. This includes the creation of a baseball, softball and soccer field complex which will serve as home field for their respective sports.

*2012 Facilities Condition Assessment Report identified exterior renovation items that are not reflected in the Master Plan cost estimate, however the item may be addressed in conjunction with the interior renovations for cost efficiency. All interior spaces scheduled for remodel or renovation will address system issues identified in the 2012 FCA report. See Appendix B for the recommended systems upgrades.

Lower Level



HARMS TECHNOLOGY CENTER

The renovation and expansion of the HEOC labs and storage areas will provide the proper area need for the simulation equipment as well as other needed materials.

The relocation of the Allied Health to the Nursing instructional area will allow for greater cohesion between the two programs. The existing Allied Health would be renovated to general classroom space.

The potential co-location of University of Nebraska Medical Center Nursing programs on the campus of WNCC may provide the opportunity to reconfigure and reassign the lower level high bay space for creation of classrooms reassigned to UNMC along with the creation of nursing skills labs, simulation suites, offices and support/storage. The relocation of the Discovery Lab will allow for the construction of an UNMC office suite on the first level to house the increased staff for this new program.

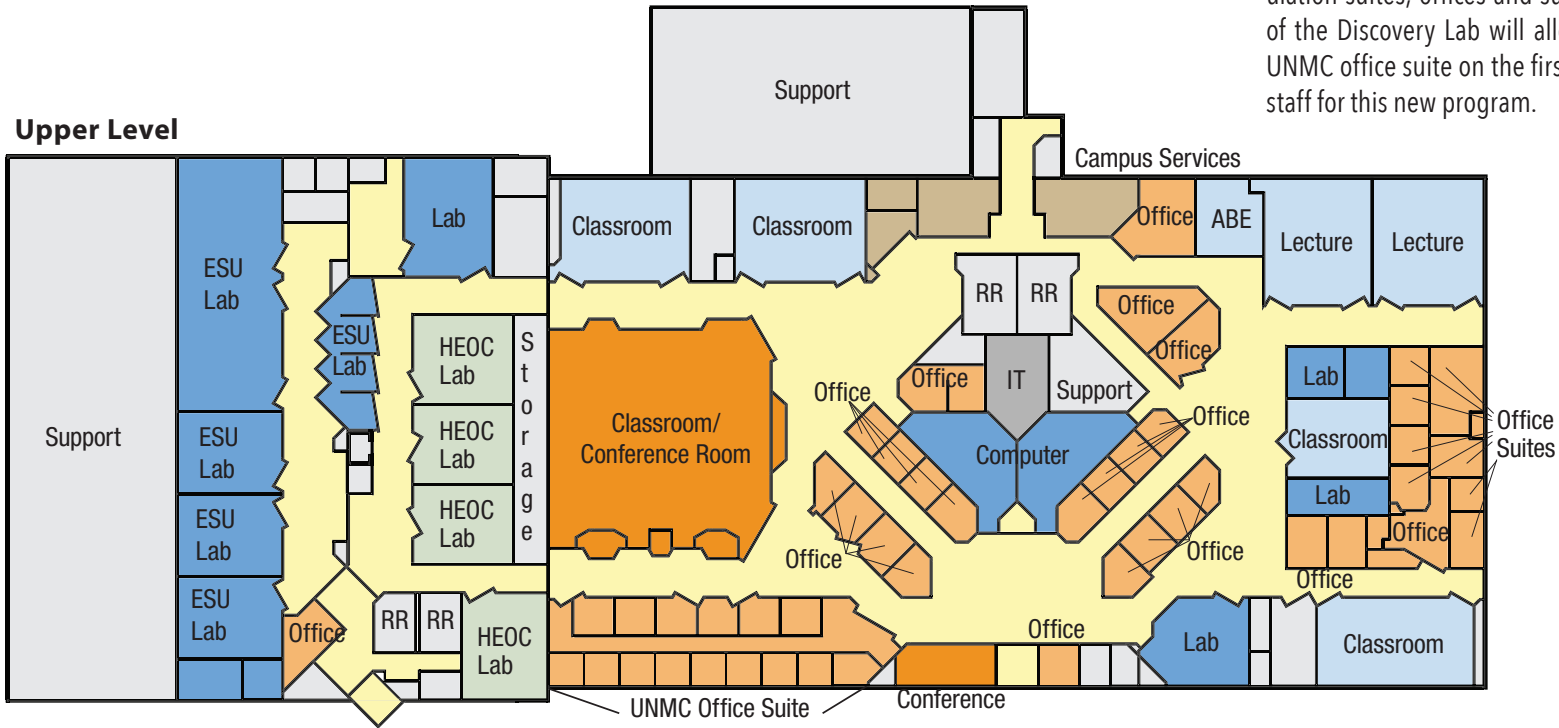
The building renovation will provide additional space to account for the increase in the number of faculty offices needed to account for growth in program areas including Allied Health, BCE and Nursing. This includes the consolidation of computer labs, the higher utilization of existing classrooms and the relocation of programs including Testing and the WNCC Foundation to other facilities on campus.

Existing Program Relocation

BCE programs will continue to utilize their current space in the lower level. Some programming will be located to other classroom space as these spaces will become available as certain programs are relocated to other facilities on campus.

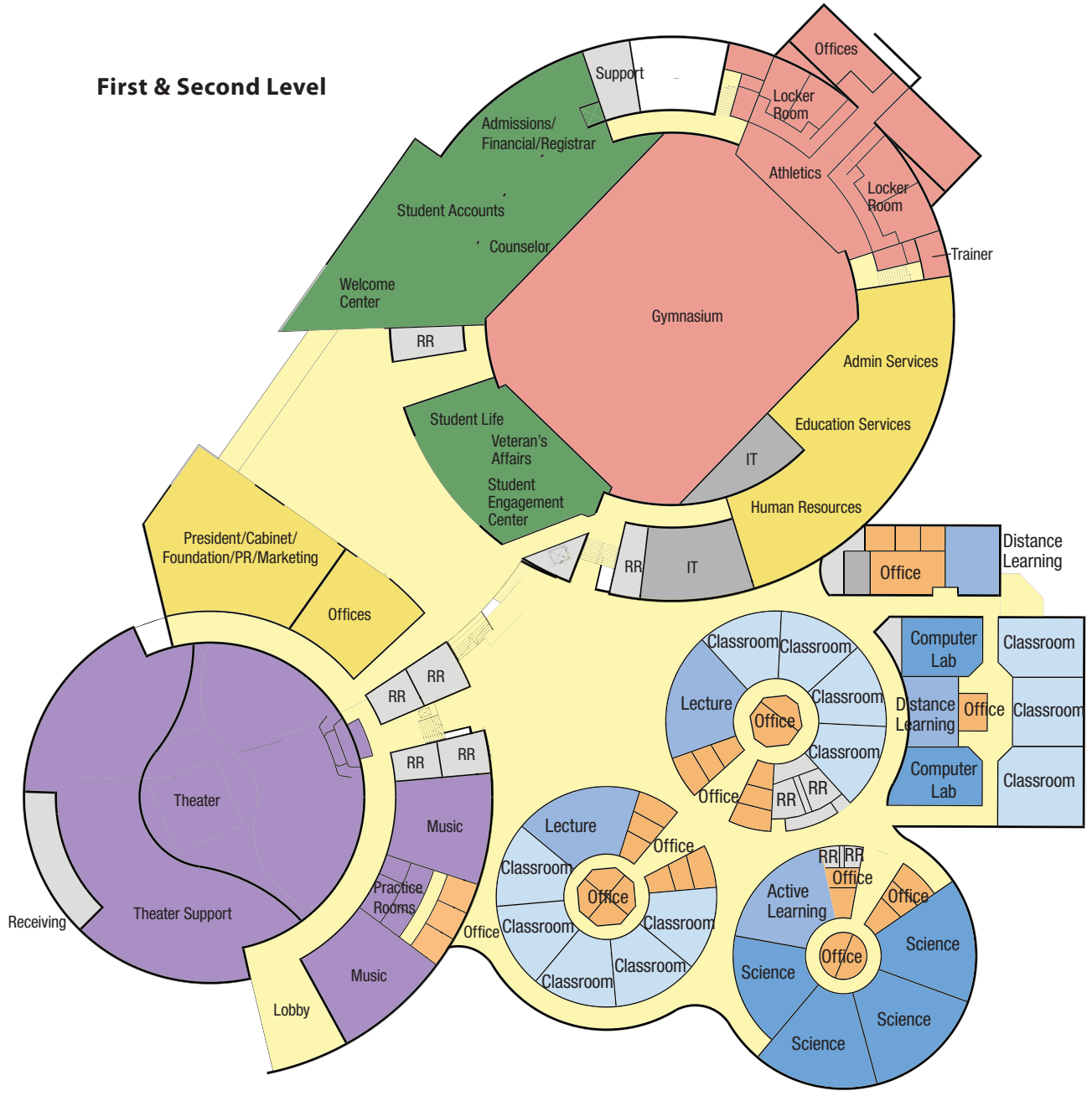
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Upper Level



First & Second Level

- Classroom
- Active Learning
- Lab
- Athletics
- Support
- Offices
- Campus Services
- Public Space
- IT
- Resident Life
- Student Services
- Registrar - Financial Aid
- President - Foundation
- Business Office
- Admissions
- Academic Affairs
- APTC - Nursing - Allied Health
- BCE
- Arts
- LRC



MAIN BUILDING

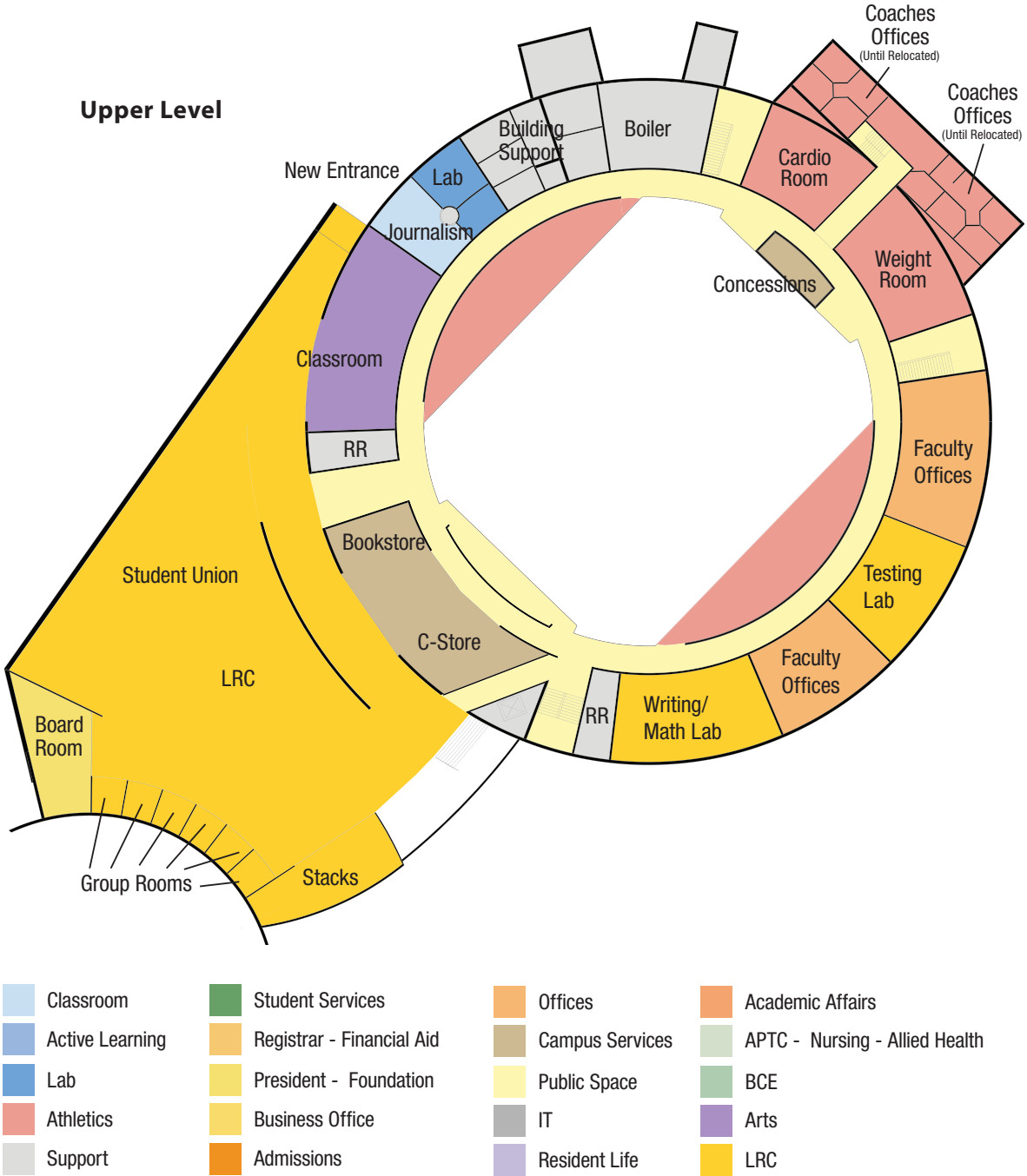
The Main Building serves not only as the predominant academic building on campus but also houses student services and the business office, thus making it the primary focus for new and existing students. The Main Building's central location creates a focal point in which all campus activity revolves. It truly is the "heart of campus".

A complete renovation of all areas not recently renovated and the reconfiguration of spaces to better support academic programs and serve the students will have a lasting impact not only on this facility but the rest of campus and WNCC as a whole.

The renovation and expansion of the Main Building can be divided into four project areas with each have sub-components of varying size and scope.

Southwest Addition - Student Services Renovation and LRC Expansion

The Addition of a new two story façade that faces southwest towards the Scottsbluff Monument will create a new entry to the Main Building and an icon for campus. The Addition will create entrance points at both levels with the upper level entrance bringing students and visitors into the new LRC/Student Union. The new LRC will provide opportunities for students to not only "hang out" but will also provide group rooms to meet and discuss class assignments. Adjacent to these group rooms and with a view to the southwest, a new board room will serve not only the Board of Governors but will also provide a space for meetings and presentations. The LRC now becomes the gathering space for students during the entire day, keeping students on campus longer. With expanded hours and various seating styles and configuration it will allow students the flexibility in a space they currently do not have. This space also has



(Main Building continued)

the potential to serve as a pre-function space for basketball, volleyball and Theater for gathering before and after events. With its view towards the southwest and the Monument, the new LRC could also serve as a community social space with dinners, fund-raisers and other events allowing the community to hold events on the WNCC campus thus exposing the campus to non-students.

Directly adjacent to the LRC is a newly envisioned Book and C-Store that will provide students a one-stop shop to pick up supplies, grab a quick bite to eat or purchase WNCC apparel. This new bookstore will also serve as an apparel and concession stand during basketball and volleyball events creating a larger revenue generation location than the current bookstore and Den.

As the center of the LRC serves new functions and roles, the perimeter continues some of the existing roles it handles now. The consolidated stacks are now relocated to the perimeter with the ability lock off this section of the space while leaving the rest open and usable.

The Art program will now be consolidated into one space on the second floor. With the use of displays and clerestory windows the new Art room will have the natural light that was lacking in its previous locations. Located along the new entrance corridor, the new Art room will serve as a display area for students' work. Visitors will walk past the shop windows that house students' artwork.

The lower level portion of the expansion and renovation focuses on the student experience as they become a student at WNCC. As students enter the building they will have a one-stop shop at the Student Welcome Center. This is the first step for students looking for assistance with student

services. The Admissions, Enrollment, Registrar, Student Accounts and other offices will be co-located to allow for the easy transmission of student information as well as alleviate any confusion for students as they seek guidance for enrollment or other services.

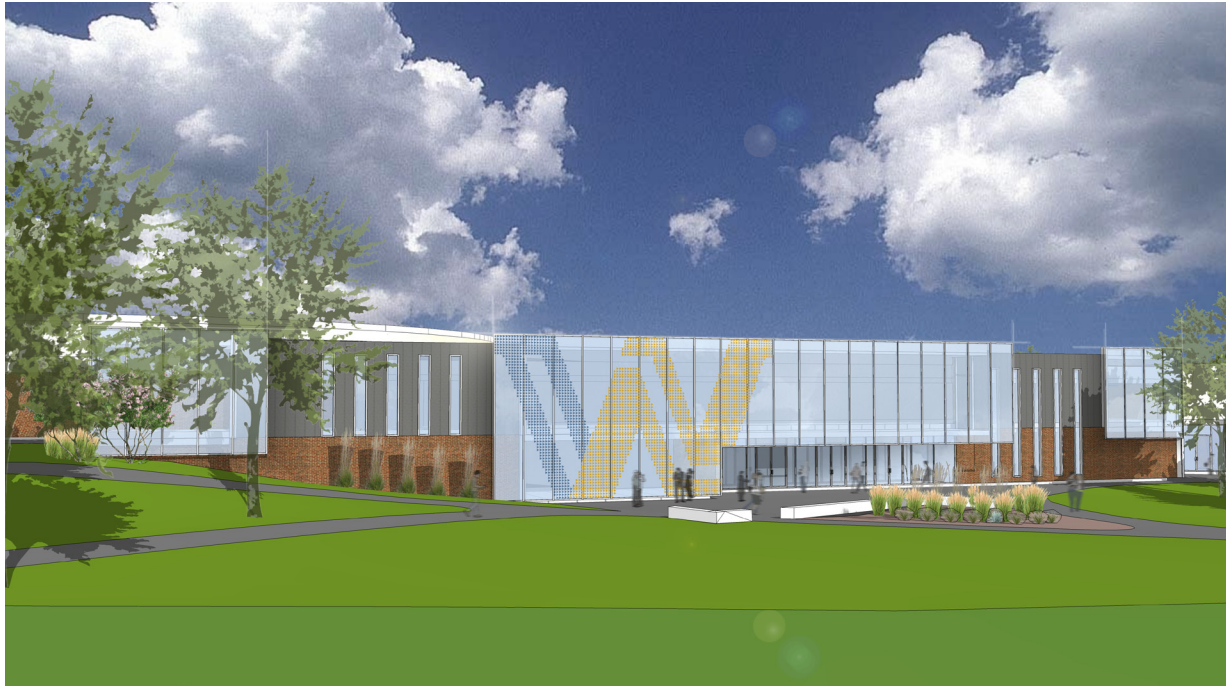
Adjacent to and in the former student services area a new Student Life and Engagement Center will be created. Located in this area will be TRIO, Veteran's Affairs with a lounge, Counseling and other groups essential in creating the best student experience.

Across the "Main Street" or central lobby on the other side of the new entrance will be the President's and Vice Presidents' offices. This location allows these key staff members to be visible and accessible by students and visitors alike. It allows for greater level of coordination between the President and the Vice Presidents. Included in the office suite will be the newly relocated Foundation Offices which were previously located in the Harms Technology Center. By locating these offices along the Public Relation and Marketing offices, a higher level of coordination can occur between these groups and the President as they look to provide greater exposure for WNCC to potential new students while receiving support from former students.

Theater and Music Renovation

The acclaimed Theater and Music programs have outgrown their current aging spaces. Not only is the space limited but the conditions of these spaces have restricted their ability to expand their programs. The expansion and renovation of these areas will provide the ability for each program to not only thrive but to grow.

The relocation of the President's Office will allow the relo-



Conceptual Rendering - Front Entrance

(Main Building continued)

cation of the music program to this area. Included with this renovation will be the creation of a new Theater and Music entrance and lobby. This additional space coupled with the reconfiguration of the existing space will provide the Music program with two large instrumental and vocal rooms with storage, four small practice rooms, one large practice room and new faculty office offices.

The Theater space will expand, being remodeled and reconfigured to provide for greater flexibility and increased storage. A new Theater entrance will be created on the northeast corner of the theater. This new entrance will provide an icon for the Theater and create a destination for those attending a performance. Connected to the new entrance will be a lobby or pre-function space that will allow patrons a socializing areas prior to shows.

The Theater space itself will be renovated completely. The installation of new seats and new carpet will guarantee attendees are comfortable during shows. Upgrades to the sound and lighting will ensure the performers are seen and heard properly while providing the ability to change depending on the performance.

The support spaces in and around the stage will be reconfigured to provide for more storage and staging capabilities. The exterior covered walkway that encircles the Theater will be enclosed and new storage and receiving areas will infill this area. The dressing and green rooms will be expanded and relocated along with new faculty offices. The stagecraft and prop workshop will also be expanded to allow for greater flexibility in terms of construction and storage of props and scenes.

The ability for various types of stage configuration allows

for greater opportunity for the Theater department in terms of shows that can be produced. With the reconfiguration of the support spaces around the stage the opportunity to present not only thrust stage but also black box style performances may be an opportunity that can be evaluated further as part of the design process.

Northeast Renovation - Administrative Services, Athletic offices & Math/Writing Lab Renovation

Similar to the Southwest Expansion and Renovation, the Northeast renovation focuses on consolidation and reconfiguration on both levels of the Main Building to increase efficiency and enhance the student experience. The upper level portion consolidates the various testing and writing labs into one area. This along with the creation of adjacent faculty offices ensures that the needed oversight is available along with the availability of the faculty as students prepare and take the various tests. By moving the testing to a centralized location on campus it provides for greater efficiency with staff as well as provides for a better first impression for high school students who may be testing at WNCC prior to their post secondary education. They now can begin to see what the experience at WNCC may be like before they actually enroll. The relocated Writing and Math lab will allow students greater access to the faculty as additional faculty offices are now located adjacent to both of these support spaces to further encourage student/faculty interaction. This truly becomes a one-stop shop for academic achievement.

The lower level reconfiguration combines the Administrative and Education Services groups along with the Human Resources department to further increase efficiency be-



Conceptual Rendering - Theater Entrance

(Main Building continued)

tween departments. The goal of combining these services is to minimize the duplication of spaces while improving the day to day function of the college.

While several issues were identified, none were of a critical nature to warrant a significant facility change. They were reviewed as Long Term solutions that would allow WNCC to expand and improve its Athletic program to be used for recruitment and revenue generation. The athletic renovations serve to bridge the gap until new athletic facilities are built on campus. Beyond system upgrades outlined in the 2012 FCA, the only major renovation recommended for the near future is the current Writing Lab will be repurposed as a cardio workout room that would be available to students and athletes alike. The long-term vision includes having the Athletic Department relocate to the Clark N. Williams Multicultural Learning Center. This would include the Coaches office along with the Trainer and Media office with their existing spaces repurposed into a student weight room, storage area and faculty offices. The gymnasium would still serve as the home court for both basketball and volleyball with an indoor practice facility and practice gymnasium constructed next to the new Athletic Department building that would provide addition practice and training space.

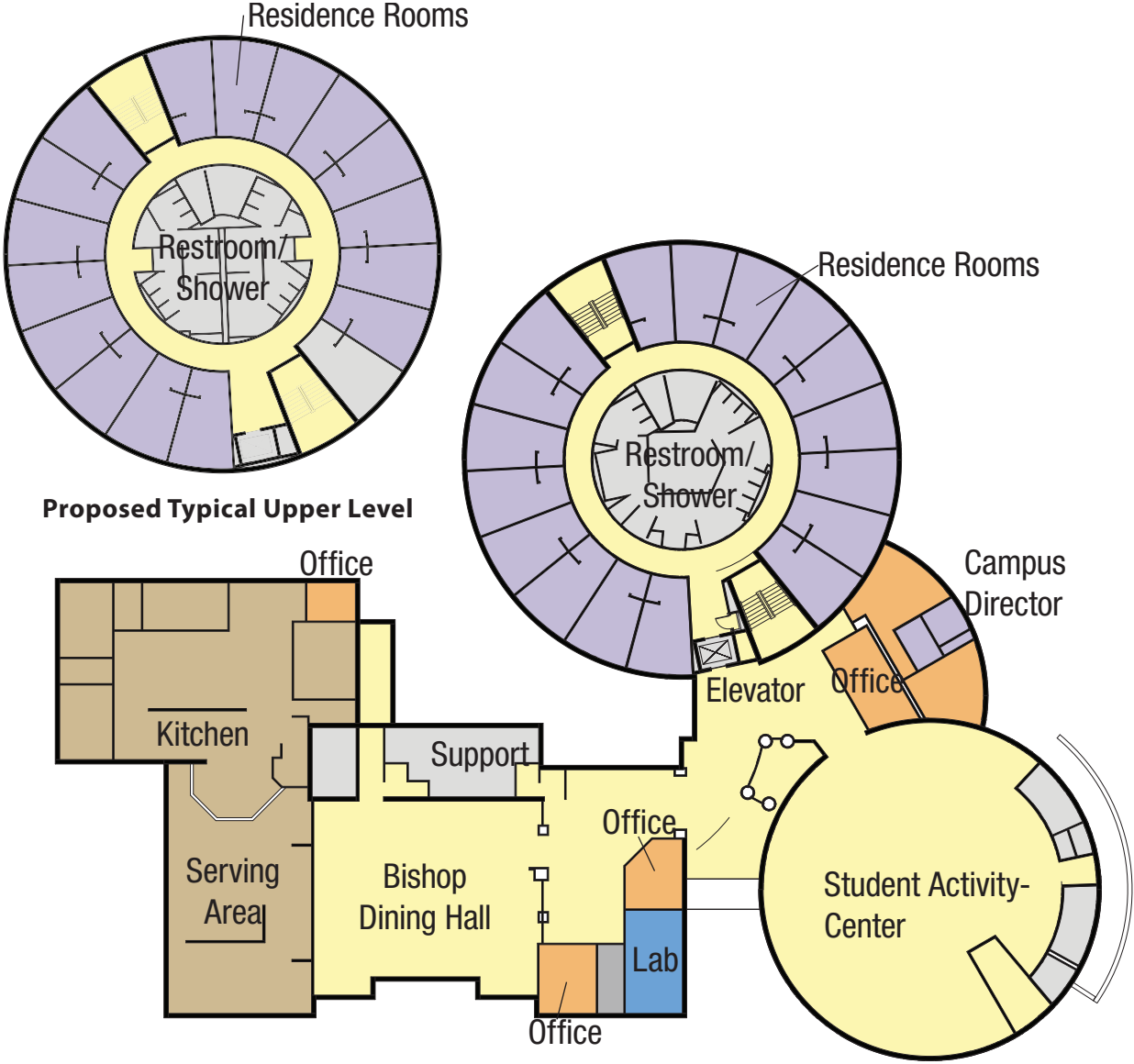
As part of the overall site Master Plan, a new Athletic field complex would be built on-site to house baseball, softball and soccer as well as intramural fields. Adding these fields on campus would increase the attendance to home games and would provide an opportunity for a partnership between WNCC and the surrounding community as these fields could also be used by teams within the City.

Classroom Pod Renovation

The focus of the Classroom Pod renovation is upgrades to the building systems including HVAC, lighting, fire sprinkler and data cabling in order to provide proper environments for the delivery of content to student.(See Appendix B for specific system upgrades) This includes reconfiguration or repurposing of rooms to general or active learning style classrooms. Pods A and B will have significant remodels as little previous work has been done to these areas ,while Pods C and D will require minor work due to the fact that they have been previously renovated to some degree.

The student, faculty and staff interaction space formerly known as the "Pit" will be removed and remodeled to serves as an extension of the new LRC. The new skylight will transform this space into a vibrant and active space for students and faculty to interact and socialize. The ability to get natural light into this space begins to create a space that is comfortable and enjoyable and encourages students to stay on campus and interact, thus creating relationships and positive experiences.

*2012 Facilities Condition Assessment Report identified exterior renovation items that are not reflected in the Master Plan cost estimate, however the item may be addressed in conjunction with the interior renovations for cost efficiency. All interior spaces scheduled for remodel or renovation will address system issues identified in the 2012 FCA report. See Appendix B for the recommended systems upgrades.



PIONEER RESIDENCE HALL

Identified as a primary project of concern and in need of immediate attention, the renovation of Pioneer Residence Hall will provide the ability to extend the useful life of this facility. The major emphasis of the renovation will be the residence rooms and restrooms/showers. The renovation of these areas will look to address the items outlined in the 2012 FCA report including the numerous heating and cooling issues experienced in the residence rooms, the numerous controls issues and general overall operation issues. As part of this remodel; new finishes, casework and other amenities should be upgraded to match the level of finish found at the other residence hall. The renovation of each floor will look to address the many accessibility concerns that currently plague this facility including handicap showers, door size and clearance issues and overall accessibility. The most pressing accessibility issue is the lack of proper access to each floor which will be solved by the addition of an elevator that serves each floor.

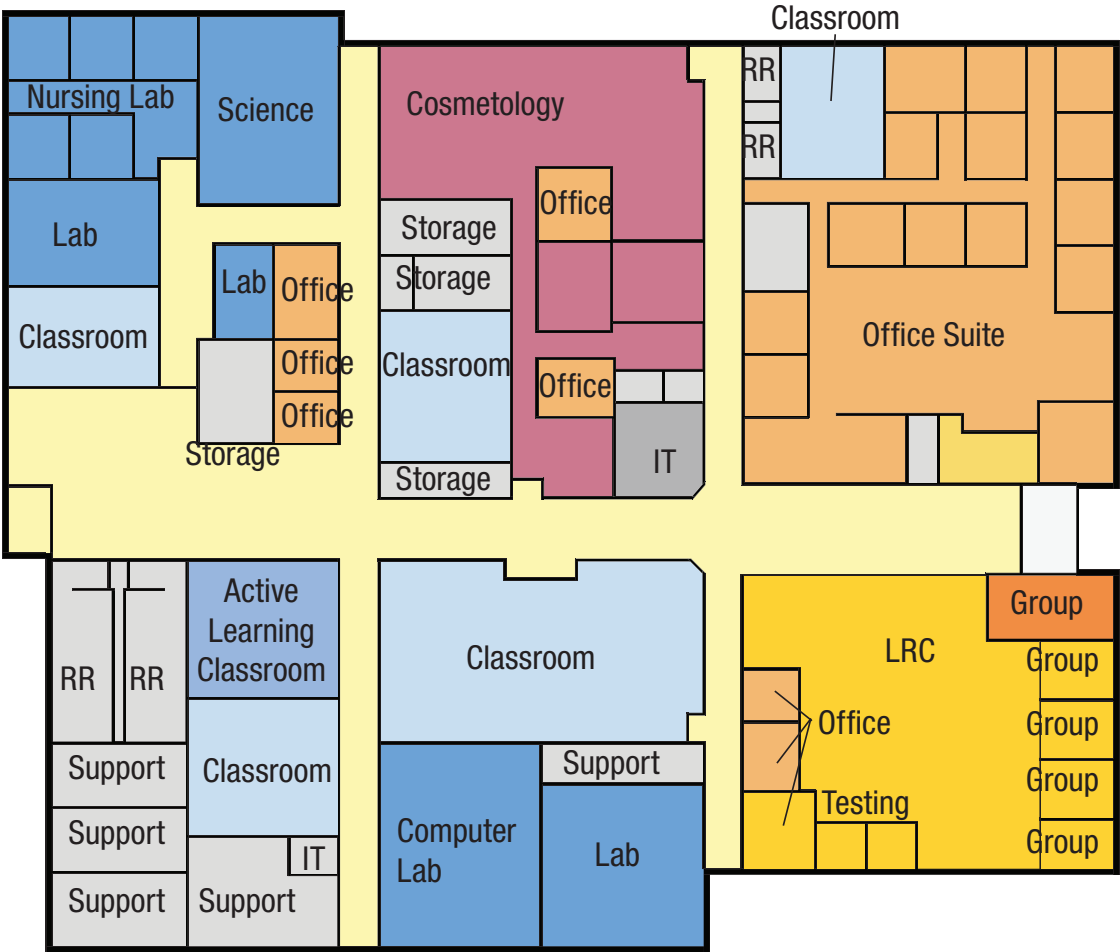
Potential additional residence rooms located in a renovated existing kitchen and dining space was explored. Based on the smaller footprint and egress issues the cost to re-

model this area into residence rooms could not be justified. Given the lack of need for residence rooms, the investment was deemed to be cost prohibitive. Space will remain as student socialization and study space.

It is recommended that as the interior renovations occur, serious consideration be given to the exterior items identified in the 2012 FCA, including the replacement of the aluminum windows in each residence room and the roof. These exterior improvements along with others will allow for the facility to operate at peak performance while minimizing costly repairs.

*2012 Facilities Condition Assessment Report identified exterior renovation items that are not reflected in the Master Plan cost estimate, however the item may be addressed in conjunction with the interior renovations for cost efficiency. All interior spaces scheduled for remodel or renovation will address system issues identified in the 2012 FCA report. See Appendix B for the recommended systems upgrades.

Classroom	Student Services	Offices	Academic Affairs
Active Learning	Registrar - Financial Aid	Campus Services	APTC - Nursing - Allied Health
Lab	President - Foundation	Public Space	BCE
Athletics	Business Office	IT	Arts
Support	Admissions	Resident Life	LRC



SIDNEY MAIN BUILDING

A full renovation of the Science and Nursing classrooms is needed to meet program needs as well as future content delivery techniques. This includes new storage and teaching station for the Science classroom. A complete configuration of the Nursing area with a simulation lab and adjacent observation room will provide the needed tools to prepare students for the medical field. As part of the renovation additional lab space will allow for expanded course teaching and student interaction areas.

Cosmetology classroom and lab space

Replacing casework and countertops will enhance the usage and flexibility of these spaces. A new material storage area will alleviate the overcrowding and loss of space the area currently has. A renovated client lounge and front transaction area provides clients and students the ability to interact in a professional manner as the space will more closely replicate the setting that awaits graduates of this program.

Classrooms and labs should be configured to support active learning configurations in the future

Library

The creation of small group rooms in the existing library space will allow for collaboration between students as well as private study areas. As more reading material moves towards a digital format, the need for storage area provide

the ability to reduce the current number of stacks and free up this space to create other interaction areas. As part of the LRC renovation, the testing area and testing office adjacent for monitoring can be expanded.

The renovation and expansion of the Student lounge and study area will encourage greater student interaction.

Office Area

Greater privacy is needed in this area for students and staff to discuss various personal topics. Alternative furniture options for staff should be evaluated to create a clear distinction between public/student areas and staff/business areas to address the privacy issues.

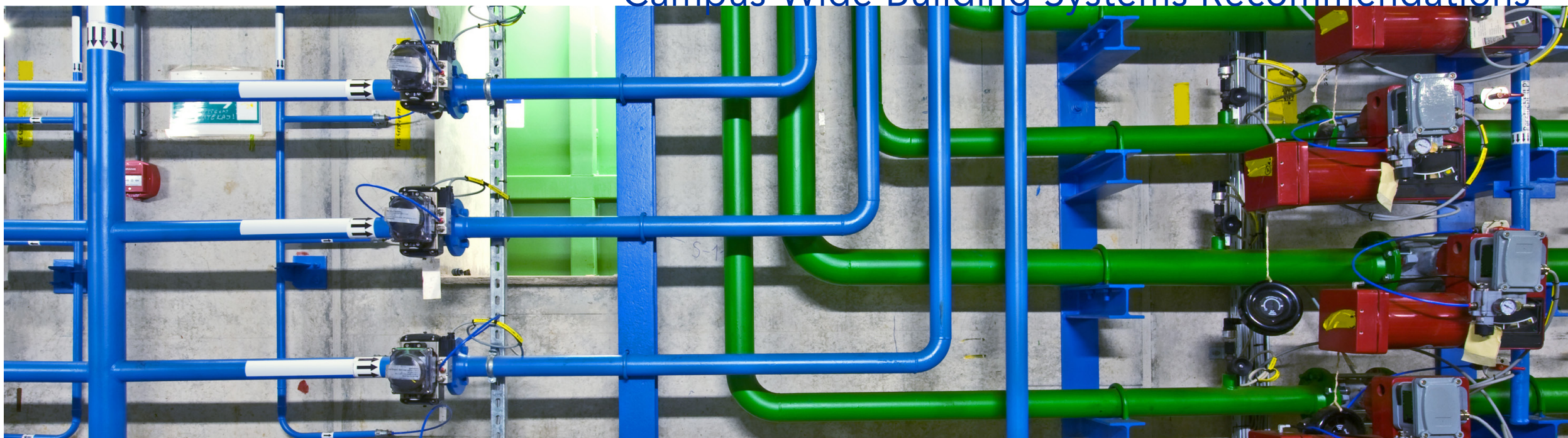
The Sidney Campus as a whole will look to expand to include student housing. The logical expansion of the campus for housing is to the west. Phase 1 would include beds for 50 in an apartment style layout, parking and a meeting room for 150 people. Phase II would expand the beds from 30 to 60, with additional parking, as needed.

SIDNEY AIRPORT

As part of the Applied Technology Center expansion and renovation, the existing paint booth will be relocated to the Sidney Airport Facility to provide a proper space for the painting of aircraft parts. Additional space is needed for the storage and maintenance of additional aircraft as they are purchased and brought into the program.

Classroom	Student Services	Offices	Academic Affairs
Active Learning	Registrar - Financial Aid	Campus Services	APTC - Nursing - Allied Health
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Campus-Wide Building Systems Recommendations



CAMPUS-WIDE RECOMMENDATIONS

Utilities Systems

Electrical Power

The 2002 MKK report indicated that the majority of the electrical distribution system on campus, including the 5kV electrical distribution cables and the transformers, were owned by WNCC. The 2012 EMG report states that the electrical distribution system is owned by Nebraska Public Power District (NPPD). Based on the more recent report, it is expected that the electrical distribution cables, as well as the transformers, metering, and electrical switches, are all owned and maintained by Nebraska Public Power District.

Recommendations

1. If there is any remaining electrical distribution equipment on the site that services facilities as WNCC, it is recommended that over time, these be converted to NPPD assets and upgraded at that time. It is likely not cost effective for WNCC to have the long-term capital expense and maintenance costs of owning and maintaining the distribution system.
2. If the meters for the various facilities on campus are currently not totalized, it is recommended that WNCC engage NPPD in discussions about aggregating their electrical meter consumption and demand. This would likely allow them to have a better rate structure for the total load on campus.

Telecommunications

Information regarding the telecommunications distribution systems on campus was not available. Telecommunica-

tions systems include voice, data, and CATV.

Recommendations

1. If a telecommunications record document of the distribution systems on campus has not been completed, it is recommended that this be done as soon as WNCC has the capital to invest in hiring an independent consulting firm and/or the vendors to provide this information on a consolidated, composite campus plan.
2. A telecommunications master plan should be developed. This should be done in cooperation with an independent, qualified telecommunications engineering firm, as well as the campus IT and technology staff. The master plan should look a minimum of 10 years forward to determine the infrastructure needs for the campus.
3. If the campus has not begun to deploy wireless data on the campus site and within the facilities, this should be given serious consideration. Currently, many higher education facilities are going strictly to wireless systems, both in the classroom and on the campus grounds for the teacher and student populations. Some limited hard-wired data is still provided.

Mechanical Systems

HVAC Systems

The 2012 EMG Facility Condition Assessment provides a good inventory of the mechanical equipment across the campus. There is a wide variety of equipment types and manufacturers. It is expected that this variety will continue as the college replaces equipment and expands its facilities.

Recommendations

Develop a basic set of HVAC system design standards and requirements. It is suggested that, at a minimum, these include the following:

1. Review the various energy efficiency levels and costs for any new or replacement HVAC equipment to determine the best payback.
2. Develop appropriate control sequences for each type of system and equipment.
3. Create a schedule of standard equipment types, e.g., chiller types preferred, refrigerant type, etc.
4. Develop a list of a minimum of three manufacturers for each piece of equipment and require contractors to price each of the specified equipment so that WNCC can select the appropriate equipment based on cost, performance, and quality of service.
5. Create standards for specific requirements for integration of equipment and systems into campus Building Management Control System (BMCS).

HVAC Controls

Based on the EMG report, the controls on campus are primarily pneumatic. Although they have been for the most part, fairly well maintained, pneumatic controls have inherent ongoing issues.

Recommendations

1. An independent consulting engineering firm should be hired to develop a technical specification for the primary equipment required to convert the campus to a direct digital controls system. Based on the technical specification requirements, competitive prices should be obtained from multiple control vendors. The selected vendor list should be based off the service organizations located in the WNCC region.
2. The bid package for the controls conversion should include a requirement for the vendor to provide pricing for additional controls components for various types of systems and equipment for a minimum of a three-year window.
3. Service agreements should be priced as a part of the controls bidding process for a minimum of three years.
4. An open-protocol interface should be considered as a part of the controls specification and bid proposal.
5. Standard controls sequences should be developed for various types of systems, equipment, and terminal units.
6. The HVAC control system shall also provide remote Web-based access to the building automation systems. This will allow maintenance staff and/or the contracted maintenance firm to access the building systems 24/7 via the use of any Web-enabled mobile device and/or remote computer.

Plumbing Systems

Based on the 2012 Facility Condition Assessment, the plumbing systems on campus are generally in good shape. Routine maintenance is performed as needed on the plumbing systems.

Recommendation

1. Develop plumbing standards, including the following:
2. Flush valves for toilets and urinals
3. Three or four acceptable manufacturers for faucets
4. Manual versus automatic faucets
5. Piping standards (copper, PVC, etc.)
6. Three or four manufacturers for fixtures

Fire Protection Systems

Sprinkler systems are provided in the residence halls on campus. Generally, sprinkler systems are not included in the academic buildings.

Recommendation

1. WNCC should continue to develop a strategy to provide fire protection in as many of their existing facilities as possible. In addition, WNCC should provide fire protection systems in all new facilities.
2. Depending on the type of facility, a dry pipe system may be required due to cold temperatures.

Electrical Systems

Fire Alarm Systems

There are a variety of existing fire alarm systems. Based on the 2012 EMG report, the fire alarm systems are in good

repair and are being maintained regularly.

Recommendations

1. Continue to standardize the fire alarm systems equipment installed on campus within the buildings.
2. Continue to integrate the fire alarm systems into the campus-wide fire alarm monitoring system located in the main building.

Interior Lighting Systems

WNCC is currently in a program to convert their fluorescent lighting systems to T8s with electronic ballasts. This program should continue. Use of T8 lamps with electronic ballasts is a quality, energy-efficient system.

Recommendations

1. Where downlights are being utilized, consideration should be given to using LED downlight fixtures. Pricing for LED downlight fixtures makes them competitive with compact fluorescent downlights. The LED downlights use approximately 20% to 30% less energy than the comparable compact fluorescent downlights.
2. Occupancy sensors should be used wherever practical throughout campus. Occupancy sensors have a proven payback of less than five years.
3. Where high-bay lighting fixtures are used in facilities, consideration should be given to LED high-bay fixtures. While the costs are currently somewhat more than traditional high-bay fixtures, the lamp life is significantly longer, and in addition, the energy usage is lower. The savings on maintenance costs, replacement, and energy provide a reasonable payback to

justify the use of these fixtures in this application.

Exterior Lighting Systems

In general, the exterior lighting systems utilize HID sources for parking lots and roadways. Exterior lighting associated with buildings are typically HID fluorescent with low-temperature ballast, along with a few LED fixtures.

Recommendation

1. As exterior lighting fixtures need repair and/or replacement, consideration should be given to standardizing on LED parking and roadway fixtures. LED parking and roadway lighting fixtures are currently competitive with traditional HID fixtures when comparing energy, lamp life, and ongoing maintenance costs.

Life Safety Power Systems

Currently, egress lighting and life safety systems are provided power through DC battery systems and/or unitary battery-powered lights.

Recommendation

1. Consider the use of small natural gas generators at the facilities when life safety systems are being upgraded, including upgrade of egress lighting in existing facilities and specifically life safety systems in new buildings. Natural gas generators 30kW or less would likely cover the life safety requirements of nearly each individual building on campus. The natural gas generators are very reliable and can be maintained through an ongoing service contract. These systems have proven to be significantly more reliable than battery pack egress lighting systems. They can also be used to back up

non-life safety equipment, such as sump pumps and heating water pumps for freeze protection in buildings.

Deferred Maintenance

As discussed in the Executive Summary, the campus has had good results with maintaining their facilities. The maintenance staff appears to invest significant time and effort into keeping the campus facilities and infrastructure in good operational condition.

Recommendations

1. To ensure that maintenance and/or capital expenditures to replace and/or repair facility infrastructure, an annual sinking fund should be developed for the ongoing deferred maintenance.
2. The deferred maintenance budget should be funded at an annual rate of 1% to 4% of the value of the capital assets.

EMERGENCY POWER

Main Building

An emergency generator would be provided to allow business continuity within the college campus. Backup power would include services for telecommunications and workstations in the main office areas. Specific loads will have to be determined at the time of implementation.

Operational Continuity

Power would be provided for data communications systems and miscellaneous power to support specific work stations.

Work Required

The electrical systems would be required to be rewired to allow the power source for the critical systems to be backed up to be fed from a separate critical power distribution system. This power distribution system would then be served by permanently installed exterior, self-contained natural gas and/or diesel generator, sized at approximately 75 kW. This is a nominal increase of approximately 50 kW over the requirements for strictly life safety systems.

Cost Estimates

- Rewiring of critical electrical systems: \$60,000
- Generator: \$75,000

Pioneer/Bishop Dining Hall

Emergency power would be provided in Pioneer and Bishop Hall to provide both asset protection and operational continuity.

Asset Protection

Freezers, coolers, and food storage areas would be backed up to provide protection of product in the event of a power outage.

Operational Continuity

Power would be provided for data communications systems and miscellaneous power to support specific work stations.

Work Required

The electrical systems would be required to be rewired to allow the power source for the critical systems to be backed

up to be fed from a separate critical power distribution system. This power distribution system would then be served by permanently installed exterior, self-contained natural gas and/or diesel generator, sized at approximately 50 kW. This is a nominal increase of approximately 25 kW over the generator requirements for strictly life safety systems.

Cost Estimates

- Rewiring of critical electrical systems: \$40,000
- Generator: \$50,000

IT & AV

1. Investigate redundancy and disaster recovery procedures.
2. Establish campus standards for technology in classrooms as well as student hardware and software.
3. Identify upgrades to wireless connectivity as well as data cabling in existing buildings.
4. Identify a vision group for implementation of technology changes college wide.

Sustainability



SUSTAINABILITY GUIDELINES

Site

As the campus evolves, development should look to embrace site improvements that are sensitive to the landscape, regional ecology and campus users. Strategic location of infrastructure, open spaces and natural resources will help reduce costs and improve the campus image. The image of the college is set forth from the unique position of Scottsbluff, located on the North Platte River overlooking the Western High Plains. Its climate varies significantly throughout the season with cold winters and hot, dry summers. Precipitation averages around 16 inches per year. Soils on campus have varying amounts of silt, sand and clay but are generally classified as “Sandy Loam” according to the USDA soil survey.

With these factors in mind, it is recommended that the college embrace the local ecology through the implementation of responsible campus development. This will help improve the visual aspect of campus and help create a landscape that students can identify with.

Open space areas on campus should promote pedestrian connectivity through the use of walkways, traffic calming features, landscaping, and student gathering areas. Management of these areas should use native plants, trees and shrubs limiting the amount of irrigation and creating habitat for local wildlife. In addition, these plants should be orientated in a way that can help slow traffic, enhance the landscape and manage storm water.

Campus owned lands that are currently vacant can be

planted with native short grass prairie. Implementing short grass prairie can cut down on domestic or well water demands and save the college significant operational costs for mowing.

Site improvements should embrace sustainable storm water management by promoting the infiltration of surface waters from all paved and roof areas. Bioswales, permeable pavers and bioretention cells can all be used to limit the amount runoff and help remove pollutants from pavement surfaces.

Community

Creating connections with the community and services through alternative transportation will promote lower emissions, as well as promote an active commute through campus. Secure bike racks should be placed near entrances to all facilities. Walking and bike paths should be visible, accessible and provide connections to services on and off campus. Other multi-modal methods of alternative transportation could be a campus wide bike sharing program, electric charging stations for golf carts or vehicles, and car-pool sharing programs and stalls. Offer discounted transit bus passes for staff and students versus having them drive to campus. Create competitions with students/staff to promote alternative transportation and carpooling on campus.

Water

Water usage indoors and outdoors on campus can quickly add up to thousands of dollars a year. Landscape irrigation can be reduced or eliminated utilizing xeriscape techniques for plantings, drip irrigation, and turf reduction. In-

Table A

Commercial Fixtures, Fittings, and Appliances	Current Baseline (Imperial Units)	Current Baseline (Metric units)
Commercial Toilets	1.6 gallons per flush (gpf)* Except blow-out fixtures: 3.5 (gpf)	6 liters per flush (lpf) Except blow-out fixtures: 13 lpf
Commercial Urinals	1.0 (gpf)	4 lpf
Commercial Lavatory (Restroom) Faucets	2.2 gallons per minute (gpm) at 60 pounds per square inch (psi), private applications only (hotel or motel guest rooms, hospital patient rooms) 0.5 (gpm) at 60 (psi)** all others except private applications 0.25 gallons per cycle for metering faucets	8.5 liters per minute (lpm) at 4 bar (58 psi), private applications only (hotel or motel guest rooms, hospital patient rooms) 2.0 lpm at 4 bar (58 psi), all others except private applications 1 liter per cycle for metering faucets
Showerheads	2.5 (gpm) at 80 (psi) per shower stall ****	9.5 lpm at 5 bar (58 psi)
For projects with commercial pre-rinse spray valves, the flow rate must comply with the ASME A112.18.1 standard of 1.6 gpm or less.		

door plumbing fixtures can easily be modified to include low flow aerators on faucets, or dual flush handles for inexpensive water reductions. New plumbing fixtures should not exceed levels listed in Table A for maximum efficiency.

Energy & Atmosphere

Refer to Appendix C for more information on alternative energy technologies.

Specific recommendations for mechanical/electrical sustainability strategies are listed below. These strategies have been identified, because they have proven to be economically effective and beneficial in understanding such metrics as energy consumption per square foot of facilities.

Some of these recommendations are embedded in the campus and building-specific recommendations; however, they are included in this list to provide a comprehensive view of the recommended strategies.

1. Utilize LED light fixtures for all exterior lighting
2. Utilize LED downlights for interior lighting.
3. Provide occupancy sensors for lighting control in interior building spaces.
4. Provide metering for all electrical systems within buildings. Metering, at a minimum, should be provided for each individual building. In addition, electrical metering should be provided on major subpanels. Metering equipment to achieve

the appropriate level of information is currently economical and is becoming much more widely available. Manufacturers include E-Mon D-Mon, Square D, Siemens, GE, and others.

5. Provide CO2 sensors in classroom areas to take advantage of demand ventilation. CO2 sensors will allow the units to draw in warm or cold outside air to meet code ventilation requirements only when spaces need it based on CO2 levels. This has a significant impact on energy reduction.
6. Consider a geothermal HVAC system as HVAC systems require replacement. These systems utilize ground wells for heat rejection, as well as heating and cooling of the air supply for HVAC systems. In addition, from time to time, utility service providers, such as NPPD, have relatively significant rebates or economic assistance for the development of geothermal systems within buildings.
7. Analyze the use of solar water heating systems for domestic hot water use in facilities that have a relatively higher demand for domestic hot water, such as residence halls, food service facilities, etc. Solar water heating systems have an economic payback in these types of facilities. There are differ-



ent technologies and multiple manufacturers of quality solar water heating systems.

8. Analyze photovoltaic and wind systems for potential installation on facilities and ground-mounted options. Photovoltaic and wind turbines typically require a tax incentive and/or utility subsidy to be economically viable. However, many colleges and universities are developing these installations for education and demonstration purposes. Metro Community College in Omaha has developed a joint program with Creighton University for a wind and solar installation.
9. Consider capturing condensate, rain water, and other sources of grey water via packaged systems that can be utilized for site irrigation

Materials and Resources

For future construction projects develop and implement a Waste Management Plan, providing detailed directions in regards to material disposal for contractors when demolishing or renovating existing structures, or building new construction. Require monthly reports to track landfill versus diverted materials. Goals for landfill diversion should be at least 50%. Provide location of recycling facilities, as well as instructions of size and quality of demolished materials based on recycling facility requirements. When selecting building materials for interior and exterior, consider products that are considered rapidly renewable materials, contain a high recycled content value, and select regional materials that are located within a 500 mile radius of the campus. Consider repurposing existing materials on campus or donating to a local Habitat for Humanity organization. New wood products should be harvested from a sustainably managed forest. Composite woods that do not have added urea formaldehyde resins are desirable. See Table B for composite wood information. Work with student groups to create designated areas for recycling in classrooms, lounges, dining, and focal points on campus.

Table B

LOW-EMITTING MATERIALS—COMPOSITE WOOD AND AGRIFIBER PRODUCTS REQUIREMENTS	
Composite wood and agrifiber products: • Particleboard • Medium density fiberboard (MDF) • Plywood • Wheatboard • Strawboard • Panel substrates • Door cores • Plywood sections of I-beams	No added urea-formaldehyde resins
Laminating adhesives used for assemblies	No added urea-formaldehyde resins

Indoor Air Quality

Interior building materials should also be selected based on low Volatile Organic Compound (VOC) content. Materials that off-gas and cause harmful fumes include, but not limited to, wall coverings, paints and coatings, adhesives, furniture, and cabinetry. Acceptable VOC limitations are listed in Table C. Develop and implement an Indoor Air Quality Management for construction and pre-occupancy. New building materials should be protected from construction activities to prevent dust and debris from entering mechanical ducts. Indoor air quality testing could be performed prior to occupancy to test for VOCs, formaldehyde and other particulates. A building flush out would also eliminate any harmful VOC's still in the building prior to occupancy. Both options would need evaluation based on time and cost. Allowing individuals control over the lighting and thermal controls in their workspaces can enhance their comfort, productivity, satisfaction, and overall well-being. Better lighting controls can also increase the efficiency of your lighting system by focusing on task lighting rather than unnecessary ambient lighting, and can reduce energy

use due to cooling loads by allowing occupants to turn off lights when leaving their space or when daylight is sufficient. It is recommended that you optimize the lighting system as part of the overall space design. This could mean a combination of dimmers, occupancy and daylight sensors for multi-occupant spaces, and adjustable task lighting for individually occupied spaces. ASHRAE Standard 55-2004 identifies the factors of thermal comfort and a process for developing comfort criteria for building spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria and enable individuals to make adjustments to suit their needs and preferences. These strategies may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls; local diffusers at floor, desk or overhead levels, control of individual radiant panels, or other means integrated into the overall building, thermal comfort systems and energy systems design.

Access to daylight inside buildings makes for healthier and more comfortable occupants—and is also linked with greater productivity. When designed with proper glare control and minimized solar heat gain, day lighting provides high-quality light while reducing energy use for lighting and for cooling. Day lighting strategies must balance with other design goals. For example, you will want to provide enough glazing area for lighting, and plan for open spaces that allow for light transfer, but not at the expense of too much heat gain, glare, or loss of privacy. Buildings that provide views to the outdoors have proven to enhance productivity, testing performance, and overall occupant comfort and well-being.

Table C

LOW-EMITTING MATERIALS— ADHESIVES AND SEALANTS REQUIREMENTS	
All adhesives and sealants must comply with South Coast Air Quality Management District (SCAQMD) Rule #1168 limits for volatile organic compounds (VOCs) limits, as listed below.	
Architectural Applications	VOC Limit (g/L less water)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT & asphalt adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Specialty Applications	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Contact adhesive	80
Special purpose contact adhesive	250
Structural wood member adhesive	140
Sheet applied rubber lining operations	850
Top and trim adhesive	250
Substrate-Specific Applications	
Metal to metal	30
Plastic forms	50
Porous material (except wood)	50
Wood	30
Fiberglass	80
Sealants	
Architectural	250
Roadway	250
Other	420
Sealant Primers	
Architectural non-porous	250
Architectural porous	775
Other	750
Aerosol Adhesives must comply with Green Seal Standard for Commercial Adhesives GS-36 requirements in effect on October 19, 2000.	
Aerosol Adhesives	VOC Limit
General purpose mist spray	65% VOCs by weight
General purpose web spray	55% VOCs by weight
Special purpose aerosol adhesives (all types)	70% VOCs by weight

Curriculum and Student Involvement

A key to the momentum of the campus sustainability efforts is the involvement of students and staff. Develop a Green Team among staff and students to spearhead campus recycling, alternative transportation incentives, and student competitions. Create programs tailored to sustainability issues such as alternative energy, high performance construction, environmental law, public health, sustainable agriculture, energy and climate, sustainable communities, biodiversity conservation and management, land and water resources.

Appendix A

Applied Technology Building

Clark N. Williams Multicultural Learning Center

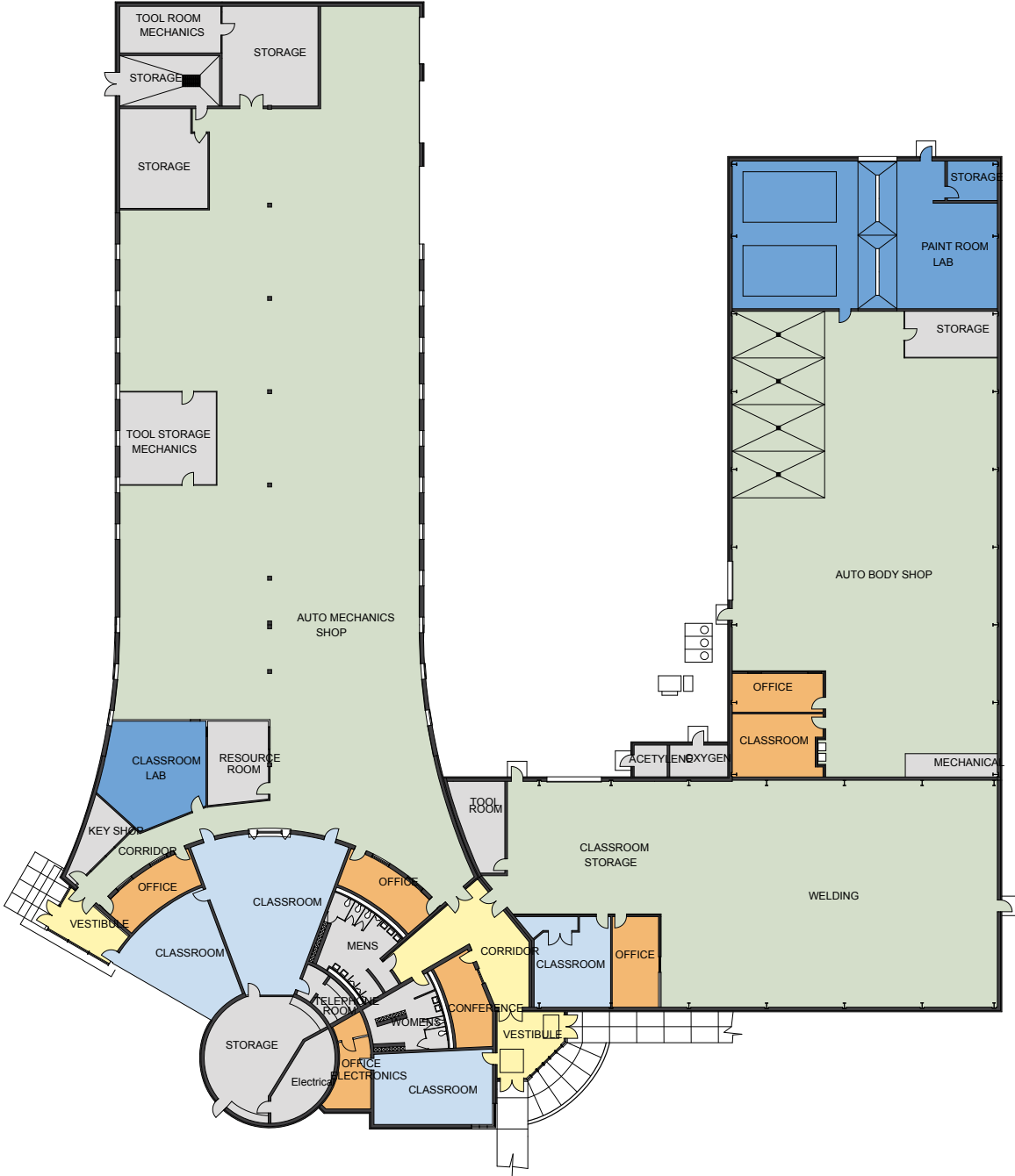
Harms Advanced Technology Center

Main Building

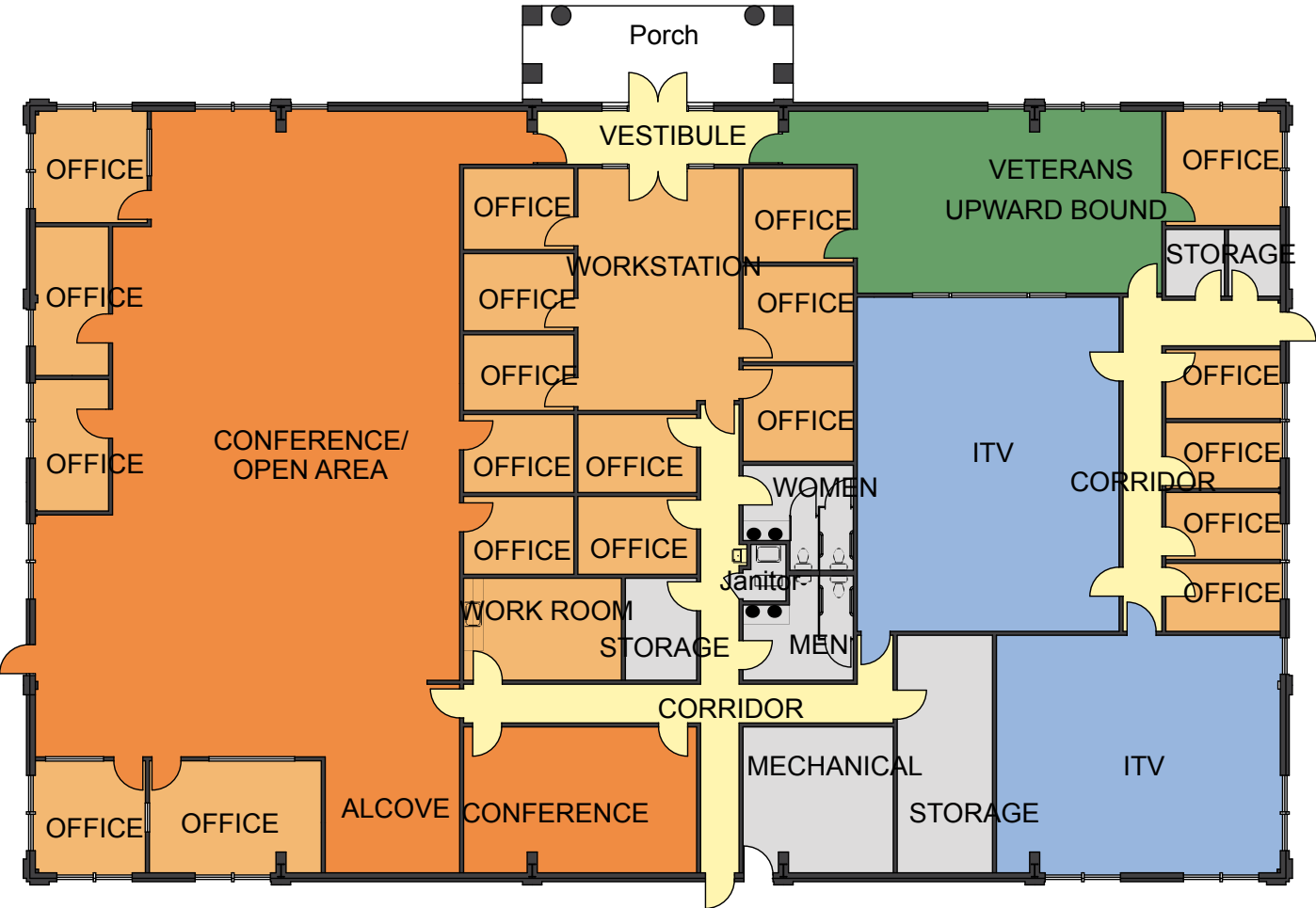
Pioneer Hall

Sidney Campus

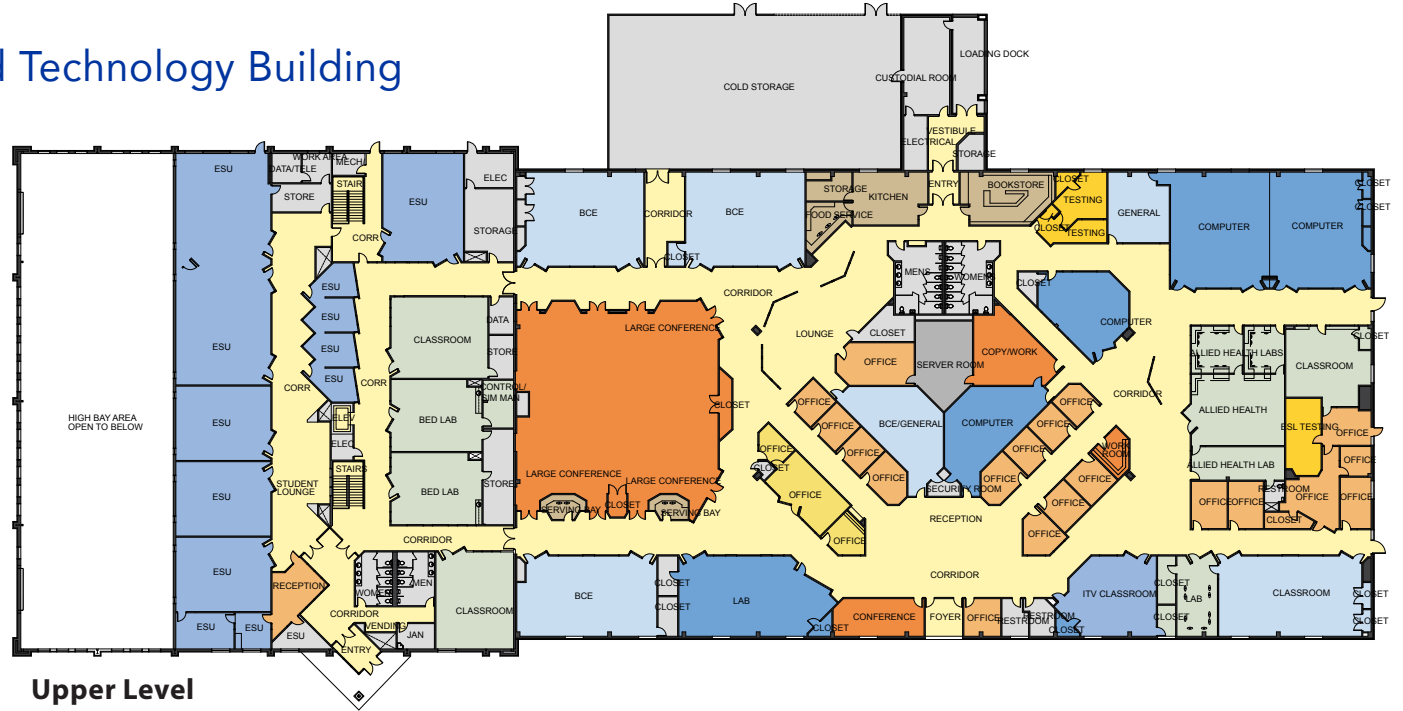
Existing Applied Technology Building



Existing Clark M. Williams Multicultural Learning Center



Existing Harms Advanced Technology Building

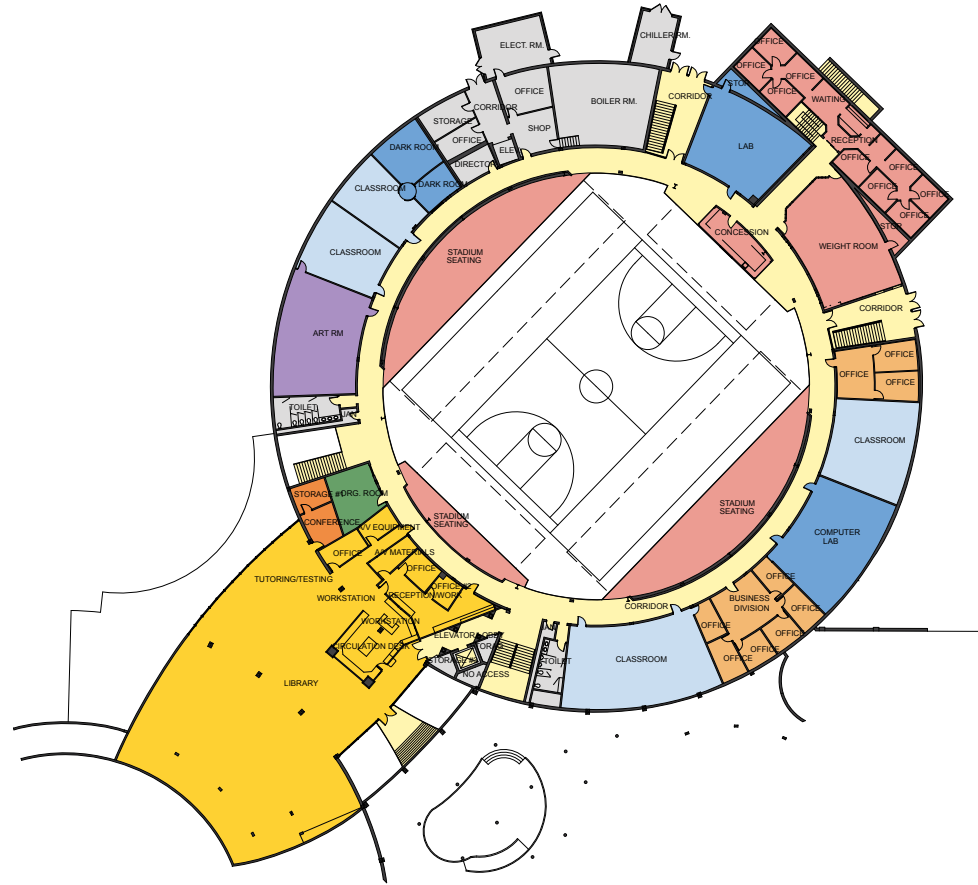


Upper Level

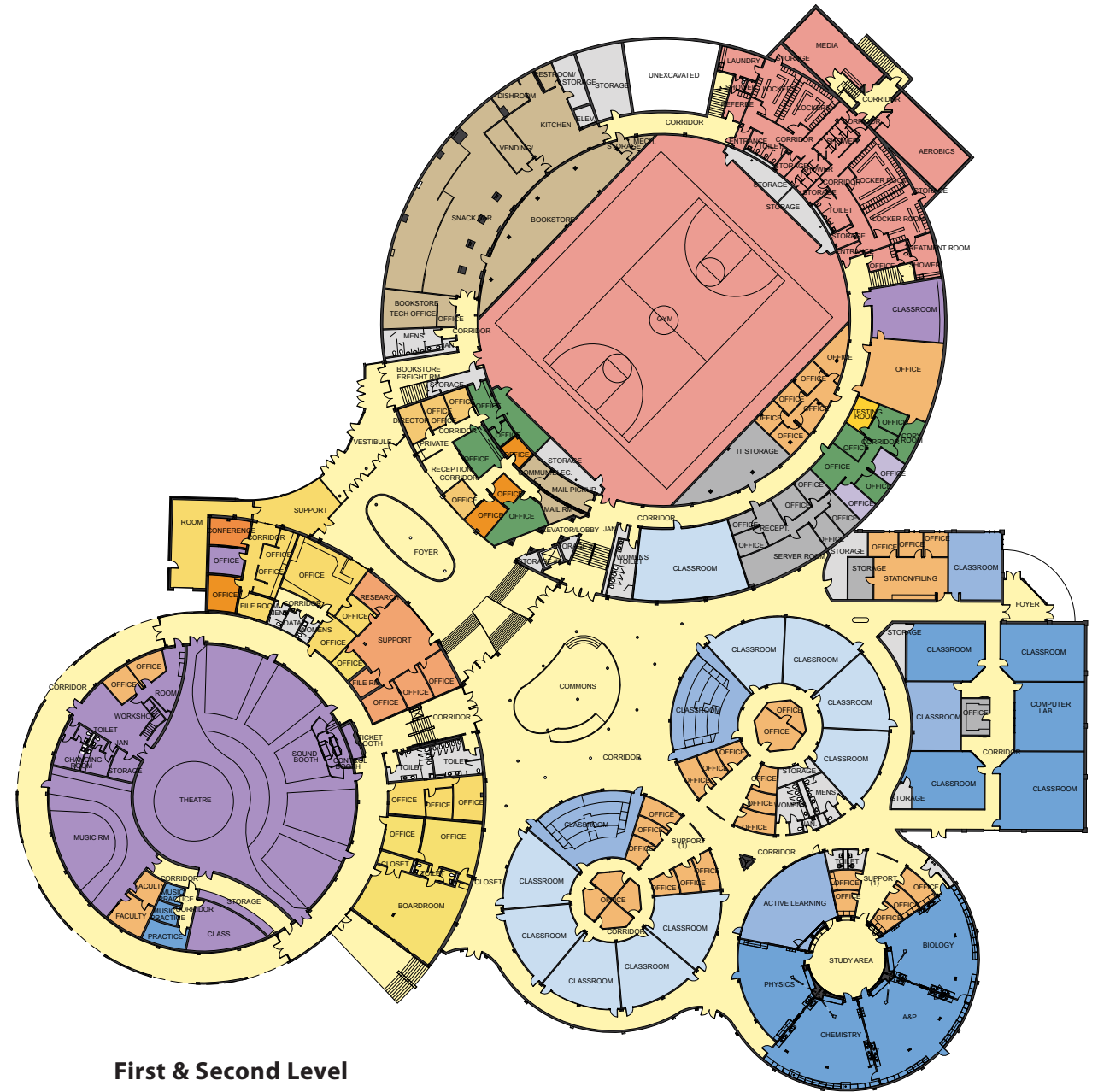


Lower Level

Existing Main Building



Upper Level



First & Second Level

Existing Sidney Main Building



Appendix B

Building Systems Recommendations (MEP)

APPLIED TECHNOLOGY BUILDING

Mechanical/Electrical Recommendations

Immediate Needs

The APTC building has a makeup air unit that has been out of service for several years. This unit needs immediate replacement. This unit serves to supply air to the facility to balance the exhaust that is taken out for various functions and areas of the building. It is important that this unit be replaced as soon as possible.

The College has requested engineering services for this replacement. These services are being provided parallel with the completion of the facility master plan.

Auto Body

1. Upgrade electrical branch circuiting to include additional 208V and 110V outlets.
2. Increase electrical service capacity and branch circuit breaker capacity to facilitate additional resistance spot welders and equipment for future use.
3. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
4. Replace existing compressed air system, provide larger compressor capacity and compressed air distribution lines to existing and supplemental locations.
5. Upgrade existing lighting to include LED high-bay lighting fixtures in the high-bay areas. Provide fluorescent lighting with electronic ballast in low-bay areas.
6. Provide new lighting in auto body paint area. Light fixtures

shall be rated for the hazard rating of the area. Typically, it includes enclosed and gasketed Class 1 Division 2 fixtures.

7. Provide additional branch circuits and receptacles in paint area.
8. Provide data communications infrastructure, including wired and/or wireless data access points.

Welding

1. Provide new electrical infrastructure to welding booth, including outlets and additional branch circuits.
2. Provide new heating and ventilation unit to serve the welding area. This could be done by potentially radiant heat and a ventilation unit on the roof.
3. Upgrade electrical service to provide additional service capacity as well as breaker capacity for branch circuit distribution.

Automotive Repair Area

1. Provide new compressed air system infrastructure, including all-new compressed air distribution piping.
2. Upgrade lighting to high-bay LED and/or T8 fluorescent fixtures with electronic ballast.
3. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

CHILD DEVELOPMENT CENTER

Mechanical/Electrical Recommendations

1. Consider providing a sprinkler system in the facility. This should be done utilizing a professional consulting engineering firm that can develop the scope of work and specifications for the fire sprinkler systems. In addition, installing the fire protection system will require some general construction. Therefore, it is recommended that an architectural firm be part of the team to develop the requirements for the de-

sign and construction of the fire protection system.

2. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
3. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
4. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
5. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

CLARK N. WILLIAMS MULTICULTURAL LEARNING CENTER

Mechanical/Electrical Recommendations

1. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
2. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
3. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
4. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

CONESTOGA RESIDENCE HALL

Mechanical/Electrical Recommendations

1. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
2. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
3. Consideration should be given to the installation of a gas-fired emergency generator to provide life safety power to the Conestoga Residence Hall. This would provide a more reliable source of emergency power. It would also allow the elimination of the battery-powered emergency lighting fixtures currently installed in the facility.
4. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

HARMS ADVANCED TECHNOLOGY CENTER

Mechanical/Electrical Recommendations

1. The HVAC system consists of a significant number of DX split systems. Consideration should be given to developing a central chilled water cooling system for the facility. A central chilled water system may only make sense if the DX systems need to be replaced in a group replacement. It would be a relatively significant capital expenditure to design and install the chilled water system. However, significant energy savings could likely be achieved.
2. Integrate the fire alarm control panel in the Harms Advanced

Technology Center with the campus-wide fire trouble monitoring system located in the main building.

3. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
4. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
5. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
6. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

MAIN BUILDING

Mechanical/Electrical Recommendations

Immediate Needs

During May 2013, the 300-ton chiller serving a significant portion of the main building, including the auditorium, failed. The College contracted for a temporary chiller to serve the main building through the course of the cooling season of 2013.

The College has requested engineering services for replacement of this chiller. The replacement engineering plan will include a long-term strategy for the main building, including adding potential chiller capacity to serve the entire building through chilled water systems after the existing rooftop units have reached the end of their useful life.

In addition, as part of the chiller replacement project, the

controls master plan will have an opportunity to have its first significant segment of implementation. This should be included as part of the chiller replacement project.

Other Recommendations

1. Although often the ASHRAE Remaining Useful Life (RUL) is utilized to determine the equipment replacement periods, oftentimes equipment can go well beyond the RUL with good maintenance. WNCC has done a good job of maintaining equipment and should use multiple factors when deciding the replacement criteria. Replacement criteria includes such items as:

- Availability of maintenance parts
- Energy efficiencies that can be gained by installing new equipment
- Refrigerant types used, including availability, possible penalties for use, and carbon footprints

The investment in the annual budget for ongoing deferred maintenance and equipment replacement should be maintained. However, good judgment should be used in the decision-making process and not simply the RUL definition by ASHRAE.

2. Migrate control systems to campus-wide direct digital controls. Develop campus-wide graphic standards for control screens.
3. Upgrade building ventilation systems to meet current standards.
4. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
5. Continue to integrate all buildings on campus into the Spec-tronics campus-wide fire alarm monitoring system.
6. Consider providing a sprinkler system in the facility. This

should be done utilizing a professional consulting engineering firm that can develop the scope of work and specifications for the fire sprinkler systems. In addition, installing the fire protection system will require some general construction. Therefore, it is recommended that an architectural firm be part of the team to develop the requirements for the design and construction of the fire protection system.

7. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
8. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
9. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

NORTH SHOP AND SHED

Mechanical/Electrical Recommendations

1. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
2. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
3. Fire sprinkler systems should be considered to be added to the north shop building.
4. Install a digital electrical meter for the facility. The digital

electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.

5. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

PIONEER RESIDENCE AND DINING HALL

Mechanical/Electrical Recommendations

1. Consideration should be given to the installation of a gas-fired emergency generator to provide life safety power to the Pioneer Residence and Dining Hall. This would provide a more reliable source of emergency power. It would also allow the elimination of the battery-powered emergency lighting fixtures currently installed in the facility.
2. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
3. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
4. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.

5. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

SIDNEY MAIN BUILDING AND GARAGE

Mechanical/Electrical Recommendations

1. It is recommended that a consulting engineering firm be hired to design the ventilation system for the cosmetology laboratory. The system design should consider how odors can be controlled, how the system can be run in an energy-efficient manner, and how the system can be integrated into the facility in the least disruptive manner.
2. The fire sprinkler system heads should be completely reviewed and defective heads replaced. Sprinkler heads manufactured by Central should be replaced if they were part of the nationwide recall.
3. Add CO2 sensors to facilitate demand control ventilation. Refer to the Campus-Wide Recommendations and Sustainable Strategies discussed elsewhere in this report.
4. Replace manual switches with automatic occupancy sensor switching for lighting systems wherever practical.
5. Install a digital electrical meter for the facility. The digital electrical meter shall be integrated into the campus-wide BMCS that has also been recommended. Understanding the energy consumption, as well as the peak demand, of this facility will allow the college to develop strategies to reduce both energy consumption and demand.
6. Refer to additional relevant recommendations included under the campus-wide recommendations section of this report.

Appendix C

Alternative Energy Technologies

ALTERNATIVE ENERGY TECHNOLOGIES



Photo Courtesy of Alpha Energy

Photovoltaic Panels

Capture available sunlight year-round

Relevance to Campus

Opportunity exists to develop partnerships with Nebraska Public Power District (NPPD) for testing and development of solar power generation in Nebraska. OPPD and Creighton University have such a partnership. (Alvine Engineering was the Engineer for the project.)

Research and development partnership possibilities exist between the University and manufacturers for technology development.

Photovoltaic panels can be integrated with surface parking lots or parking structures which provide a large area to capture sunlight as well as provide shade.

Photovoltaic panel can be deployed on building roof tops or within courtyards and as shading for parking.

Reasons to consider

1. Western Nebraska has an average of 6 to 7 hours of daily full sunlight for power generation.
2. Funding sources are available through grants and partnerships.

3. Utilizes an on-site renewable energy resource for power generation, reducing utility consumption.
4. Creates a tangible message with a visible symbol in the community.
5. Simple to integrate into a building's electrical system or utility grid.
6. The market for solar power in agricultural applications is underdeveloped and could be a source of great opportunity for this development.



Photo Courtesy of Helix Wind Corp

Capturing Wind for Power

Using a natural resource which is plentiful in Nebraska

Relevance to Campus

U.S. Dept. of Energy studies show major areas of good wind resource in Nebraska.

Pedestrian scale "kinetic art" could be developed as a campus amenity.

A demonstration of renewable energy in an exciting way will be a great recruitment tool for corporations and researchers.

Small scale vertical-axis wind turbines have been deployed

as a part of numerous building projects. The current financial incentives are significant.

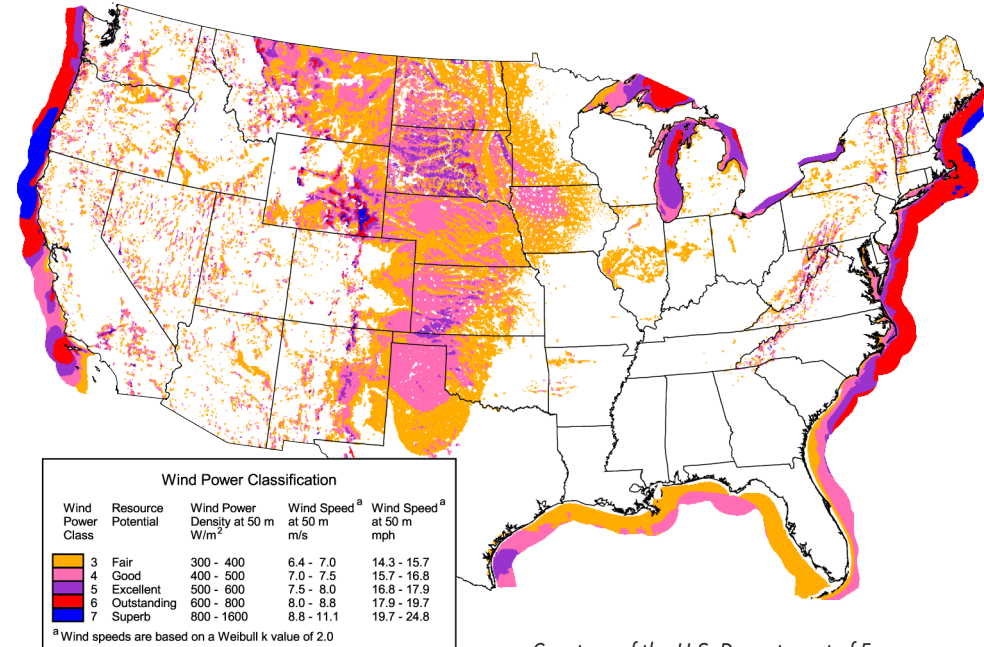
Turbines can be deployed on a modular basis with building development or as a wind "farm."

Defined loads can be served from the renewable energy source creating interest and education for the occupants and visitors to the building.

Reasons to consider

1. Nebraska has a good identified wind resource, much of which has not been tapped.
2. Funding sources are available through grants and partnerships.

U.S. Wind Power Classification



Courtesy of the U.S. Department of Energy

3. Utilizes an on-site renewable energy resource for power generation, reducing utility consumption.
4. Creates a tangible message with a visible symbol in the community.
5. Simple to integrate into a building's electrical system or utility grid.
6. The market for wind power in agricultural applications is underdeveloped and could be a source of great opportunity for this development.



Methane as a Free Fuel

From the landfill or adjacent wastewater treatment facilities

Relevance to Campus

Captures an energy source that may not be fully-utilized.

Can be used to fuel a combined heat and power generation system with microturbines and heat recovery.

Steam can be used for campus distribution system for heating.

Steam can also be used to run absorption chillers to generate chilled water.

A smaller combined heat and power system operating on methane could be installed for a single building as a pilot program. Landfills and feedlots can be sources of fuel.

Reasons to consider

1. May produce power at a cost below retail electricity.
2. Displaces purchased fuels for thermal needs.
3. May qualify as a renewable fuel for green power programs.
4. Enhances power reliability for the plant.
5. Offers an opportunity to reduce greenhouse gas and other air emissions.

Geothermal Project Planning

Introduction

Utilizes the constant temperature of the ground/water as a heat source and/or sink depending on the season, by routing pipe through the ground water.

Nebraska is well-suited for use of geothermal energy, with a mean ground temperature of 55 degrees. Nebraska has excellent balance between heating and cooling seasons, which increases the effectiveness of these types of systems.

There are several types of geothermal installations that are currently available.

- Vertical ground-coupled heat pump system
- Horizontal ground-coupled heat-pump system
- Surface water heat pump system
- Ground water/standing column well system



Technology & Future Trends

Vertical Ground Coupled Heat Pump System

- Ground used to heat source/sink
- Constant ground temperature in Nebraska is approx. 55 deg F
- Borehole depth of 250 to 300 feet deep
- 6-inch diameter borehole containing single loop of pipe with a U-bend at the bottom

Cost (different options to estimate cost)

- \$0.25 per Btu
- \$10 to \$15 per foot of boring
- Cost per ton for loop field is approximately \$3,000
- Well field cost averages approximately \$5.50 per gross square foot of building

Capacity

- Varies based on conductivity of the ground
- Approximately 500 feet of pipe per ton
- Approximately 100 tons per acre (one ton per 250 foot bore – spaced 20 feet on center)

Advantages

- Smaller land area required than horizontal installations
- Less piping required than horizontal and/or slinky installations

Disadvantages

- More expensive to install than horizontal

Operation/Maintenance

- Very little required
- Inexpensive maintenance costs
- Lifespan in excess of 50 years (Iowa Energy Center)

Vertical Ground-Couple Heat Pump System – Thermacouple Earth Energy System

- High-performance concentric-tube type ground heat exchanger
- 300 feet deep, 6-inch diameter bore holes

Cost

- \$5,000 to \$8,000 per bore hole
- \$2,000 per ton

Capacity

- Each bore hole supports 3 to 5 tons
- 500 tons per acre (bore holes spaced 20 feet on center)

Advantage

- More capacity out of same area of land
- Less bore holes / less drilling
- Potential to reduce overall cost by reducing labor and other costs associated with loop construction

Disadvantages

- Very new technology
- Only available through one manufacturer
- Components are more costly

Operation/Maintenance

- Similar to standard vertical ground-coupled heat pump system



Horizontal Ground-Coupled Heat Pump System

- Contractors dig trenches and install the piping horizontally
- The horizontal piping is typically installed 8 to 10 feet below grade
- The pipe may be curled into a slinky shape to fit more in a single trench

Cost

- \$13 to \$17 installed per square foot of building served

Capacity

- 400 to 600 feet of pipe per ton

Advantages

- Easy installation

Disadvantages

- Significant land area is required

- Considerable site excavation and repair; new boring machines are being developed to allow easier access to horizontal boring

Operation/Maintenance

- Very little required
- Lifespan in excess of 75 years (Iowa Energy Center)

Open Loop/Standing Column Well Heat Pump

- System – Aquifer Tap
- Open loop or “pump and dump” geothermal systems are a proven geothermal technology
- Ground water is piped directly from a well or aquifer to transfer heat before it is returned back to the ground via an injection well or within some well/aquifer

Capacity

- The capacity of the system will vary with many parameters, including details of the well/aquifer, delta T, flow rate, etc.
- Based on experience from Water and Energy Systems Corporation, 50 to 60 feet of water column is needed per ton

Advantages

- Only one well is required

Disadvantages

- Ground water must be plentiful for this system to operate effectively
- May require sign-off from local environmental official – EPA concerns

