Long Range Illustrative Master Plan
The New Mexico State University 2006 – 2016 Master Plan is the result of a collaborative process led by the University Architect, Hanbury Evans Wright Vlattas + Company and Studio D Architects. The process included participation from a broad cross-section of campus groups including members of the NMSU’s administration, faculty, staff and students, staff and leadership from Dona Ana County and the City of Las Cruces and local residents. The Master Plan incorporates ideas generated from the more than 125 meetings conducted that explored NMSU’s past, present and future through on-site workshops, focus groups, planning team meetings, presentations and reviews, the planning team’s analysis and evaluation of the campus fabric and the regional context.

The entire planning team is grateful to all who have devoted their vision, time, ideas, and energy to the process of the planning and creation of this effort.

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NMSU Constituent Groups
ASNMSU
Arrowhead Research Park
Campus Facilities Group
Facilities Planning and Construction
Faculty Senate
Administrative Council
Parking and Transportation
Athletics
Grounds
Performing Arts Complex
Native American Cultural Center
Dean’s Council
Housing and Residence Life
Real Estate
University Foundation
University Communications and Marketing

Facilities Operations and Utilities

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Laura M. Conniff - Vice President
Robert Gallagher - Member
Blake Curtis - Member
Sherry Kamali - Secretary/Treasurer
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Executive Summary

New Mexico State University (NMSU) occupies a singular geographic position in the American West located at the intersection of Interstates 10 and 25. From this vantage point it is strategically located to impact both the state and region as it strives to expand its academic and research programs to become one of the top tier research institutions in the United States. NMSU’s mission as stated in Living the Vision: A Performance Plan for Excellence is to serve “the educational needs of New Mexico’s diverse population through comprehensive programs of education, research, extension education, and public service. By the year 2020, NMSU expects to be in the top quartile of its defined peer institution group and expects its student population at the Las Cruces campus to grow to 25,000 head count or 19,500 FTE (fulltime equivalent) within 20 years.

In September 2005 Hanbury Evans Wright Vlattas + Company and Studio D Architects (the Master Plan Team) were selected to lead the NMSU community in developing a master plan to implement the physical and environmental goals of the Living the Vision document. Between October 2005 and July 2006 the Consultants held over 125 meetings with various working groups from NMSU and its statewide centers, and campuses as well as the citizens of the City of Las Cruces with the goal of creating broad consensus in the planning outcomes achieved.

Analysis of the campus indicated seven main issues to address:

1. Expansion of the campus historically has created a 15-20 minute walking distance in the east/west dimension of campus in misalignment to the 10-minute class change schedule.
2. Over time multiple access points have developed with no clear hierarchy or wayfinding method resulting in confusion for visitors and numerous conflicts between pedestrians and automobiles
3. The intersections of Interstates 10 and 25 with University Avenue are the primary arteries of arrival for campus. Arrival on campus is confusing and exposure of the campus from the interstates and University Avenue is generally negatively perceived. Increased positive exposure along these three corridors is essential and traffic calming along University Avenue and wayfinding are needed.
4. Parking is the dominant land use on campus with a surplus of approximately 3000 parking spaces primarily located at the perimeters of campus outside a comfortable walking distance to the academic core. The current operational and business model for parking is outdated.
5. The pedestrian experience is suffering from the lack of shade and appropriately scaled lighting and site furniture. Numerous conflicts between services vehicles and pedestrians occurs everyday due in part to a culture of service vehicles using sidewalks and plazas rather than the service areas of buildings.
6. A benchmarking analysis was performed to establish a target for growth that would bring facilities in line with the target for NMSU to be in the top quartile of its peer institutions. The process included 10 of the 18 peer institutions identified in the Living the Vision document.
7. Include the all campuses and their initiatives in the planning process to establish a clear mandate for NMSU to realize its vision as one university with a statewide land grant mission.

The major recommendations of the master plan include:

1. NMSU should pursue a strategy of infill development within the existing academic core. It should avoid further academic development beyond a 15-minute walking distance in the east/west dimension. The siting of new increments of construction should define civic/open space for campus and not use existing open space. Additional development is desirable towards the south in expanding the core and accommodating future research and academic facilities growth.
2. NMSU should create a new primary entry to the campus at Jordan Street. The University should work with the City of Las Cruces to revise the zoning in the overlay district to create a mixed-use district providing a suitable and desirable urban town/gown condition along University Avenue. The dominance of the automobile should be reduced.
through traffic calming and landscaping. Future development should locate parking to the rear and building entrances towards the street to promote a pedestrian environment. NMSU should further prioritize entries via major streets and institute a clear wayfinding system.

3. NMSU should establish a new signature open space in conjunction with the new entry at Jordan Street that marks what has become the center of the existing campus. This space, initially defined generally by Corbet Center to the east, Zuhl Library to the south and Milton Hall to the west will serve as the ‘living room’ of the university but also as the point of departure for a new major north/south mall that will begin to help define development patterns in the southern portion of campus.

4. NMSU, in collaboration with NMDOT, should support the proposed I-10/I-25 interchange improvements and the creation of a new exit interchange near Cholla Drive at the Arrowhead Research Park. NMSU should thoughtfully develop and landscape its edges along both interstates to create a positive first impression.

5. Begin to establish a parking system that is market driven, where parking is treated as a commodity and convenience is valued at a higher price. Maintain some smaller lots on the interior campus for special needs and service while larger parking lots on the east, west and south side of the academic core that are serviced by a campus shuttle making perimeter parking more convenient to use. Construct a parking garage at the Jordan Street entrance for visitors and convenience parking and potentially a second parking lot in proximity to a future phase of the performing arts and hotel complex.

6. Create a network of pedestrian paths that are shaded either by building elements or canopy trees. Paths should have appropriately scaled lighting and site furniture to make them usable in the desert climate. The International Mall and Frenger Street Mall will serve as the primary east/west paths with new north/south paths providing access to the southern expansion of the academic and family housing districts to the core.

7. Meeting the goals of the Living the Vision document will require approximately 2.5 million gross square feet (GSF) of new and critically needed facilities exclusive of residence life on the Las Cruces campus. This development will begin with infill development on the core campus and move south.

8. The master plan also recognizes planning initiatives at the Alamogordo, Carlsbad, Dona Ana, East Mesa and Grants campuses to expand their two and four year programs.

To address these recommendations the Master Plan recognizes eight districts on the Las Cruces campus. The planning respects existing open spaces while accommodating the opportunities for pedestrians.

**University Avenue District 1**

University Avenue establishes the northern boundary of the campus. The master plan envisions University Avenue as a rich pedestrian environment where the City and the University work together to encourage mixed use development that serves faculty, staff and student needs. The street itself would be transformed from a primarily car dominated environment to one where both pedestrians and vehicles are equally at home. The City of Las Cruces appears ready to modify the governing overlay district rules to encourage mixed use development that places buildings with sidewalks and a landscape edge adjacent to the street and puts parking behind. A landscape median is proposed in the center of the street to calm traffic speeds and provide pedestrians with a place of refuge at crossing intersections. A bike lane on both sides of the street would encourage bike use and potentially help reduce the number of cars on the street.

The University would address University Avenue by placing future buildings such as the additions to the Business and Health and Human Services Buildings with orientations that address both the street and the campus. A landscape verge for shade trees would be placed along the street with sidewalk adjacent and pedestrian scaled lighting. The University will place its new Performing Arts Complex at the corner of University Avenue and Espina Street. This venue will help to create an extended use cycle on University property that will be a catalyst for private sector commercial development on the north side of the street.

Additionally, the University is proposing a reconfiguration of the entrance at Jordan Street that will serve as the primary entry and means by which visitors will enter campus. New mixed use buildings will be placed on either side of Jordan Street that will provide student-related retail and services at the 1st floor level with graduate housing at the 2nd and 3rd floors. A multi-story garage is proposed at the current location of parking lot 16 that would allow visitors easy access to parking eliminating the need for many of the small lots in the area.

The Plan recommends that new commercial development be placed in front of the existing Pan Am Plaza creating a pedestrian scale development along the street. A new pedestrian plaza is envisioned at the northeast corner of University Avenue and Locust Street in front of the Bennigan’s Restaurant. Parking would remain in the center of the development with any replacement parking required placed on the east side of the existing strip center.

The City and the University are exploring the opportunity to co-locate the City’s proposed Las Cruces Center and the University’s proposed hotel/conference center on the western end of the campus. This paring of these complementary programs would help make them an attractive business model for a private sector partner. Location of both facilities in proximity to both University Avenue and the proposed performing arts complex may make a second parking garage necessary in the future.

**Existing Housing District 2**

The Plan proposes that new graduate housing would be located along the south side of University Avenue at Jordan Street to take advantage of the commercial activity and that single graduate student’s desire. Monagle has been designated to be removed within 10 years and a new freshman residence hall be constructed similar to Pinon Hall opening in fall 2006. Rhodes, Garrett and Hamiel and Garcia Halls would
Land Use & Circulation Overlay
remain; phase 2 of the single student apartments will be located on the remainder of the current Alumni Dorms site. The reinvention of the open space surrounding the Regents’ Grove is envisioned by reshaping the duck pond into a multi-level water feature that should be designated to assist with storm water management.

The Native American Cultural Center takes advantage of a unique place on campus to meet its programmatic needs for adjacency to student housing, commuter parking, the amphitheater on the east end of Corbet Center, water and open space with views to the mountains. Expansion of the existing duck pond is recommended to bring this popular amenity down into the Regent’s Lawn and to increase its visibility and make it more proximate to the Center. The knoll on which the Center is to be placed affords excellent views to the Organ Mountains and a commanding presence on the Lawn. Relocation of student services from the Educational Services Building to the new entry area at Jordan Street is also imagined.

New Housing District 3
The Plan proposes that the existing recreation fields be expanded south across Wells Street and that family housing be relocated from the zone adjacent to Interstate 10 to areas on the east and west side of the recreation fields. Existing softball, baseball and track facilities would be relocated to a new athletics district on the west side of Interstate 25. Support facilities should similarly be relocated to the east campus. Existing observatories would be relocated to an area where light pollution is at a minimum. Family housing is an important market currently on campus but a thorough housing strategic plan needs to be undertaken to examine what markets need to be served within the timeframe of the master plan and what type of units will be needed on campus to serve that market. The Master Plan proposes that new family housing would need to be based on a different model than the current single family units. Some combination of flats and townhouses are possible with common playgrounds for small children and shared green spaces for community events.

Academic District 4
The Plan recognizes the existing Academic District of campus and proposes several infill opportunities and potential selective demolition of buildings or the removal of small parking lots. The facilities plan requests six new buildings within this zone and one outside this zone:

- Gardner Hall renovation and expansion (2006 – 2007)
- Native American Cultural Center – outside academic District (2006 – 2007)
- Arts Complex – Phase I, II and III at Corner of Espina and University Avenue (2007 – 2008)
- Student Services Facility – North side of Milton Hall (2008 – 2009)
- Technology Lab/Classroom Facility – Current site of Jacobs, Hardman and Zohn
- College of Business Building – Current location of parking lot 11
- College of Education Expansion – West and South side of O’Donnell Hall

A new campus green is proposed between Milton Hall and the Corbet Center central core space of campus creating nexus of activity where the two existing main east/west pedestrian paths intersect. Milton would remain in the near term years but as new classroom buildings are built providing replacement space for its programs it could be removed allowing the space to grow and achieve its full potential as a major green space. Potential demolition of the latest addition to Breland Hall and preservation of its historic building could provide an expansion site for the Zuhl Library allowing renovation of Branson Library and/or its conversion to another use. Additional phases of the Performing Arts Complex are proposed within the 20 year time frame on the north side of Skee Hall. A parking structure will most likely need to be constructed with the project.

Academic / Research District 5
While near term academic expansion is accommodated within the existing academic district The plan proposes that an Interdisciplinary Academic / Research District be designated in the area south of Stewart Street where family housing currently exists. This zone would accept the bulk of new academic and interdisciplinary research expansion for the campus allowing NMSU to expand it facilities and remain within a comfortable walking distance to the core of campus. This location also provides NMSU with excellent visibility from I-10 and creates both visual and practical links between Arrowhead Research Park and the campus.

The University seeks to support multi-disciplinary behaviors through the creation of facilities that are not owned by college or department but focused on one of the University’s research clusters as delineated in the Living the Vision document. The occupancy of these facilities shall be determined through regularly reviewed productivity measurements.

Arrowhead Research Park District 6
Poised at the intersection of two of the most significant interstates in the American west, Arrowhead Research Park is a critical resource to NMSU not only to accommodate the immediacy often required by potential research partners but is a means of visibility from the interstates to showcase NMSU’s commitment to advancing research and economic development. The park allows flexibility to the University to develop new partnerships quickly with private sector entities developing emerging technologies and it provides critically needed swing and surge space for newly acquired grants allowing the development of lab space outside the state funding paradigm. With the anticipated rise of the civilian space industry and continuing ties to White Sands Missile Range, Arrowhead allows NMSU the potential to respond quickly to immediate needs.

The plan recommends that the 272-acre park be fully developed and indicates the potential for approximately 2.3 million GSF exclusive of the area currently occupied by the greenhouses. With this area included the potential for the park is approximately 3.0 million GSF. With the potential for a second interchange on I-25 the plan proposes to extend the current park access road northward to intersect with Wells Street at the football stadium.
Athletic District 7
The plan recommends the relocation of athletic venues to the area east of the existing football stadium. This allows for much needed growth in the programs to include a soccer stadium and soccer practice field as well as new softball and baseball stadium complexes adjacent to ample event parking. The zones to the north and south of the stadium including the parking in front of the Fulton Center could then be replaced with public space that could be used on game days and for other special events. This district needs to convey strongly positive visuals of the campus for arriving visitors.

West Campus District 8
The western end of campus has historically been identified with NMSU’s agricultural heritage. The master plan celebrates this heritage setting aside a portion of the current cultivated land as a heritage landscape to be used for cultivation and pasture with well-maintained and appropriate fencing at the road edges. The plan also recommends that a new entrance boulevard be created as the primary entry into campus from the I-10 end of University Avenue. The new boulevard would be a four-lane divided road with pecan tress planted on both sides.

A large at-grade parking lot is proposed on the western side of Knox Street to accommodate commuter students, faculty and staff and to support infill development proposed in Districts 4 and 5. Frenger Street Mall would be extended to this lot to provide a shaded pedestrian path to the academic zone.

East Campus District 9
The plan recognizes significant long term growth opportunities on the east campus. The county Metropolitan Planning Organization has recommended the southern extension of Sonoma Ranch Boulevard connecting NMSU to the rapidly developing northeast area of Las Cruces.

Currently home of the University golf course, president’s home, farm and ranch museum and rodeo complex the plan establishes the following program for the 1,800-acre site:
- 18-hole golf course expansion
- Future outreach site adjacent to the golf course
- New president’s home adjacent to the Las Alturas neighborhood
- Alumni Center in proximity of the new president’s home
- Special purpose housing zone within the fee-simple property boundary
- Relocated services yard, support facilities and shops
- Academic research zone – potential expansion for Arrowhead Research Park
- Preservation of A Mountain as a permanent preserve
- Land bank for future growth and passive recreation.
Workshop with Executive Staff

Workshop with Housing and Residence Life

One on One Explanations
In September 2005, NMSU commissioned Hanbury Evans Wright Vlattas + Company (HEWV) and Studio D to assist in the development of the 2005 – 2015 Master Plan Update. HEWV and Studio D in association with SWA (Landscape Architects), Zia Engineering and Environmental Consultants, LLC (Civil), Affiliated Engineers, Inc (Infrastructure), Chance Management (Access Management Advisors (Parking and Transportation) and Paulien & Associates (Benchmarking) (Design Team) took up the challenge to define a framework for how future growth demands would shape NMSU in the coming years.

The undertaking included input from a cross section of NMSU’s faculty, staff, and students as well as interested citizens and staff with the City of Las Cruces and the MPO. Between October 2005 and July 2006 the Design Team led over 125 workshops with various constituency groups to understand the needs and expectations, as well as the aspirations for what the campus could become. Oversight of the day to day aspects of the planning process was provided by the University Architect’s office and the executive staff. The Design Team regularly reported its findings to President Mike Martin, Provost William Flores, Senior Vice President for Planning, Physical Resources and University Relations Ben Woods and University Architect Michael Rickenbaker. Regular updates were provided to the Campus Planning Committee to create a consensus of realistic expectations for the plan and to provide critical review and guidance of its conclusions. NMSU’s Board of Regents provided meaningful input regarding larger campus issues at the end of the inventory, analysis and concept phases. The resulting master plan is a framework for development on NMSU campuses statewide in keeping with the goals established in Living the Vision: A Performance Plan for Excellence.

Meetings and workshops were held every two to three weeks between October 2005 and June 2006. The typical duration of each workshop was between three and four days and occurred primarily in the Corbet Student Center TV lounge to insure that the process was visible and open to the campus.

The following groups or individuals provided critical input to the proposals contained herein:

- Administrative Council
- Arrowhead Research Park Group
- ASNMSU
- Athletics Group
- Campus Facilities Group
- Campus Planning Committee
- Campus Grounds
- Campus Police
- City of Las Cruces Planning Staff
- Dean’s Council
- Department of Animal and Range Sciences
- Dona Ana County Metropolitan Planning Organization
- Housing and Residence Life
- Facilities Planning and Construction
- Faculty Senate
- Lac Cruces Center Planning Group
- Native American Cultural Center Committee
- NMSU – Alamogordo
- NMSU – Carlsbad
- NMSU – Dona Ana Community College
- NMSU – Grants
- NMSU Planning Committee
- Parking and Transportation Committee
- Performing Arts Complex Committee
- University Communications and Marketing
- University Foundation
- University Real Estate

Workshops Open to Broader Campus Community
Workshop Among Design Team
Workshops with Students
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To achieve current 75th percentile: 29 ASF x 12,592 FTE = 365,168 ASF (522,000 GSF) or a 16% increase

To meet target of 19,500 FTE enrollment: 213 ASF x 19,500 FTE = 4,153,500 ASF of non-residential space = 1,836,000 ASF (2,623,000 GSF) of new space or an 80% increase
Benchmarking is a metric to help an institution make the comparisons necessary to measure outcomes and achievements that will promote institutional improvement and change. As part of the master planning effort NMSU undertook a benchmarking study to quantify the changes necessary to meet the goals of the *Living the Vision* document.

The study first evaluated the ranking of NMSU and eight of its peer institutions over a range of key indicators to determine the level of performance needed to achieve ranking in the top quartile. Second, the study compared campus facilities in assignable square feet (ASF) per student and ASF per faculty in comparable colleges at the peers to the facilities at NMSU in order to determine the amount of new space needed to accommodate both the ranking and a target student population of 25,000 by the year 2025. The eight peer institutions evaluated were:

1. University of Arizona – Tucson
2. Louisiana State University – Baton Rouge
3. University of Missouri – Columbia
4. Oregon State University – Corvallis
5. University of Texas – El Paso
6. Virginia Polytechnic Institute and State University – Blacksburg
7. Washington State University – Pullman
8. University of Wyoming – Laramie

The results of the benchmarking study suggest that in order for NMSU to reach the top quartile of its peer institutions based on its current student population it must increase its ASF per student FTE (full-time equivalent) by 522,000 GSF or an increase of 16% based on today's comparisons. Based on a target of 25,000 students within 20 years or 19,500 FTE an increase in campus facilities of 2,623,000 GSF or 80% is required. These numbers include both academic and support spaces exclusive of residence life facilities.
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Discussions with the City of Las Cruces about the location of the Las Cruces Center on the west campus have resulted in the decision to locate a proposed University-owned hotel/conference center in proximity to both it and the Performing Arts Complex. Specific time frames have not been assigned for these projects.

Within the 20-year time horizon the program identifies the following to meet the targets reflected in the benchmarking study:

- Approximately 1.6 million GSF of academic/research space;
- Phase 3 of the Performing Arts Complex (2,000-seat performance space);
- Baseball stadium relocation;
- Softball stadium relocation;
- Family housing replacement;
- Expansion of Arrowhead Park;
- Relocation of Campus Support Complex

Additionally, specific projects associated with the idea of developing Jordan Street as the primary entrance for visitors on University Avenue and the creation of a new campus core green space include two mixed-use buildings one each located on either side of Jordan Street/University Avenue intersection, a multi-level parking structure on Parking Lot 16 and a central pedestrian green space at the current location of parking lots 17, 17N & 45.

The Master Plan Team worked with University leadership to establish a program that would reflect both near-term priorities and the future condition anticipated to meet the goals of the Living the Vision document as determined by the benchmarking study for the Las Cruces Campus. NMSU’s 2006 - 2011 Five-year Facilities Plan reflects forthcoming requests for capital outlay through the legislative process and will be presented to the New Mexico Higher Education Department for review, prioritization and inclusion in the legislative recommendation. It is anticipated that these projects will comprise a portion of those funded and built at least in part with state funds within the 10-year horizon of the master plan. The projects on this list include:

- Gardner Hall expansion and renovation;
- Native American Cultural Center;
- Performing Arts Complex phases I, II and III;
- Student Services Facility;
- Technology Lab/Classroom Facility;
- College of Education expansion phase 2; and
- Expansion to the College of Business.

Other program elements were identified during various focus group meetings that could be accomplished within the 10-year timeframe including:

- Student activities center expansion;
- Phase IV of the Performing Arts Complex;
- Equestrian/Livestock Arena (AG Comlex);
- University club;
- Soccer complex;
- Monagle Hall Residence Hall replacement;
- Phase 2 of student apartments replacing Alumni Dorms
- Greek Housing complex replacement
- Expansion of Arrowhead Park
- Golf course expansion of 18-holes;
- New residence for the President; and
- Alumni center

Program Distribution

![Program Distribution Chart]

State-wide Campuses

Programs for the state-wide campuses are specific to their location, economic development needs and workforce training and academic mission. Their funding is independent of the main campus at Las Cruces and is provided through local taxation of their host community through the Branch Campus Act (1960s). The Master Plan Team met with the executive staff of each campus in order to understand each campus’s issues and reflect their unique campus requirements.

NMSU – Alamogordo

NMSU Alamogordo serves a host community population of approximately 35,000 residents. The main industries in Alamogordo are the hospital, the campus, various service industries and Holloman Air Force Base with population growth mainly seen through the influx of retired military personal. Enrollment growth is generally slow but the campus experienced 5% growth between fall 2004 and fall 2005. Enrollment is expected to grow from 1,900 (current head count) to 2, 500 within ten years. Academic program expansion is expected in distance education, continuing education for retirees and targeted vocational clusters with the goal of offering...
bachelor’s degrees in Applied Sciences and Fine Arts. Projects anticipated within 10 years are a one-story 5,000 GSF academic support building to be located on the area east of the existing administration building and a two-to-three story, 15,000 GSF allied health sciences center to be located on the northwest side of the existing library.

Long term campus growth reflects anticipated potential program needs and includes:

• Move parking to the perimeter of campus to accommodate infill with growth;
• Combine all student services into one building with expansion of the bookstore to accommodate future academic growth;
• Expansion of the student union to accommodate a small restaurant;
• Expansion of the library;
• High tech center for vocational education to be located adjacent to the Tays Center to include mechanical and building trades, office for a city and county small business development center, Arrowhead Center branch office, incubator space and agriculture extension office;
• Classroom building to be located on the south side of the existing Faculty Office building;
• Multi-purpose center to be located on the ridge on the east side of the existing Nursing/Tech education center to include a CEO residence, conference center, large reception area, and 1 to 2 guest apartments for visiting faculty and Fulbright scholars;
• Tays Center addition to include weight room, showers, locker room, aerobics center, basketball/volleyball competition space, and storage; and
• Private developer student housing.

NMSU – Carlsbad

NMSU Carlsbad serves a host community population of approximately 55,000 residents in Eddy County and a significant portion of students from the neighboring city of Artesia. The main industries in the area are in oil and natural gas exploration and agriculture although tourism is an untapped potential the area being ideal for eco-tourism, mountain biking, caving, hiking and rock climbing. Pot Ash mining considered to be strong but with only a 10-year lifespan and in Artesia, to the north, is a center for federal law enforcement training.
Enrollment for the academic year 2005-06 was 1,200 students down 8% from the previous year but the 10-year projection for enrollment is expected to be between 1,500 – 1,800 students. Projects anticipated on the Carlsbad campus with the 10-year time horizon include 15,000 GSF instructional building to include:

• A 500-seat instructional theater/performance space/creative media institute screening facility;
• Four to six general purpose classrooms;
• 3,000 to 4,000 SF nursing lab;
• Childcare facility for 25 – 40 children in the 2 – 5 year old range as a cognitive center for the early childhood development program; and
• Student health clinic.

Long term campus growth reflects anticipated program needs and includes:

• An Artesia campus for 1,500 students with comparable programs to the Carlsbad campus;
• A research entities building for graduate work from the Las Cruces campus;
• Academic expansion based on exploitation of local synergies including ground water, geological structures, wildlife sciences, clean energy, biomass technologies and hospitality/restaurant services; and
• Development of 4-year degree programs in elementary education, agricultural research, geology (related to oil and gas exploration) and engineering (capitalizing on the high percentage of PhDs in the local population due to proximity to the Los Alamos and Sandia national laboratories.

### NMSU – Grants

NMSU Grants serves a host community population of approximately 9,000 residents in the city of Grants and 25,000 residents in Cibola County. Enrollment for the academic year 2005-06 was 670 students (head count, 400 FTE) but long-term growth is anticipated as determined by a 2% growth in local high school graduation rates. One factor that may also impact local growth and therefore NMSU Grants’ growth is the potential impact of a future phase of the Governor’s proposed bullet train. It is believed that the train would make outlying communities to the west of Albuquerque more appealing to developers seeking inexpensive real estate. Since some current commuter students are choosing to drive to Grants to NMSU rather than face the traffic associated with UNM in Albuquerque the resulting confluence of factors would necessitate and expansion of facilities at the Grants campus.

Expansion needs include more classroom space, expanded child development center capacity to accommodate night classes, separate workforce and continuing education program space, space for welfare-to-work program, expansion of student government organization to include a small kitchen and individual and group study space, classroom and computer lab for distance education students. Projects currently planned include the renovation of the Fidel Activities Center to provide expanded community space and renovation of Martinez Memorial Hall to provide a cafeteria, TV lounge and improved faculty and administrative offices. It is highly desirable that a signature architectural character be established that reflects the cultural heritage of the region which is approximately 1/3 Native American, 1/3 Hispanic and 1/3 a mixture of others.

Long term campus growth reflects anticipated program needs and includes:

• Relocation of parking to the perimeter of campus;
• An amphitheater for traditional festivals and special guest speakers on the up-slope of the mesa;
• Transformation of the core campus to include pedestrian amenities, a center green space connecting campus buildings, regional art and landscaping reflecting the southwest environment;
• A library as a campus focal point;
• An astronomy center on the up-slope of the mesa;
• An adult basic education center – potentially located in the two single-family residences on campus;
• A new child development center that is not located on a parking lot;
• Wellness center to include a student lounge, recreation and fitness space;
• Classroom building to included larger capacity general classrooms with potential area for expansion of the current nursing program;
• A separate facility for the building trades to mitigate the smells associated with automotive and welding work; and
• A hostel-type housing facility for commuter students, Fulbright scholars and visiting faculty.

### NMSU – Dona Ana Community College

NMSU Dona Ana serves the residents of Dona Ana County with campuses at NMSU Las Cruces (Central Campus) and in East Mesa and centers at Sunland Park, Gadsden and White Sands. Due to the relatively limited land resources for academic expansion and limited parking adjacent to the Central campus, expansion potential was identified to the Master Planning Team as occurring only on the East Mesa campus where ample room for both exists. Currently, phase I and II are complete. The current master plan developed in August 2006 by the Williams Design Group and SMPC Architects indicates four additional phases of development to complete the core campus with future facilities to include two community buildings and large parking lots located to the west and south of the Phases 1 – 6 and a recreation building, fields and parking lot located to the east.

### NMSU Science Centers and Extension Offices

NMSU Science Centers and Extension Offices will continue to adapt and serve their host communities. It is strongly recommended that a classroom/instructional space be incorporated into each facility to promote the expansion of their teaching role and take advantage of the staff personal of each facility.
Goals and Planning Objectives

As the state’s land grant university, NMSU’s mission is to serve the educational needs of the citizens of New Mexico by providing a comprehensive program of education, research, extension and public service. To achieve this mission as announced in Living the Vision: A performance plan for excellence NMSU has set a goal that by 2020 it will be among the top quartile of their defined peers institutions on 80% of identified measures of academic program and teaching quality, faculty quality and research productivity, and economic benefit to New Mexico.

The goals and objectives as defined in Living the Vision are as follows:

1. NMSU will be the “University of Choice” for undergraduate education in New Mexico and be the best among all NM four-year institutions in each measure with objectives to:
   a. Enroll the highest proportion of undergraduate students from each New Mexico county
   b. Achieve diversity among undergraduate students, faculty and staff similar to New Mexico’s demography
   c. Enroll the highest proportion of students from New Mexico two-year institutions
   d. Consistently meet or exceed New Mexico’s Accountability in Government Act Targets for the four-year campus
   e. Increase access to two-year and four-year academic degree programs through distance education modalities

2. NMSU will be nationally and internationally recognized for its academic programs with objectives to:
   a. Attract increasing numbers of well-qualified students at all academic levels
   b. Enroll a competitive proportion of degree-seeking international and out of state graduate students
   c. Enroll a competitive proportion of in-state degree-seeking graduate students
   d. Retain a competitive percentage of students to degree completion at all academic levels
   e. Provide faculty in adequate numbers to assure quality teaching and academic support for students at all academic levels

3. NMSU will have a high quality, diverse faculty, staff and student body with objectives to:
   a. Achieve diversity among faculty and staff similar to peer institutions
   b. Attract and tenure faculty with terminal degrees similar to peer institutions
   c. Develop and maintain a comprehensive compensation package competitive with peer institutions
   d. Achieve diversity among students at other academic levels similar to peer institutions

4. NMSU will be nationally and internationally recognized in research and creative activity with objectives to:
   a. Obtain increasing levels of external funding for research, creative activity and other sponsored programs to achieve parity with peer institutions
   b. Demonstrate faculty participation in research and creative activity similar to peer institutions
   c. Develop and support four nationally and internationally recognized interdisciplinary research clusters through external funding

5. NMSU will serve as an engine for economic, social, educational and community development in New Mexico with objectives to:
   a. Increase technology transferred from university research and creative activity to New Mexico business through Arrowhead Center, Incorporated
   b. Develop and support cooperative extension to facilitate community development
   c. Increase number of two-year to four-year academic programs for adult students
   d. Facilitate access to four-year academic degree programs through 2+2 programs at all New Mexico community colleges
   e. Consistently meet or exceed all New Mexico’s Accountability in Government Act Targets for two-year campuses

6. NMSU will be an excellent steward of all resources dedicated to achieving the vision of the University with objectives to:
a. Increase percentage of alumni donors to achieve parity with peer institutions  
b. Allocate resources for instruction, research, service, and administration similar to peer institutions  
c. Attract endowed funds to achieve parity with peer institutions  
d. Consistently meet or exceed all state fiscal watch financial ratios  
e. Allocate resources to reflect increases and decreases in enrollment, formula funding and student credit hours generated

Achieving these goals within the stated timeframe NMSU anticipates growth in the student population of the Las Cruces campus to 25,000 students with an overall campus population exceeding 32,000 including faculty and staff. This expected growth will necessarily result in an aggressive program of construction to expand NMSU’s instructional, research and support facilities increasing campus density and placing pressure on campus open spaces.

In response to this it is NMSU’s goal to preserve and enhance existing open space and create an abundance of outdoor rooms for a variety of uses including informal meetings and gathering, passive recreation and outdoor classrooms. Key to the use of the outdoors is creating shade for student areas and pedestrian paths as well as abundant comfortable seating. Appropriately scaled site lighting should be used for all pedestrian paths and along University Avenue and incorporate absolute cut-off technology to improve the quality of light on campus and the perception of safety.

Anticipating these challenges NMSU enunciated several goals for the master plan:

- The campus should be convenient, well-organized and accessible to the public to fulfill its land grant mission
- The University should increase its visibility in the region and state by improving its image from Interstates 10 and 25
- Campus entry points need to be clearly prioritized and identified and provide information wayfinding
- Academic growth should be focused on interdisciplinary clusters with proximity to the campus core
- The campus should remain pedestrian focused with ample shade, seating and informal gathering places along paths
- The campus should reflect the culture of southwest New Mexico providing a safe and intellectually stimulating environment for students to explore change.
- Campus landscapes should be reflective of the region and be sustainable.
- NMSU and the City of Las Cruces should cooperate to calm traffic on University Avenue and make it more pedestrian-friendly
- The university should influence outcomes on the north side of University Avenue to create a town/gown edge that has a pedestrian oriented, supportive commercial urban fabric
- The east campus should be maintained as a land bank for long term growth and support facilities

View of Proposed Improvements along University Avenue
Map Legend

1. Agriculture Science Center at Artesia
2. Corona Range and Livestock Research Center
3. Agricultural Science Center at Los Lunas
4. Sustainable Agriculture Science Center at Alcalde
5. Agricultural Science Center at Clovis
6. Agricultural Science Center at Tucumcari
7. Clayton Livestock Research Center
8. Mora Research Center
9. Agricultural Science Center at Farmington
10. Las Cruces area Science Centers
    a. Chihuahuan Desert Rangeland Research Center
    b. Leyendecker Plant Science Center
    c. Fabian Garcia Research Center
NMSU is a comprehensive research institution dedicated to providing a quality educational experience to the citizens of New Mexico. A contemporary theme of the University is “One University” and with almost 96,000 acres of land statewide, NMSU has campuses in Las Cruces, Alamogordo, Carlsbad, Dona Ana (Dona Ana County) and Grants, twelve agricultural science and research centers strategically placed throughout the state and 33 extension offices, one in every county. Since its creation as New Mexico College of Agriculture and Mechanic Arts under the Morrill Act in 1889 NMSU has committed its intellectual capital to the improvement of life in New Mexico. Since its creation as New Mexico College of Agriculture and Mechanic Arts under the Morrill Act in 1889 NMSU has committed its intellectual capital to the improvement of life in New Mexico. With a Fall 2005 enrollment of 16,072 students on the Las Cruces campus and an additional 10,319 students combined on the statewide campuses, NMSU is dedicated to teaching, research and service at the graduate and undergraduate levels.

Las Cruces Campus

The Las Cruces Campus is located at the southern boundary of the City of Las Cruces at the intersection of Interstates 10 & 25, two of the most important highways in the western United States. Separated by I-25 the west campus consists of 900 acres with an additional 2,500 acres east of I-25. The west campus contains the primary academic, residence life, and sports facilities; the east campus is predominantly an open space reserve but is home to the university golf course and club house, farm and ranch museum, rodeo facilities and president’s home.

The campus’s provides 77 baccalaureate degree programs, 50 master’s degree programs, and 22 doctoral programs. It has a growth target of 25,000 students in Las Cruces by 2025 with a short-term target of growing its graduate student population by 1,000 students.

Alamogordo Campus

The Alamogordo Campus consists of 511 acres located on a hillside in the northeast quadrant of the City of Alamogordo and offers its students a two-year traditional education as well as course work in occupational and technical programs. Currently consisting of thirteen buildings the main academic campus (containing 12 buildings) is separated from its multi-use building (the Tays Center), a land bank area and campus remote parking by Scenic Drive.

Current enrollment is approximately 1,900 head count (1,000 FTE). Growth targets for 10 years is 2,500 head count with an anticipated growth to 3,000 - 3,500 students in 20 years. Academic growth will include distance education, continuing education for retirees, vocational clusters and bachelor degrees in applied sciences and fine arts.
Carlsbad Campus
The Carlsbad Campus is approximately 122 acres located north of the City of Carlsbad on US 285. With a current enrollment of approximately 1,200 students it is anticipated that this would grow to 1,500 - 1,800 students in 10 years. Offering its students a two-year traditional education as well as course work in occupational and technical programs its academic facilities include a central administrative/classroom building, a smaller instructional building and a computer/electronics center. Also, located on an adjacent parcel of the campus is the Carlsbad Environmental Monitoring Research Center (CEMRC), a post-graduate research extension of the NMSU Las Cruces College of Engineering.

Dona Ana Campuses
The Dona Ana Campus has 5 locations in Dona Ana County: the central campus on the western edge of the NMSU Las Cruces campus, the East Mesa Center (60 acres), the Sunland Park Center (17 acres), the Gadsden Center (22 acres) and the White Sands Center (located in Building 464 at White Sands Missle Range). Dona Ana offers its students associates degrees in traditional education programs, and course work in occupational and technical programs. Between 2001 - 2005 the central campus has seen 10% growth per year with a total of 60% growth since 2000. Enrollment fall 2005 was 4,500 with 2/3s of students carrying a full-time class schedule and 1,500 - 2,000 also taking classes at the NMSU main campus.

Future growth of facilities is not planned for the central campus or centers deferring all future growth to the East Mesa Campus where land is more abundant and expansion of facilities is progressing per their current master plan.

Grants Campus
The Grants Campus sits on 40 acres located at the base of Mount Taylor on the north side of the City of Grants and currently offers its students a two-year traditional education, course work in occupational and technical programs and some bachelor’s and masters degree programs. The campus is a former Job Core site and currently uses two of the original buildings: the McClure Educational Center for instructional space and building maintenance shops and the Fidel Activities Center as a gymnasium/multipurpose facility. Martinez Memorial Hall completed in 1978 provides both administrative and classroom space, faculty offices, library and cafe. Other campus buildings include a small child development center and two small single family houses that were constructed as vocational technology projects. Current student population is between 650 - 670 head count or 400 FTE.

Agricultural Science and Research Centers
NMSU utilizes 12 agricultural science and research centers to take advantage of New Mexico’s varied environmental conditions to meet the agricultural and natural resource management needs of the communities in every part of the state. Comprising almost 91,000 acres of land devoted to agricultural research, these centers are the principle research units of the College of Agriculture and Home Economics interacting with each other and with various state and federal agencies to provide opportunities for research for the benefit of the citizens of New Mexico. They support fundamental and applied science and technology research in the economic, social and cultural aspects of agriculture, natural resources management and family issues.

Extension Offices
NMSU has extension offices in all 33 counties in the state providing education, training and leadership to meet their local communities needs. They provide programs in a wide variety of subjects including but not limited to family dynamics, nutrition and food safety, leadership in local 4-H organizations, preservation of local history and culture, information on invasive/noxious weeds and pesticide applicator training and training for local officials in public administration, leadership, budget management and media relations.
Recommended Demolition Plan
Proposed Plan

The proposed plan is a result of input from a wide cross section of the NMSU community: students, faculty, staff at both the planning and executive levels, local officials and interested citizens. The plan provides a framework that meets the goals set out in the Living the Vision document to move NMSU into the top quartile of its peer institutions, accommodate a student population of 25,000 by the year 2025 at the Las Cruces campus and to grow the statewide campuses, centers and extension offices in a way that allows them to meet the needs of their host community’s residents and the citizens of New Mexico at large. The plan relies on several factors:

Demolition of outdated and inefficient campus buildings;
Removal of buildings that do not adequately contribute to the space needs for a specific site or program requirement;
Relocation of existing uses to other areas of campus or other
campus properties;
New programming models for academic, research and service facilities; and
Infill and new building development that creates a hierarchy of open spaces, preserve campus views, and maintains a walkable campus.

Demolition and Obsolescence
Current growth projections suggest that NMSU will have 25,000 students enrolled by the fall of 2025 with an overall campus population of 32,000 including faculty and staff. In order to accommodate this growth, the Master Plan needed to accommodate the new instructional and research space that would be needed while enhancing the campus’s pedestrian character of rich open spaces and intimate courtyards.

Interviews with faculty and staff groups identified several existing buildings for demolition based on factors that not only included their physical condition but the potential density they contributed to campus and whether or not the programmatic function they served was in the long term best interest of the campus in their present locations. The following buildings were recommended to be demolished over time and their users moved to new or renovated spaces:

- Academic Research Center
- Ag Sciences Storage
- Air Test Facility
- Animal Husbandry
- Animal Metabolism
- Animal Science Shop
- Baseball Stadium
- Breland Hall Addition
- Carte Barn/Animal Science
- Cole Village
- Cosmic Ray Lab
- Departmental Storage Buildings
- Education Services
- Facilities Services Complex
- Fire Station
- Flammable Storage
- Genesis Center
- Green Houses – Arrowhead Park
- Herder’s Residence
- Judging Barn
- Milton Hall
- Monagle Hall
- Neale Hall
- Observatories
- PGEL Group
- Poultry Science
- PSL Shops
- Rentfrow Gym
- Sheep Barn
- Small Animal Lab
- Softball Complex
- Sorority Houses
- Stucky Hall
- Tejada Building
- Theater Scene Shop
- University Police Station
- Wells Hall
- Wind Tunnel

The following buildings have been identified for demolition, with replacement facilities provided elsewhere on campus:

- Alumni Dorms
- Dairy Barn and Steel Storage Barn
- Greek Housing Complex and Addition
- Hardman Hall
- Hershel Zohn Theater
- Jacobs Hall
- Regent’s Row Dorm
- Swine Barn
- Tom Fort and Sutherland Village
- Williams Hall
Land Use Migration Plan
Illustrative Campus Master Plan
Plan Elements
The plan for the NMSU Las Cruces reflects an accommodation of the programmatic changes necessary to be in the top quartile of its peers and to accommodate a target student enrollment of 25,000 within 20 years. The plan achieves this and fulfills the following goals:

• Transform University Avenue into successful town/gown edge with mixed uses, calmed traffic flows and a safe environment for pedestrians;
• Assemble student services in a central location accessible from the major pedestrian pathways with nearby convenient visitor parking;
• Expand the current undergraduate housing zone to include graduate student housing along University Avenue;
• Develop a family housing zone that is proximate to the academic core with a rich sense of community;
• Establish pedestrian movement as the priority means of movement on campus providing pathways with shade, adequate lighting, opportunities for seating and informal gathering;
• Establish the University’s visibility along both interstates;
• Provide a vision for the Arrowhead Research Park that takes positions the University as an economic development partner in the region;
• Utilize the east campus for support uses to the University’s mission and as a land bank for the future;
• Establish a clearly identifiable hierarchy of entrances into campus that increase wayfinding and the University’s image in the community;
• Utilize the western end of campus as a heritage landscape accentuating the University’s agricultural past; and
• Develop a multi-modal access system that moves large parking areas to campus perimeters, encourages bicycle usage and expands the campus shuttle system.

During the planning process the city was presented with and approved a private sector mixed use development for the northwest corner of Espina Street and University Avenue that will place the buildings and public spaces on the street with associated parking in the back. NMSU and the city are also currently negotiating placing the proposed Las Cruces Convention Center (LCC) on the western end of the campus. In response NMSU is planning to locate its proposed hotel and conference center in proximity to the
LCC to facilitate joint uses and are exploring the potential for a shared management and scheduling agreement. The master plan also recognizes the University’s intention to locate the first three phases of NMSU’s proposed Arts Complex at the southeast corner of Espina Street and University Avenue with a fourth and sixth phase to be located on the southwest corner on the north side of Skeen Hall. All three of these proposed projects will address University Avenue with rich public spaces and significant architectural character that is complimentary to the campus. Parking for these facilities will be accommodated via surface lots in the near term but the third phase of the Arts Complex will need to include a multi-story parking facility to augment event, hotel and commuter parking needs.

NMSU is also committed that future infill development adjacent to University Avenue will have a public entrance that greets the community. Planned additions to Gardner Hall, the Business School and Health Social Services (HSS) will not only address the campus with a courtyard or quad space but also provide a public space on University Avenue. Many of the parking lots with entry drives from University Avenue will be removed but appropriate service access will be maintained. Pan Am Plaza is on land that is currently leased long term from NMSU. As a result of the master plan process the lease holder is exploring ways to bring mixed use development toward the street while maintaining parking in the center of the site. Existing uses are accommodated in the plan while creating a pedestrian friendly environment along the street. The University is also considering replacing the three sorority houses as new mixed use buildings are added. These buildings will also provide either goods or services at the first floor (street level) with graduate housing located on the upper floors.

One of the signatures of the plan is a new entrance for NMSU visitors at Jordan Street. The existing street will be replaced with a divided entrance flanked by mixed use buildings accommodating goods and/or services at the first floor with graduate housing apartments above. There will be a landscape verge adjacent to the curb allowing space for shade trees. The buildings are anticipated to create shade with either a colonnade or other mechanical means. Sidewalks will be wide enough to allow street vending or other special events. A cul-de-sac will prevent vehicular traffic from moving beyond access to the new parking deck providing visitor or other short term parking. A new north/south pedestrian mall will begin allowing access to a new central green space that will provide a hinge at the intersection of the academic district, student services and housing zones. This new space will replace the existing parking lots on the east side of Milton Hall creating a new central campus oval for student events and informal gathering. As new buildings come on-line and the existing
programs located in Milton are relocated elsewhere the plan recommends that Milton be removed and the central green be expanded to the west.

**Existing Housing District 2**

The existing housing district includes the area from University Avenue to Stewart Street and Educational Services to Milton Hall and includes residence halls, single student apartments, Corbet Center, Garcia Annex, Breland Hall and Educational Services building with Regent’s Lawn as the primary open space.

The plan anticipates the replacement of Monagle Hall with another residence hall complex and a second phase of new single student apartments on the Alumni Dorms site within the 10-year time horizon. The proposed Native American Cultural Center (NACC) will be located on the south side of the Regent’s Lawn between Corbet Center and Educational Services. Regents Lawn will be enhanced to include diagonally crossing paths and an expansion and improvement to the pond to provide a symbolic proximity to the NACC and a singular destination open space for students on the eastern end of the campus. The eastern end of International Mall will be narrowed to a more comfortable pedestrian scale with the addition of appropriately scaled lighting, ample seating, and shade trees on either side of the
path and down the middle. Parking lots 42 and 43 on the south side of Garcia Annex will be replaced with two new buildings developed as new space is required. Placement of these buildings will allow a pathway between the new campus central open space toward Stewart Street to receive pedestrians coming from the new family housing district.

**New Housing District 3**

The newest housing on campus, Vista Del Monte apartments, will remain in its current location and with the addition of a new community center as currently planned for the southeast corner of Wells and Williams Streets. However, many of the other uses in this district are to be relocated over time to make room for a new family housing district with an appropriate density to replace the existing family housing stock. The new neighborhood will provide a variety of housing options to meet market demand. Townhouses will face the streets with flats on the interior of the site. A street grid will be introduced for proximate parking to the units with shared green spaces on the interior of building clusters.

The need for this district will be dictated by need for the southward academic expansion into the area currently occupied by Tom Fort and Sutherland Villages. As this need arises the softball and baseball complexes will need to be relocated to the Athletics district at the eastern edge of the west campus adjacent to I-25 allowing new family housing to be located on the east side of Locust Street. An expansion of the student activities center is recommended on current site of Rentfrow Gym to meet the current need for more space. The new center should be sized to accommodate the high student population target of 25,000. The Facilities Services complex will need to be relocated to the east campus to allow for an expansion of the recreation fields to the south and the various other users south and east of Facilities Services will need to be relocated as needed to complete the housing area. Exact programmatic considerations for each of the uses to be relocated will need to be studied as the need arises.

**Academic District 4**

The academic district encompasses an area from University Avenue to Stewart Street and from Knox Street to Locust Street. The historic horseshoe is patterned after campuses in the eastern United States in that the open spaces are characterized by large shade trees and open lawns. Building placement creates strong edges to the historic horseshoe and numerous small courtyards. International Mall and Frenger Street Mall are the two primary east/west pedestrian paths.

The plan respects the structure of this district recommending limited demolition and integration of new buildings in select locations. Locating the Arts Complex (AC) on University Avenue will require the historic Nason House to be relocated to the east side of O’Loughlin House. The new location of the house should maintain its relative position to the street and the horseshoe to keep in its historic context. Renovation and a reassignment of uses should be considered. Additions to Gardner Hall, the Business School and HSS should focus on building placement that creates a public entrance from
University Avenue as well as a courtyard entrance from campus. The AC will also engage the Conroy Honors Center and the Music practice building. It is envisioned that these two buildings will become part of the Complex. The AC will share loading access from the existing service road on the north side of the Chemistry Building.

Hardman, Jacobs and the Zohn Theater are to be replaced by a new 3 to 4-story classroom/lab building. The new building will establish the western edge of the central space and its architecture is intended to create an arcade on the east side of the building. Both ends of the arcade are recommended to have a vertical element that will be mirrored on the corners of an open trellis structure on the western edge of the Corbet Center. The Corbet Center trellis could include flowering vines to provide shade or rely on canopy shade trees or a combination of both. The four vertical elements are intended to establish the edges of the space creating visual unity. Shaded plazas with seating should be placed with the tower elements meet the I Mall and Frenger Street Mall to reinforce the public realm. A new Student Services Building is recommended to be placed on the east side of the Speech and English Building to act as the northern gateway into the central oval. This building is intended to be built in two phases the second phase being built once Monagle Hall is removed.
It is recommended that the Breland Hall addition be demolished and that the historic portion of the building be renovated to bring it back to its original state. The plan also recommends that an addition to the Zuhl Library be added to the east of the current building to create the southern gateway to the hinge. Regent’s Row Dorm is currently used as a swing space but NMSU ultimately intends to demolish the building. Because of its proximity to the academic core and its relative position to the hinge this site should be reserved for a new academic building that will address the street and as well as receive pedestrians coming from the north.

The northern terminus of Williams Street at the Food Court currently serves as a stop for the campus shuttle. This terminus should be configured as a cul-de-sac to prevent traffic from entering the Frenger Street Mall. Loading areas should be maintained but should be screened appropriately with landscaping or site walls.

Preciado Park should be maintained as a public open space. Renovations and expansions of O’Donnell Hall and the new academic building to be located on the existing parking lot should not encroach on the park environs. The addition of diagonally oriented paths should be carefully placed to avoid the removal of existing trees.

Several buildings on the west side of Espina Street between Frenger Street and Gregg Street are to be removed. Many of these buildings are remnants of an earlier time when expedited development took precedence over strategic planning. Based on interviews with leadership from the Department of Animal Science it was determined that most of these buildings could either be removed and their uses relocated to an off campus property or be consolidated into a more compact campus area. New academic expansion into this area is intended to be multi-disciplinary in nature and be configured in a manner that places the buildings on the street creating a pedestrian realm internally. The existing parking lots shared by Gerald Thomas and Knox Halls will be converted into a quad space that extends south to Stewart Street creating a pedestrian linkage between the new livestock arena planned for the area currently occupied by the cattle and horse corrals. Frenger Street Mall is intended to extend to the west to the large commuter parking lot to be located west of Knox Street. The current food science lab and retail outlet is intended to be combined with other programs currently housed in various one-story buildings into a 3-story building on the southwest corner of Espina Street and Frenger Street. It is envisioned that the retail store associated with the food lab will be located on a plaza on Frenger Street Mall to take advantage of the daily foot traffic from the parking lots, various school groups and other visitors to campus.
Academic / Research District 5
Driven by goal of developing a interdisciplinary research, the plan recognizes research clusters rather than college and departments. The academic / research district reflects a major change in the organization of campus requiring the relocation of family housing to the interior allowing new interdisciplinary research buildings to claim the I-10 frontage. Encompassing the area south of Stewart Street and west of the recreation fields the area is intended to accommodate the research growth necessary for NMSU to rise to the top quartile of its peers and then to keep pace with them over time. Building configurations are intended to create a strong street edge while providing internally focused diagonally oriented pedestrian path system. Service areas should be internally configured so as not to conflict with pedestrian paths.

The proposed Livestock Arena is located on the northwest corner of Sam Steel Way and Knox Street. This location takes advantage of proximity to the existing equestrian facilities and provides visibility from the interstate that will help attract corporate sponsorships of the facility. Many of the animal research currently scattered to the north should be consolidated and located in proximity to the Arena. Specific uses identified for relocation are the Metabolism and Surgery Center, Feed Barn and Processing facility and associated animal pens. The internally configured pedestrian linkage begun at Gerald Thomas and Knox Halls should be extended south and linked to the Arena area to simplify movement between researchers and their subject animals.

Arrowhead Research Park District 6
The Arrowhead Research Park is the introduction to the NMSU campus for northbound I-10 traffic. With an employment target of 1,500-2,000 employees within the next five years the park's focus is the University's strategic clusters in aerospace, industry, sponsored programs in nanotechnology and material science and homeland security.

The plan envisions the park to include approximately 40 parcels and 3 million square feet of office and research space. Recent recruiting efforts have been directed toward the weather forecasting company and manufacturing facility. Immediate needs include a 40,000 square foot facility half of which would service as Arrowhead's central office to include conference space, a central meeting space, executive offices, classroom space for students and professors who are employed by companies in the park. The remaining 20,000 square foot would be for leasing for up to 10 companies. Other opportunities have been discussed that would be complimentary to the research mission of the park including a charter school and a lab school. The greenhouses currently occupying land within the park should be removed within the 20 year time horizon to allow expansion of uses that are aligned with NMSU's regional economic development goals.

The plan recognizes a joint initiative between the New
Mexico and Texas Departments of Transportation to improve the interstate corridor between El Paso and Las Cruces and a current proposal to improve the 10/25 interchange. In exchange for the land needed by NMDOT for the interchange NMSU is working to obtain a new on and off ramp at the Park entrance road. With this new access point Arrowhead will become more accessible and should help to stimulate its growth. The new access point will also allow the University to extend the current park entrance road up to Wells Street creating a third interstate access into the campus. This new road is envisioned as a 4-lane divided boulevard will alleviated traffic on University Avenue and may become a preferred means of ingress and egress for commuters and sports and special event traffic.

The Park should adopt a set of architectural and site development guidelines to maintain a consistent standard for buildings within the park. Key sites should be identified and preserved for special uses with special attention being given to the southernmost site. With the improved interchange this site will become the premier opportunity for visibility and marketing NMSU. Everyone traveling north on I – 25 or west on I – 10 will see the building that will occupy this site so the University needs to choose carefully what type of building is constructed there.

**Athletic District 7**

The plan recommends consolidating all athletic venues with the exception of the equestrian program in the area to the west of the football practice fields to include the tennis center and football stadium. New pedestrian plazas are shown on the northern and southern ends of the football stadium to create special event areas for pre- and post-game activities. Site for new athletic facilities are preserved on both sides of these plazas to accommodate future program needs. A new parking lot is planned on the site of the old landfill site with additional parking located to the south and east for use by both commuter students and sports fans. A new baseball stadium is envisioned at the southeast corner of Wells and Payne Streets. The potential exists that the City of Las Cruces may have the opportunity to attract a professional or semi-professional baseball team. In this eventuality the University could build a higher quality stadium for shared use by the...
West Campus District 8

West Campus District

Potential View of University Avenue Development

Potential View of Performing Arts Complex

It is anticipated that Payne Street will become a tree-lined avenue with wide sidewalks leading from parking lots of athletic venues. Internal pathways should facilitate pedestrian movement within and between venues. Care should be taken to provide shade and seating along pathways with special attention given to venue entry plazas and support spaces.

West Campus District 8

The western end of campus, the area west of Union Street, is within the 100-year floodplain and is predominantly used for the cultivation of feed for animals being kept by the Department of Animal Sciences. College Avenue enters campus east of the University Avenue / Interstate 10 interchange aligning with the historic entry road to campus and providing access to the USDA Cotton Gin facility and to the entomology labs.

The plan recommends that this district continue to reflect the University's agricultural heritage with clean fence lines along the street edges reflecting a well-maintained agrarian image. The Las Cruces Center and NMSU's hotel/conference center as described in District 1 should reflect the regional

professional and college teams. A new soccer stadium and soccer practice field is to be located at the southeast corner of Payne and Stewart Streets.
influences that shaped the campus celebrating the links to its agricultural past.

The plan proposes a new entrance sequence for College Avenue at that brings traffic exiting I-10 to the historic horseshoe. The new road would be a divided, landscaped boulevard aligning with existing College Drive preserving the adobe structure currently used as a nematology lab maintaining access to the cotton gin and labs via the existing road alignment. One of the best views of campus can be experienced approaching from the west with the Organ Mountains in the background. Because El Paseo Drive is a direct linkage to downtown (becoming Union Street south of University Avenue) open fields on the east side of the road should be preserved creating a buffer to preserve these views.

**East Campus District 9**

The east campus is predominantly desert mesa that is used for passive recreation. Specific uses include the president’s home, University golf course and club house, rodeo facility and discarded equipment yard. The land includes an Elephant Butte Irrigation District dam on the east side of the golf course, New Mexico’s farm and ranch museum located north of Dripping Springs Road and A Mountain at the eastern edge of the property. A future phase of Sonoma Ranch Boulevard is proposed to extend along the eastern property line with connection to Geothermal Drive. When this connection is established it will provide an eastern entrance into the campus making development on the east campus more likely.

The plan recommends that a new president’s home be located at the northeast corner of the Las Alturas neighborhood allowing the residence to become part of a local neighborhood while maintaining it on campus-owned land and a separate access from Geothermal Drive. Because of the adjacency requirements between the two the alumni center and president’s home should be considered in concert. The new alumni center should be proximate to allow the president easy access for special events and make servicing the two facilities more flexible. The area south is reserved for special purpose housing to include residents to be used as incentives for recruiting faculty and home for staff with an area potentially set aside for a future retirement community.

It is anticipated that a services complex would be located at the intersection of Geothermal and Sonoma Ranch allowing convenient access to campus and the future academic research zone. Land southeast of the golf course is being reserved for a future outreach opportunity possibly to include an additional 18-hole links golf course. It is anticipated that when Arrowhead Park is built out additional land will be needed for expansion of its mission. The area east of the golf course and dam north of Dripping Springs Road has been reserved this eventuality.

Tortugas Mountain holds special cultural significance and is the focus of a yearly pilgrimage that at Sterns Road on the west side of I - 10, progresses through the campus up the Tortugas Arroyo, follows Geothermal Drive to the mountain. The plan recognizes the importance of this festival and local effort to set aside the mountain as a park.

Although all potential uses can not be anticipated at this juncture, the University needs to reserve the balance as a land bank for future development.
Alamogordo Campus Master Plan
NMSU Alamogordo

The current campus occupies a hillside site and is organized roughly northwest to southeast along pedestrian path linking the various buildings. Infill development is recommended that will require the relocation of parking to the northern and southern perimeters and across Scenic Drive to open land adjacent to the Tays Center. The plan recognizes several initiatives that will enhance the Alamogordo campus:

1. A one-story 3,500 square foot academic support building is proposed on the lawn area east of the administration building;
2. A classroom building to be located on the south side of the faculty office building;
3. A two to three-story 15,000 square foot allied health sciences center to be located on the northwest side of the library;
4. A multi-purpose center to be located on the ridge on the east side of the nursing/tech education center to include a CEO’s residence, conference center, large reception area and 1 – 2 guest apartments for Fulbright scholars and visiting faculty;
5. A student services center addition to include expansion of the bookstore;
6. A student center addition to include a restaurant;
7. An advanced technology center for vocational education to be located on the Tays Center site across Scenic Drive; and
8. An addition to the Tays Center to expand its recreation function.

The land north of the Tays Center currently dedicated as a walking trail is set aside as a land bank for future expansion.

NMSU Carlsbad

The Carlsbad campus occupies a hillside site and is organized north to south with a covered pedestrian walk and adjoining...
courtyards linking the three existing buildings. The plan proposes that new development continue to be organized along this spine and that the courtyards between buildings will be enhanced with more seating and informal gathering space. A new 15,000 square foot classroom facility (1) is recommended to be located on the east side of the existing computer center to address current program needs. The existing drop-off (2) and area between the buildings should provide a shaded student spaces with ample seating. Future campus expansion should be directed on the north side of the instructional center (3) with the open parcel at the front of the campus is held in reserve (4). The up-slope of the mesa and the area south up to the Monitoring Research Center (5) are dedicated as land banks (6).

NMSU Dona Ana Community College
The plan recognizes that small changes to the central campus
Parking is the main challenge at the central campus due to its perimeter location along the southwestern perimeter of NMSU Las Cruces and the rapid growth it has seen within the last several years. The plan recognizes an expansion and improvement of the gravel parking lot designated as Lot 68, the potential to use parking associated with the proposed livestock arena and the availability of expanded parking facilities north of Stewart Street. Due to these improved conditions the plan proposes that a portion of parking lot be reconfigured into a campus lawn that will modify the way students arrive and perceive the campus. Currently students migrate to the internal courtyards shared by the buildings. This proposed modification would allow the front door of campus to accommodate outdoor events and encourage a wider interaction between students.

The East Mesa campus master plan anticipates the continuing growth of the Dona Ana Community College program and accommodates current and future needs. The campus plan as developed by the Williams Design Group and SMPC Architects is provided here.
NMSU Grants

The plan for the Grants campus reflects the desire to create a park-like, pedestrian-focused environment with shade and outdoor seating linking buildings together and providing a structure for building architecture that reflects the regions cultural heritage. The landscape should be rich with desert flora should be a lab to teach about solar, water conservation and wind while celebrating local art.

Moving the parking to the perimeter is the first step to implementing the plan. While this can be easily accomplished to the south using vacant land, the lot on the north side will require the relocation of the existing track. A new drop-off is proposed at the western edge of the campus with drivers being given the choice between parking to the north or south. Pedestrian paths will lead from the parking lots into an interior open space. Lawn in this space is reflective of the desire to have an area for informal student gathering or special events so it will have to be irrigated to be maintained. A formal plaza is desired in front Martinez Memorial Hall, the administration-classroom building. The lava rock walls at the perimeter of the existing lawn courtyards on the west side of Martinez Hall will be removed allowing pedestrian use to be more flexible.

Current program goals are to provide an expanded trades area where trades that generate smells can be segregated to prevent odors from leaking into Martinez Hall. A new instructional building incorporating the child development center could potentially be located between Martinez and the McClure Educational Center. A new library is desired that can be a focal point on campus. Other proposed buildings should incorporate multiple programs including a wellness center, adult education center, astronomy center and outdoor amphitheater for traditional festivals and speakers.
Campus Landscape
The goal of the master plan is to maintain the manicured landscape character of the Horseshoe Lawn, Regents Lawn and the proposed campus hinge space that are dedicated as gathering places for the University, while encouraging the use of a more sustainable landscape approach for the majority of the campus and other open spaces. This concept works well within the regional context of the University – a green river valley surrounded by desert mesa. The intent is to maintain and reinforce the unique qualities of these two types of landscape and to avoid hybridizing them into landscapes of little distinction. The courtyards, greens and athletic fields thus become pedestrian oriented oasis’s within the overall campus landscape.

The University region comprises three distinct landscape zones with different levels of irrigation and maintenance needs. The major zones are the valley landscape, transition landscape and the desert mesa.

Valley Landscape
The heart of the campus is the valley landscape where plantings are more manicured, green and park-like with a variety of ornamental species. The use of distinct “valley” vegetation is encouraged in large open spaces such as Cottonwoods, Sycamores, Ash and Desert Willows. Use of low maintenance and drought tolerant ground covers and ornamental grasses are encouraged. A higher level of irrigation and maintenance should be allocated to this zone making more detail plants possible.

Transition Zone
Surrounding the valley zone is the transition zone that serves as a buffer between the lush campus core and the desert mesas. In this zone low maintenance and water are important in plant selection. Planting should be rich and diverse at building entries and courtyards and other gathering areas, but must utilize species that require minimal long-term maintenance. Plants should also reflect the character and style of the southwest environment by using dry climate trees shrubs and groundcovers and desert accents and as opposed to temperate plants. The transition zone is intended to convey a sense of place that the university is located in the Southwest.

Desert Mesa
The desert mesa zone is primarily the far eastern area of the campus property that abuts the Organ Mountains. It should remain natural in character and any development in this zone should use primarily native or adapted plants and introduce more rocks, and boulders and gravel mulch. Rocks, boulders and gravel used should be the same color and texture of the natural landscape and should be compatible with the local geology. Plan palette should be entirely desert derived with the use of desert accents, ground covers and rock mulches.

Edge And Identity
Developing a more identifiable edge for the campus will assist in creating a stronger sense of place and identity for the campus. Due to the variety of adjacent land uses and the relationship to campus facilities each edge must be defined to not only enhance the identity of the campus, but to respond to the unique characteristics of the surrounding environment.

The campus edge landscape addresses each of these areas with specific planting programs which, taken together, create a consistent edge treatment that enhances the identity of the University, provide views into the campus, and screens unwanted views with landscape.

In addition to establishing a more identifiable edge, it is equally important to establish a set of identifiable arrival images or icons for the campus. Architectural features, walls, and strong imaginable accent planting and signage should be used as icons at the key intersections. Priority attention should be given to University Avenue, a City of Las Cruces owned and maintained arterial roadway that serves as the front door to the campus.

To reinforce the campus identity along University Avenue and reinforce a new urban edge, a landscape parkway will be created to allow tree planting and the planting shall be extended along the entire frontage and include the opposite side of the street. The campus edge will be defined primarily by the double row of canopy trees creating a pedestrian promenade. This will reinforce University Avenue as a rich pedestrian environment bridging the community and the campus. A median will be added with smaller flowering trees.
to help calm traffic and further enhance the street scene. Consistent with the more sustainable and natural landscape character proposed for the campus edges, the ground plane planting will consist primarily of drought tolerant plant material.

Along University Avenue, where pedestrians and automobile traffic must coexist, care should be taken to create distinctly marked crossings for pedestrians. To enhance pedestrian circulation, special pavement is proposed at key pedestrian crossings.

Campus lighting with opportunities for “campus-oriented” banners should be introduced along University Avenue.

Interstate 10 and Interstate 25
To enhance the NMSU identity and provide a consistent theme along each freeway edge, a signature Pecan grove planting is proposed along both Interstates in the Valley Zone from Wells Street to University Avenue. This will create a strong visual edge for the campus while also reinforcing the historical agricultural roots of the campus. In the transition zone a formal consistent edge of drought tolerant desert willow should also be implemented over time as these areas of campus develop. In the interim, markers could be established at regular intervals to signify the campus boundaries. At the intersection of Interstate 10 and 25 signage or a University icon should be established.

Campus Entry Drives - College, Union, Wells, Stewart, Williams, Jordan
To reinforce the campus entry and identity, the successful and strong signature planting of Pecan trees is proposed to continue along all major campus entry drives. These campus entries provide opportunities for campus identity marking, which will help the University to achieve greater visibility in the community and provide clear signals that tell visitors where to enter the campus.

As a highly visible identity feature, the formal double row of Pecan trees will be planted to create a campus entry “icon”. The Pecan tree is perhaps the most noteworthy “signature” tree on the campus, currently used to announce campus arrival at several important west campus entry drives and should be continued along the east as well. At the new Jordan Street Entry off of University Drive a formal planting of canopy trees in an urban setting is proposed.

Pedestrian Circulation
The major landscape corridor within the existing academic district, the International Mall is the symbolic link between major student and academic facilities. The landscape for the Mall proposes a formal planting of singular species of canopy trees linking the three major green spaces of the central campus, Horseshoe Lawn, new Campus Green and the reconfigured Regents Lawn and Duck Pond. The International Mall is overly wide to accommodate high pedestrian activity, maintaining views to A Mountain are important.

To respond to the campus growth to the south, the Master Plan proposes the creation of a major north/south Mall replacing Breland Drive. This could be developed with a central spine providing separation between bikes and pedestrians. In addition two minor promenades are proposed that will promenades will link the campus core to residential and research areas. Together with the International Mall, these north/south spines allows for efficient pedestrian circulation through the campus. The landscape for these pedestrian malls should be well defined with formal canopy tree spacing.

The wider promenades are scaled to accommodate groups of students traveling between classes, as well as fire trucks and service vehicles. Malls should be treated with a consistent quality of landscape, hardscape, signage and lighting. Planting should be formally spaced clearly defining the pedestrian space. Pedestrian scale lighting, and formal plantings of canopy and flowering trees reinforce the hierarchy of the promenades within the pedestrian network, orienting pedestrians to the circulation network. Openings in the promenade planting shall be permitted at building edges and entries. Specific tree species are identified for each mall to create a unique character and identity for each corridor.

Academic and social interaction should be encouraged with the provision of formal and informal seating areas. Seating areas, with ample shade and lighting should be located at key intersections and primary entries to buildings.

To further enhance the pedestrian experience, it is encouraged that thematic concepts be developed for key...
promenades. The Campus Master Plan identifies a number of existing and new campus corridors. Distinct canopy trees that visually and spatially define circulation routes and give each corridor a distinct identity mark major campus corridors.

In general the pedestrian malls are proposed with formal rows of canopy trees and the street corridors maintain the informal park like character except at campus entries.

Secondary walks are more informal in character, are based on a loose “network” of narrower walks and paths, frequently diverging from the campus grid to reinforce diagonal desire lines. Malls are distinguished from the less formal “secondary” network by a distinctive formal planting of canopy and flowering trees and a wider width (15 to 20’), while the secondary walks are designed only as wide as necessary to accommodate passing students, generally six to ten feet wide.

Pedestrian walks shall be designed to be ADA accessible. The unavoidable length of ramps should be acknowledged and incorporated into site design, with stairs provided at the sides as complimentary elements. Walks providing universal access, with a maximum slope of 1:20 are preferred over ramps or stairs.

Campus Greens
Buildings on the campus will be grouped around several major open spaces - Horseshoe Lawn, new Campus Green, and Regents Grove. The Horseshoe Lawn should remain the historical heart of the campus offering an open flexible space for informal activities and public gatherings. The large informal canopy tree planting should remain. New trees should be strategically placed to enhance and define the space.

New Campus Oval - ‘The Hinge’
This would become the living room of the campus offering a large space for public gatherings. Additions of formal patterns at the edges defining building courtyards will provide small spaces for standard gatherings. The area will be largely lawn framed by a formal trellis structure. Planting should be simple and bold. Maintain the large groves of Sycamores currently planted and supplement the grove with new Sycamore trees.

Regents Grove and Duck Pond should be improved to maintain a park like setting with a diverse plant palette. This park could function as a small arboretum within the campus with opportunities for education and plant identification. An arboretum enriches academic programs, attracts visitors, and is an asset for public relations. A campus arboretum is a significant regional asset that could become a teaching tool in grades K through 12. An additional water feature is added as a forecourt to the Native American Center. Regents Grove is relocated to a prominent hill near the Duck Pond. This is a unique area on campus which should be enhanced with seating, picnic areas and diverse under story planting. Permanent stone plaques for the Regents Grove should be added.

Courtyards
Courtyards and quads should be developed to provide for a diversity of uses including interactive gathering areas such as dining terraces, outdoor classrooms and small amphitheaters, passive/informal play areas, and quiet personal spaces such as reading gardens. Courtyard designs should reflect individuality and difference in expression. The proposed character of an open space should relate to their immediate surroundings and reflect the proposed uses for the adjacent building. They should possess adequate edge definition in order to avoid a sense of unplanned relationship with their surroundings and to enhance the experience of being within them. Courtyards associated with buildings have a strong edge definition, while open spaces between buildings will require additional elements such as walls or planting to create their edges.

Open spaces can be “activated” through the selective location of program elements such as cafes, lounges and entries. Small gathering areas should be provided at key building entries and key pedestrian intersections to encourage increased social interaction between students, faculty and staff.

The landscape of courtyards and quads should respond to the Las Cruces climate of hot summers and mild winters. Planting of deciduous trees providing for shade in the summer and sunny light spaces that take advantage of mild winter days are desirable. Selected and limited use of water in key gathering areas can provide a cool retreat or oasis in hot summer months. Low shrubs and groundcovers should be planted adjacent to buildings to soften the edges of the structures.

In contrast to the lush, irrigated “valley” nature of the campus greens, the campus edges and informal open spaces
shall be characterized with a more “picturesque” desert landscape reminiscent of the natural landscape of southern New Mexico. While the climate of Las Cruces allows a great variety of evergreen trees to grow here, the intent is to provide a more “sustainable” landscape of long-lived, low maintenance, drought tolerant plants for the campus that also reinforces the overall University identity. Use of more native and naturalized trees, such as Desert Willow, Mesquite, Oaks, Sycamores and Pines should be the primary “background” trees with select plantings of primarily native accent and flowering plants and shrubs. The ground cover can consist of “natural” grasses, establishing a “signature” landscape for the campus. Select use of native accent ground covers and shrubs may be utilized. The use of turf grass should be limited to areas of functional and symbolic needs.

Campus Roads And Parking
The NMSU Campus is served by a number of existing road corridors. Distinct canopy trees that visually and spatially define circulation routes can give each roadway a distinct identity mark major campus corridors. In general the pedestrian malls are proposed with formal rows of canopy trees and the street corridors maintain the informal park like character except at campus entries. As building develops the campus roads should be transformed into attractive pedestrian scaled corridors that minimize conflict with vehicles. Several ideas have been proposed to accomplish this.

Espina Street is wide enough to add a median and widened Parkway with a formal planter of canopy trees. Stewart Street could be narrowed with a median in the center to create pedestrian refuge and provide traffic calming.

Payne Street functions as a “civic” road and will become a major connection to the Research Park and should be formal in character with equally spaced canopy trees.

Wells Street should maintain the existing boulevard character with a simplified plant palette; existing palms give the street a distinct and imaginable identity and should be increased.

Parking Lots
Parking lots should be landscaped to adequately screen undesirable views, provide visual relief from large expanses of paving, and reduce excessive solar gain. Drought tolerant, natural planting styles are best suited for parking areas. As feasible, “bio-swales” which handle the first flush of storm run-off and discharge should be incorporated in the design of parking areas.

Hardscape, Site Lighting and Site Furnishings
Hardscape, landscape and site lighting play an important role in establishing a safer and more secure environment for students, staff, faculty and visitors. These materials should be utilized in ways that promote actual as well as perceived safety of campus areas, including parking structures and surface lots, pedestrian pathways, campus open spaces and building entries.

Lighting is a key component of the campus landscape that contributes to campus identity, safety and ambiance. Lighting should provide illumination for campus entries, parking areas and pedestrian corridors. Outdoor lighting should be designed to minimize light spilling onto adjacent, non-University property, to enhance natural color rendition, and to provide the required illumination for safety. Lighting in open areas should create balanced illumination such that both perception and actuality of safety is assured.

The use of consistent site furnishings, lighting and signage will help to unify the campus as a whole and enhance architectural and open space character. Site furnishings consist of bicycle racks, loose and fixed seating, tables, benches and trash receptacles. Bicycle racks should be located along pedestrian promenades and pathways at key building entries, preferably to the side of buildings. Care should be taken to ensure that these racks do not impede entry to the building or create a visual blight at the building entrance.

Fixed seating includes benches and seating of comfortable height incorporated into planters, low dividing walls, and/or incorporated into the façade of buildings. Appropriate site furnishings support pedestrian activity throughout the campus open space and should be designed, chosen and located to reinforce the programmed uses of the open space area: eating, assembly for outdoor classrooms, solitary relaxation or study, and social interaction.
Sustainability
Sustainability generally means minimizing the impact of human activity on the natural environment by preserving natural resources such as the conservation of energy and water. Long term cost and maintenance issues should be considered. These considerations have been built into the Landscape Plan and can be implemented in a phased manner as each new building, open space and pedestrian component is developed. There are a number of practices that can be implemented which will promote a sustainable landscape.

Plant Selection
The primary planting strategy proposed throughout the campus is to concentrate more maintenance intensive landscapes in selected greens and quads while encouraging a more sustainable, native and drought tolerant landscape outside of these core areas. Plants in general should be chosen that minimize the need for chemicals, fertilizer and pruning. Where shrubs are used, species that require ongoing pruning and care to maintain their form should be avoided. Design should be based in the structure of native plant communities and consider site specific elements such as soils and hydrology. Plants with similar water needs should be grouped together. Plants should also provide habitat for wildlife.

Water Conservation
The City of Las Cruces receives less than nine inches of rain a year. Because it is situated over a natural underground aquifer, it does not suffer the water problems of a number of southwestern cities. However, water conservation measures should be incorporated into the campus that will aid in maintaining the sustainability of water supplies for future generations, improve and protect surface and ground water quality and preserve the Hueco and Mesilla ground water basins. Like many desert cities Las Cruces has a monsoon season, when heavy thunderstorms can occur daily in July and August creating water management issues. These issues need to be incorporated into a comprehensive storm water management system. There are several ways to manage and conserve water that can easily be incorporated into the landscape for the University.

Storm water should be captured wherever possible to replenish ground water. Existing Arroyos and washes should be improved to capture and store runoff. Design should encourage water retention and filtration through means such as planting for bio filtration and creating check dams and small basins to help water percolate slowly into the soil. Surface vegetated swales that drain into the existing Arroyos and washes should be implemented in new campus developments. Infiltration trenches are long thin channels filled with course aggregate that can be located adjacent to pavement areas. This can be especially effective in parking lots.

A large storage basin is located on the southwest area of the campus. This should be designed as a feature and amenity for the University and Research Park. It could provide habitat value and be an important educational tool involving the University students and the community. The University should also consider planning smaller basins located along the wash starting in the undeveloped eastern campus area to create a comprehensive storm water detention system.

Irrigation uses a substantial amount of water on campus. Using native and drought tolerant plant material can minimize irrigation use. In addition using recycled or reclaimed water can provide substantial energy and cost savings. Water efficient irrigation systems and management can make a dramatic difference in water use. Drip irrigation applies water slowly, directly to the soil. Drip irrigation has two important elements. First, it allows water to soak into the soil before it can evaporate or run off. The second is that the water is only applied where it is needed, at the plant’s roots rather than sprayed everywhere. For this reason drip irrigation is a preferred method of irrigation in the desert regions of the United States.

Energy Conservation
Proper location of trees shrubs and ground cover can reduce heat gains in the summer and prevent heat loss in the winter. Especially important with the large number of surface parking lots will be to increase the number of shade trees to reduce the amount of hard reflective pavement to reduce heat gain. In addition tree shaded pedestrian malls and paths will encourage walking and bike riding versus driving around campus.

Material Selections
The cost of installation and the efficiency of on-going maintenance and care for the pavement, planting and site furniture are critical ingredients in the creation of a successful campus landscape. Local native species should be incorporated into the landscape. Materials should be
appropriate to the region and long lasting. Use decomposed granite or light colored surfaces instead of concrete in plazas and courtyards.

For the bulk of the pedestrian network, natural gray concrete with simple broom finishes are proposed. The use of this material allows simple repairs and patches, reducing the contrast between new and old concrete, and allowing contiguous projects, which frequently occur over an extended period to have a consistent look and feel. Integral color and special pavement should only be used in special accent areas, such as building entries and courtyards.

**Maintenance**

While selection of appropriate plant materials and proper planting and water management techniques are important steps in developing a sustainable landscape, it is equally important that adequate management programs are in place to preserve these assets. Environmentally responsible nutrient management should be employed to maintain plant health and reduce susceptibility to pests, disease and environmental stress. The use of chemical herbicides, pesticides and fertilizers should be reduced or eliminated. Disease should be controlled through an integrated and environmentally responsible pest management program. All trimmings should be processed into mulch and used to control weeds, control erosion, retain soil moisture and provide nutrients.

**Implementation**

Landscape improvements are essential components of the overall Campus Master Plan. The intent of the Plan is to enable future building development while simultaneously creating a system of open space and landscape improvements. A key to this is the traditional funding mechanisms for building construction that often only allow for limited site and landscape improvements. Currently the private grounds company Sedexo, funds selected improvement projects identified by the University each year to a cost of $100,000, which is ideal for small focused improvements. Other landscape improvements become part of capital projects associated with buildings.

Implementation of key elements of the Plan will require a significant level of funding beyond that typically allocated for building construction. To ensure development of these elements, specific strategies should be set up. To the extent possible, landscape improvements, can be associated with adjacent building programs. In addition, a separate fund-raising program should be considered to support the construction of improvements whose funding cannot logically be associated with a specific building project. Another method is to identify landscape projects that can be designed and constructed as free-standing capital works. The benefits of such an approach are many, including:

- Consistency in the landscape treatment for any given sub-areas of campus.
• Comprehensive design approach to important spaces (e.g. International Mall, University Avenue, Jordan Street Entrance, the New Campus Green, and the Regents Lawn), not fragments of those spaces or elements within them.
• Allows for meaningful visual changes and improvements that will have immediate effect.
• Provides for the important, incremental implementation of the Landscape Plan independent of architectural developments.

The following areas have been selected as the initial site projects that can be approached as development projects for the University or as possible donor opportunities. These areas have been selected due to their prominence on campus, recognizable and definable outdoor spaces, diversity in the type of space they represent (i.e. street, community edge, campus green).

Key Improvement Projects Not Associated with Buildings:
1. University Avenue
2. New Campus green and Jordan Entry
3. International Mall
4. New North/South Mall

Improvement Projects for Sedexo
1. Entries
2. Establish seating areas
3. Freeway edges
4. Specific courtyards
5. Screening utilities.

Backbone / Identity - Proposed Trees

International Mall
- Fraxinus velutina ‘Modesto’ - Modesto Ash
- Fraxinus oxycarpa ‘Raywood’ - Raywood Ash

Secondary Pedestrian Malls
- Pistacia chinensis - Chinese Pistache
- Quercus Species - Oak
- Elaeagnus angustifolia - Russian Olive

University Avenue
- Quercus virginiana - Southern Live Oak
- Chilopsis unearis - (Median)

Entry Drives
- Carya illiniosiensis - Pecan

Freeway Edge
- Carya illiniosiensis - Pecan

Espina Street
- Koelreteria paniculata - Golden Rain Tree

Stewart Street
- Platanus acerfolia - London Plane Tree

Locust Street
- Ulmus americana - American Elm

Payne Street
- Pinus eldarica

Arcades Used to Define Hinge Space

Courtyards Should Reflect Their Surroundings

Low Water Use Landscapes
Figure P1
Transportation and Access

The projected growth of the university’s population and the Master Plan’s recommendations for infill growth on many of the existing parking lots in the campus interior will fundamentally shift the nature of the parking supply and demand. Assuming the university continues with its current model of providing ample, low-cost parking to satisfy demand, approximately 6,100 more parking spaces would be needed in 2025, as Table P5 shows.

Approximately 4,200 spaces would be displaced by the recommended planning strategy to move parking to the periphery of campus and infill buildings in the interior of campus. Figure P1 illustrates the various parking lots that would be displaced by full build-out of the plan by 2025.

The plan recommends the creation of fourteen new parking facilities, including two parking garages, which would add approximately 11,220 spaces to the parking inventory. Figure P2, below, depicts the locations of the new parking supply.

As Table P6 illustrates, almost 700 spaces would be created by paving and striping the currently unpaved portion of Lot 30, while 1,900 spaces would be added by expanding Lots 3. 5,350 spaces have been added in eight new lots (Lots A-H) south of Stewart Street with 515 spaces being added at

<table>
<thead>
<tr>
<th>Lot</th>
<th>Additional Spaces</th>
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<tr>
<td>A</td>
<td>2,082</td>
</tr>
<tr>
<td>B</td>
<td>720</td>
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<td>C</td>
<td>1,101</td>
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<td>D</td>
<td>144</td>
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<td>E</td>
<td>806</td>
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<td>F</td>
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<td>G</td>
<td>82</td>
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<tr>
<td>H</td>
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<td>I</td>
<td>515</td>
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<tr>
<td>J</td>
<td>435</td>
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<tr>
<td>K</td>
<td>388</td>
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<td>L</td>
<td>871</td>
</tr>
<tr>
<td>68 Addition</td>
<td>40</td>
</tr>
<tr>
<td>3 Addition</td>
<td>96</td>
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<tr>
<td>103 Addition</td>
<td>1,809</td>
</tr>
<tr>
<td>Garage</td>
<td>1,000</td>
</tr>
<tr>
<td>Repave Lot 30</td>
<td>713</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,223</strong></td>
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</table>

[1] Assumes garage size is 500 spaces
Figure P2
share of each population that is on campus simultaneously at the peak time. When multiplied together with the population numbers, these three factors indicate 2025 parking demand of approximately 21,286 spaces, an increase of 7,600 over the current parking demand.

Effects Of Continuing To Meet Parking Demand

The primary effects of continuing to meet parking demand, as opposed to reducing it through various means, are the following:

• Traffic congestion would increase both on campus and on roadways leading to campus. The kinds of delays experienced on University Avenue at peak times would increase, and many roadways on campus would experience similar delays.

• Many acres of land, probably in excess of 200, would be necessary to locate the future parking supply if it were in surface parking lots. This land is needed for academic and research buildings, student activity areas, and other facility goals of the university.

• If the parking spaces were located in parking garages, the cost would be between $30 and $40 million dollars, in 2006 dollars. Since the Parking Office is required to be self-sufficient, the cost per permit would be extremely high to cover the debt service and operating costs of a large number of garages.

  The quality of the campus experience would be somewhat degraded, as vehicles and pedestrians would conflict in many locations, air quality would suffer, and green space would have to be reduced to provide enough land for parking.

The University cannot afford to devote such a significant amount of land to parking uses, compared to using this land for academic purposes. Parking rates today are low, and it is unlikely that members of the campus community will be willing to pay many multiples of today’s rates for garage parking in the future. It is also unlikely that, given the financial needs of any major university system, that funding will come from the State of New Mexico for new parking garages.

Therefore, the University and the various members of the campus community need to begin planning and implementing activities to reduce the number of vehicles coming to the campus, particularly as it begins to grow in population and to make the physical changes foreseen in the Master Plan.

Ongoing And Increased Need For A Transportation System

As the campus population grows, the need to use the more peripheral parking lots will increase. This need may also be augmented by more individuals who want to park in free lots, due to fuel increases or other financial reasons.

In order to make the peripheral lots attractive, and to increase their use and diminish the extent of illegal parking in the heart of campus, it will be necessary to provide reliable and timely transportation from the lots to various locations on campus. Even though a major tenet of the Master Plan is to avoid extending the walk between classes from east to west, there will still be a need to support the large surface parking lots on the edges of campus with a transportation system.

The need for the Aggie Shuttle will doubtless remain, although its routes may change over time. Whether a campus circulator, such as the Aggie Shuttle, can be combined with a point-to-point service, such as that serving peripheral parking lots, is a question that will soon need to be resolved.

Recommendations

1. Parking and Transportation Management

Organizational Structure

The University should consider the development of a Parking and Transportation Services Department that will be responsible for the following major functions in the future:

• management and operations of all parking facilities associated with NMSU;
• enforcement of parking regulations, and the use of enforcement officers as ambassadors to help visitors and members of the campus community with regard to

Table P7: Future Parking Demand

<table>
<thead>
<tr>
<th></th>
<th>2025-2026</th>
<th>Estimated Driving Ratio</th>
<th>Estimated Presence Factor</th>
<th>Parking Demand</th>
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<tbody>
<tr>
<td>Employees [1]</td>
<td>6,933</td>
<td>95%</td>
<td>90%</td>
<td>6,330</td>
</tr>
<tr>
<td>Faculty</td>
<td>1,635</td>
<td>95%</td>
<td>98%</td>
<td>1,398</td>
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<tr>
<td>Staff</td>
<td>5,298</td>
<td></td>
<td></td>
<td>4,932</td>
</tr>
<tr>
<td>Students [2]</td>
<td>25,000</td>
<td>85%</td>
<td>100%</td>
<td>13,786</td>
</tr>
<tr>
<td>Resident [3]</td>
<td>3,623</td>
<td>100%</td>
<td>50%</td>
<td>3,097</td>
</tr>
<tr>
<td>Commuter</td>
<td>21,377</td>
<td>100%</td>
<td>90%</td>
<td>10,689</td>
</tr>
<tr>
<td>Other [4]</td>
<td>1,300</td>
<td>100%</td>
<td></td>
<td>1,170</td>
</tr>
<tr>
<td>Commercial Vendor [4]</td>
<td>750</td>
<td>100%</td>
<td>50%</td>
<td>375</td>
</tr>
<tr>
<td>Total</td>
<td>31,933</td>
<td></td>
<td></td>
<td>21,286</td>
</tr>
</tbody>
</table>

[1] Based on existing ratios of faculty and staff to students
[2] Based on existing percent of students living on and off campus
[3] Including Family Student Housing
[4] Based on existing ratios with the student population.
wayfinding, campus services, and emergency services (e.g., flat tire, locked car, etc.);
• specification of sign messages and placement with regard to parking (assuming that the overall design of a new wayfinding system will take into account this type of signs);
• management and operations of a campus transportation system, or management of a contractor to provide transportation services to the campus;
• long-term planning of appropriate parking facilities and transportation services to fulfill the needs of the campus;
• participation in the development of a funding strategy for transportation and parking services, and ultimate responsibility for the budget for these services;
• participation in more coordinated public information for campus, including parking and transportation information;
• liaison with the Police Department, Athletic Department, and other departments on campus with regard to special events, special needs, and desired services;
• participation in facilities planning, so that parking and transportation needs may be taken into account early and the effects of facilities planned for successfully;
• liaison with the public transit agency, the Las Cruces MPO, and other organizations relevant to the planning, management, and data collection on trips, trip reduction, uses of transportation modes, planning of Las Cruces transportation services, and the like; and
• implementing public information strategies to explain the need for changes, updating the campus on activities, and obtaining feedback to improve the systems.

This new Department should report directly to a senior administrative official, not through the Police Department – although coordination with Police will be an important ongoing function. Senior staff should already have parking certification through the International Parking Institute, or should be supported to obtain this certification.

Operations

Approved Wayfinding Package
NMSU needs to improve and update the following operations to meet the needs of the growing and changing campus:

- parking permits: pricing, upgrading from stickers to hang-tags (only one per person), and the allocation system;
- parking access and revenue control systems: development of a plan for funding and installing access controls and a centralized system on appropriate lots and in any new garage;
- parking enforcement: changes in enforcement routes and practices to match the changes in parking facilities and uses over time.

2. Coordination with Public Transit and Reduction of Parking Demand

In the future, the University should work closely with the Las Cruces MPO and RoadRUNNER Transit to ensure its student, faculty, and staff populations are being adequately served by public transportation. In order to reduce future parking demand, other transportation alternatives need to be seen by its users as relatively convenient and accessible. By mapping the locations where students, faculty, and staff live, it can be determined if there are concentrated areas of university populations and if they are within walking distance of one of the bus routes that serve the university. If they are not, the university should investigate working with RoadRUNNER and the MPO to operate a bus or shuttle service that targets these populations and their transportation needs.

Many universities and transit operators have attempted to attract university-related riders by giving every student a free transit pass, paid for either by a fee paid by all students or directly from the university. Except in dense urban settings, with extensive mass transit operations, experience has shown that while such a transit pass may slightly increase student ridership, it does so at a level disproportionate to the cost paid either by the student or the university. In general, the cost of riding on public transportation is not as much a deterrent as is the accessibility and frequency of transit. If people have to walk a relatively long distance to a bus stop, or must wait more than 15 minutes for a bus to arrive, they generally will tend to view the experience as inconvenient and will drive instead. Especially at NMSU, where parking permits are very affordable (when compared to other peer institutions) and some lots are even free.

Over time, as this plan is implemented and parking lots are replaced with buildings, it will become more important for the university to coordinate with public transit to ensure it is well connected and that its population is well-served.

3. On-Campus Transportation System

The University needs to develop a transportation strategy to support the campus vision and the Master Plan. This strategy will need to be developed in conjunction with changes in the permit system and in access controls. The strategy must have a strong financial component that is realistic in terms of raising funds to support transportation and using those funds to provide an appropriate level of service. The strategy should consider both circulation on campus and point-to-point services when necessary. It should also contain a monitoring function and capability, so that it may be altered effectively when data indicate that changes should be made to support actual behavior.

Part of the financial strategy should be devoted to the funding necessary for suitable and attractive shelters, blue-light safety phone locations, and information incorporated into the shelters.

4. Wayfinding and Visitor Parking

At a minimum, wayfinding as it is expressed in signs should contain the following components:

- Off-Campus Vehicular Directional Signs;
- Campus Gateways;
- On-Campus Vehicular Directional Signs;
- On-Campus Pedestrian Directional Signs; and
- Temporary Event Signs.

These signs should “brand” the University and operate from a similar design, with changes in scope and scale based upon

New Mexico State University has approved the design of a new wayfinding program that will incorporate most if not all of these elements in an attractive package. The parking signs, as shown in the designs, seem to emphasize the number of the parking lot. It is recommended that more emphasis be put on the information regarding who may park there and any restrictions as to hours, since these are the vital pieces of information for most parking patrons.

It is also helpful in signs for visitors to incorporate “Parking for” signs, as in “Parking for Museum” or “Parking for Admissions Office”. Visitors often do not know whether the visitor parking they first see is appropriate for their final destinations, so some assistance linking parking to major venues is desirable.

At a minimum, directions need to be provided to visitors as they enter campus from any of the possible entryways for vehicles. Visitor parking should be distributed throughout campus in appropriate locations, and guidance should be provided to let visitors know where they should park based upon where they are going.

It is recommended that the practice of directing visitors to go to the Parking Office for permits or parking information be ended, unless wayfinding signs to the Parking Office are incorporated throughout the campus. A more effective alternative is to designate specific visitor parking in several locations, guide visitors to this parking through the use of signs, and then monitor the use and occupancy of it to continually designate the appropriate number of spaces. Allowing visitors to park in a wide variety of lots on campus (even with a visitor permit) is not a good practice in an
effective campus parking allocation system. NMSU must move to this type of system over time in order to accomplish the goals of the Master Plan, and changing the behavior of visitors could start the process.

5. Bicycle and Pedestrian Improvements
A few, key steps need to be taken to improve the bicycle and pedestrian conditions in order to reduce the parking demand and to foster the growth of a pedestrian-scaled university campus:

**Lighting:**
- bicycle access
  - to and from campus,
  - on campus,
  - bicycle parking; and
- pedestrian access
  - Espina Street,
  - University Avenue, and
  - on campus

**Bicycle Access**
The Las Cruces MPO’s proposed improvements to the bicycle path network would greatly increase the university’s connectivity and accessibility within this network. It would provide bicycle facilities around the perimeter of campus as well as increased access to the residential areas to the north, east, and west of campus. The university, though, should independently evaluate which connections are most important and would have the greatest effect before allocating funds to be used for these purposes.

**Pedestrian Access**
Pedestrian access to the university will benefit from many of the recommendations this plan makes regarding University Avenue and the proposed re-design of Espina Street. The focus on Espina Street should be to make the street less inviting for motorists to speed through and make intersections easier for both pedestrians and drivers to navigate. Pedestrian and traffic signals may be necessary to ensure the safe and efficient movement of traffic through this important corridor.

On University Avenue the focus should be to create and foster the development of a truly pedestrian-friendly, city-university connection. This will help develop a sense of arrival, indicating to the pedestrian that they have arrived at a special place. Making it easier for pedestrians to cross this busy roadway, either by creating a median or refuge in the middle of the roadway, or by reducing its width, will significantly help to make both sides of University Avenue more accessible for pedestrians.

On-campus pedestrians will benefit from the creation of a more hospitable environment in which to walk. The installation of shade structures, better lighting, and landscaping will make walking between buildings and across campus more enjoyable and less of a chore. The creation of seating areas along the way will allow people to take a rest and relax, and interact with each other in ways that current environment does not encourage.

6. Roadway and Parking Facility Improvements
A roadway capacity reduction (or “road diet” as they are

**Figure P4: A Standard “Road Diet”**

![Figure P4: A Standard “Road Diet”](source: Federal Highway Administration)
Optimal Plant Site
Potential Central Plant Site
Existing Utility Tunnels
Existing Direct Buried Utilities
Future Utility Tunnels
Future Direct Bury
Existing Direct Buried to be Converted to Tunnel

Proposed Steam and Chilled Water Plan
sometimes called) involves reducing a four-lane roadway with moderate traffic volumes (less than 20,000 vehicles Average Daily Traffic volume) to two lanes and increasing pedestrian or bicycle amenities (wider sidewalks, bike lanes, medians or other landscaping, etc.). With the incorporation of left-turn only lanes where needed, it has been shown that reducing a four-lane roadway to a two-lane roadway will not significantly reduce the throughput of the roadway, and will greatly increase its aesthetic and pedestrian related functions. Traffic counts conducted by New Mexico Department of Transportation (NMDOT) in 2004 indicate an ADT of approximately 5,000 on Espina Street north of Stewart Street, thus making Espina Street a candidate for conversion to a two-lane roadway with a left-turn only lane and two bicycle lanes. This redesign of Espina Street will create a roadway that is more aesthetically pleasing and attractive and safe for pedestrians and bicyclists without reducing throughput or displacing traffic to other streets.

In parking facilities that have no pedestrian access, sidewalks and safe pedestrian entrances should be retrofit into the design. Any new parking lots developed should take into consideration pedestrian access, possible bus or shuttle access (drop-off and pick-up), location of blue-light safety phones (or intercoms), and other such amenities that will be necessary in the future.

7. Strategic and Long-term Planning with a Financial Strategy

The Parking Office operates on a self-sustaining financial model at present, and it will likely be required to in the future. Thus there is a substantial need to develop both short-term and longer term plans for changes in parking and transportation, with the accompanying financial strategy to support the plans.

The first phase of the future planning should be to develop short-term priorities that are necessary now in terms of operations, revamping the management structure, supporting other planning initiatives, wayfinding and visitor parking, the permit system, and transportation enhancements. The second phase needs to focus on preparing parking and transportation functions for the future roles they will play as the Master Plan is implemented, the campus populations grows, land is used for functions other than parking, and the need to adjust transportation modes to campus begins in earnest.

In all of the planning and changes to be made, there must be a significant public information component. Changing the attitudes and behaviors of NMSU faculty, staff, and students with regard to parking and transportation will be the most difficult tasks of all. Strong leadership and communications from the University administration will be necessary at every step, so that the campus will know that the new plans are in line with the strategic mission of the University and the Master Plan. Promulgating a new set of parking and transportation policies, and holding the discussions necessary to explain them, will provide a base for justifying the changes and beginning to grow campus support for them.

Utilities Infrastructure

The NMSU Conceptual Master Plan for campus facilities envisions many changes in the location of existing buildings, athletic facilities and expansion of campus buildings to the south which will represent a build out of available space between the two Interstate highways and University Avenue. The proposed facilities will require modification and expansion of the water, sewer, natural gas and storm drainage systems on campus.

As a primary step in determining the needs of current and future conditions on the NMSU campus, it is recommended that the University have new master planning documents prepared for each of their infrastructure systems. Master planning documents for these systems have either never been prepared or are out of date and should be updated. Modeling done during these master planning efforts should be the basis of modifications to and expansion of the existing infrastructure of each separate system as discussed below.

**Steam and Chilled Water**

Per the master plan, Table H-3 shows existing chilled water and steam loads. Based on the growth projections and growth direction, a central plant with 300% more capacity than the current central plant will be required to meet demand. The new plant should be located on the south side of campus near the campus research park. This central plant should explore the possibility of utilizing cogen or alternate energy sources. Sources of energy to be considered and studied are as follows:

- Wind
- Solar
- Bio-mass
- Thermal Storage

Of the alternate energy sources the most viable candidates would be wind driven turbines for power production, and/or solar power capitalizing on photo voltaic technology.

Although the main campus and the City of Las Cruces are not in a prime “wind resource” location, several “good” to “excellent” locations are located within fifteen (15) to twenty-five (25) miles of the campus (see New Mexico Wind Resource Diagram on the following page). A partnership with the City of Las Cruces or private partners, coupled with State and Federal incentives, make this a viable energy consideration to be studied.

NMSU resides in one of the best solar energy locations in the country. (See solar availability diagram below) With more than 3,200 hours of sunshine per year, solar power must be considered.

The driving forces making wind and solar viable sources of energy for the future are the current high energy costs and

<table>
<thead>
<tr>
<th>Period</th>
<th>Chilled Water (tons)</th>
<th>Steam (bhp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>4,500</td>
<td>1,800</td>
</tr>
<tr>
<td>2006-11</td>
<td>7,500</td>
<td>4,550</td>
</tr>
<tr>
<td>2011-16</td>
<td>13,100</td>
<td>9,650</td>
</tr>
</tbody>
</table>
advances in wind and solar technologies. Couple this with $20 million of incentives offered by the State of New Mexico to achieve a goal of 10% sustainable power generation by the year 2010, and the energy credits or incentives offered by the Federal Government; these energy sources must be considered.

In summary, NMSU has several opportunities to reduce energy costs and become a leader in sustainable energy utilization. The direction that implemented and the steps followed to achieve this goal must be evaluated in greater detail.

Electrical System

The following table indicates the current campus electrical demand and projected electrical demand for 2006-2011 and 2011-2016: The expansion of approximately 750,000 square feet on the north side of campus during the first five years can be accommodated using the available capacity of existing circuits, Circuit #5 and Circuit #6, from the existing Tortugas Substation. The utility expansion to facilitate the expansion beyond five years will require the addition of two to three new 25 KV distribution feeders.

The load density will increase from 3.43 VA/sq.ft. to 3.57 VA/sq. ft. in 2011-2016 is based on an increase of research space of approximately 675,000 square feet during that time frame.

New Mexico State University has expressed a consideration to procure a 115 KV transmission line from El Paso Electric to serve the campus. This consideration is based on a utility rate advantage for transmission level service. A life cycle cost analysis should be conducted to evaluate the potential advantages of a transmission level service.

An engineering analysis should be considered to compare the design philosophy of centrally distributed emergency/standby power versus local emergency/standby power generation as it relates to first cost, operational cost, maintenance, reliability and benefit to the master plan philosophies.

The hybrid 5 KV and 25 KV electrical distribution should begin to convert the campus to a complete 25 KV electrical
Tortugas Substation Circuit Legend

Existing Circuit No. 1
Existing Circuit No. 2
Existing Circuit No. 3
Existing Circuit No. 4
Existing Circuit No. 5
Existing Circuit No. 6
New Circuit No. 7
New Circuit No. 8 (serving new chiller plant - location to be determined)

Geothermal Substation Circuit Legend

Existing Circuit No. 1
Existing Circuit No. 2

Proposed Electric Plan
distribution system when economically feasible. Projects that require connection to the 5 KV distribution due to budget constraints should consider dual voltage transformers to allow future transition to the 25 KV distribution. Sustainable power options should also be explored as indicated in the Mechanical Systems, Part B – Future Considerations.

**Potable Water System**

It is recommended that a master plan be undertaken and include a model and calibration checks once the new water distribution system is operating. A study of this nature would map pressure, capacities, and fire flow capabilities within the system, revealing "bottlenecks" and other areas of concern. Once problem areas are noted, various scenarios could be modeled to assess and recommend options for addressing these issues. As part of this study, the fire flow issues east of Locust Street should be assessed and alternatives should be investigated to determine what type of fire protection measures may be appropriate at various locations.

The expansion of facilities to the south portion of campus will require extension of water lines to serve these facilities. Looping of the south portion of campus with water lines of approximately 12 inch diameter along the Interstate 25 and Interstate 10 frontage areas within the campus to tie in to both the well field and the storage tanks would be a conceptual starting point for serving this area. In addition, provision of adequate piping to serve the proposed facilities would most likely call for extension of large diameter water pipes along the extension of Payne Street, along Cholla Road and along the as yet unnamed roadway running perpendicular from Interstate 25 to Interstate 10 south of proposed parking lots adjacent to the baseball field. These pipelines, depending on fire flow requirements may be 10 inch diameter. Please see Figure W-2.

Additional pumping and storage capacity would also be required to meet the additional demands that the projected increase in students, staff and facilities will require. Water rights do not appear to be an issue of concern for NMSU and thus drilling of additional wells to provide the production needed would be the appropriate source. The
current efforts by the NMSU OFS to provide additional transmission capacity from the wells located on the west side of campus to the east campus storage tanks will improve current and future conditions and will provide for centralized treatment for any Safe Drinking Water Act parameters that the raw water supply does not meet. This will potentially result in substantial savings for treatment and re-pumping costs.

**Sanitary Sewer System**

It is recommended that a wastewater/sewer system master plan be undertaken to include a model developed to analyze capacity on campus and determine areas that may need attention. This study could include efforts to explore the infiltration problems that may be occurring throughout the system. Methods of quantifying infiltration in the system may include flow measurement, visual inspections, smoke tests, and televised inspections through cameras inserted into the pipes. If infiltration problems are found, the University may address them by installing ductile iron pipes in flood zones, by inserting rain bonnet covers underneath existing manhole covers, or other actions.

Proposed expansion of the campus will necessitate that NMSU’s sewer system be expanded to the south to serve planned facilities in that area. At this time, the only sewer service provided to that area of the campus is provided by a lift station and force main. The lift station is located in an area either within or adjacent to the existing 100 year floodplain. The southern portion of campus is a considerable distance from the existing sewer system and thus it is anticipated that a combination of gravity lines and a larger lift station located along the Interstate 10 frontage area will be needed to provide sewer service to this area as shown in Figure S-2.

With regard to the existing sewer system, the western portion of the system from the bottom of the horseshoe near Espina Street to the intersection of Interstate 10 and University Avenue is located in the 100 year floodplain as shown in Figure D-1. This area currently includes the parallel 18 and 12 inch sewer pipelines in Knox Street that carry almost 100% of the wastewater from the university. This line will need to be tested and modified to prevent inflow during...
Storm events and any additional sewer lines constructed in this area must be constructed to prevent inflow. The remainder of the campus sewer will also need to have an Infiltration/Inflow study done to ensure that no storm drains are connected to the sanitary sewer system. These efforts should be completed as part of the recommended system master planning.

**Natural Gas System**
A natural gas master plan would allow the University to model and consider the system’s capacity and operations. As mentioned, the University has indicated that new infrastructure may be served by the NMSU low pressure natural gas system. Without an accurate model, however, the capacity of this system cannot be completely understood. A model should be developed to assess the ability of the current system to accommodate additional demand and determine the need to establish new service areas or tie in points.

The infrastructure and gas feed required to serve the southern portion of campus will depend heavily on the demands of the facilities constructed in this area and may well require additional gas supply from the City, or if negotiated, wheeled through their system. Also, the main low pressure gas feed is currently located at the intersection of Espina Street and University Avenue. It is understood that, with the proposed construction of the Performing Arts Center, the University may want to either relocate or modify the appearance of the regulator station. This action may be accomplished through negotiation with the City of Las Cruces Utility Department.

**Storm Water Drainage System**
Numerous changes have occurred on the NMSU campus since their last Drainage Master Plan was prepared in 1995. A new plan would help the University to better analyze problem areas and explore strategies to improve drainage in these locations. The University, for example, has indicated that they may want to install a check dam on College Arroyo to address some of the flooding problems that occur when the arroyo meets Stewart Street. A new drainage plan could assess different placement and design options for this structure and assess its likely success in alleviating problems.
at this location and downstream. The plan could also address the drainage problems along Triviz Street, recommending various options that could be used to alleviate these issues. A new plan should address drainage on the east campus (this portion of the campus was not addressed in the 1995 study). The east campus is projected to experience a significant amount of development over the next decade. Drainage considerations should be well understood and planned for as these projects move forward. As development occurs on the east campus, it is recommended that increased flows be addressed locally and not be conveyed to the west campus where drainage problems are already being experienced. A new drainage plan would assist in planning for and implementing this recommendation.

The proposed improvements within the floodplain include the athletic facilities east of the stadium, the south end of the stadium, the proposed parking lot south of Wells Street and potentially the wastewater lift station located adjacent to Interstate 10. These impacts could be mitigated by construction of facilities above the floodplain elevations. NMSU may also consider modification of the Tortugas Arroyo through coordination with the Federal Emergency Management Agency (FEMA) and filing of Conditional Letters of Map Revision (CLOMR) or other appropriate documents for modifications of the drainage channel. In addition to the Tortugas Arroyo, the Mission Bell Arroyo, Cholla Arroyo and an additional unnamed arroyo flow across the southern portion of the campus generally perpendicular to Interstate 25. These arroyos also appear to cross areas proposed for construction of facilities. Thus FEMA and/or U.S. Army Corps of Engineers coordination may be required for these arroyos as well.

Within the developed portion of the NMSU campus, the College Arroyo has substantial potential for impacts to the newly constructed freshman dormitories, Garcia Hall and the student housing proposed to be constructed between Locust Street and Aggie Memorial Stadium. These issues should be addressed in the recommended drainage master plan as discussed above.

**Recommendations**

The Master Plan effort is targeted to:

- Improve pedestrian traffic access to campus classrooms and facilities
- Improve the visual impact of the campus from adjacent roadways and within the campus.
- Provide additional green space and shade and displace parking within the core campus to create a more inviting ambiance for students, staff and visitors and as a result encourage pedestrian traffic, soften the appearance and create a less harsh environment.
- Provide infrastructure to support an anticipated increase of approximately 10,000 students over the 10 year planning period, which will require demolition of poorly suited facilities and construction of new facilities.

The anticipated impacts of the proposed improvements to meet these goals will result in:

- Increased water demand and density of water demand on campus in addition to expanding the water distribution system to cover approximately 40% more area than currently served.
- Expansion of green space on campus creating significant increases in water demand and pipeline flow rate capacity demand.
- Increased wastewater discharge from facilities on campus requiring expansion of the wastewater system to the southern portion of the campus.
- Increases in natural gas demand on campus, depending on the choice of systems for heating the additional facilities.
- Construction of facilities within the 100 year flood plain and other drainage routes.
- Demolition of some buildings and construction of new buildings in different locations.

In addition to the impacts of the planned improvements, existing deficiencies in campus utility systems should be addressed to support the proposed improvements as well as improve service to existing customers. Recommendations for meeting utility infrastructure challenges are:

- Prior to implementation of the Conceptual Master Plan improvements proposed under this effort and using this
projects are performed in a consistent manner and the University has recourse if their standards are not properly adhered to. These standards could be similar to those currently used by the City of Las Cruces and should be developed as part of the recommended system master planning. Examples of specific standards that University staff has indicated they would like to see implemented are listed below.

**General**
- Location tape: All buried utilities should have warning tape/wires for future location.
- Utility setbacks: All utility installation should observe standard setbacks from other utilities.
- Pipe strength: All buried pipes should have a high strength capacity (C900 or similar).

**Potable Water System**
- Minimum pipe sizes: Main water pipes should be a minimum of 8” and feed branches should not be less than 6” for small facilities and 8” for larger facilities (and/or those facilities that have a sprinkler system).
- Minimum covers: All water lines should be buried with a minimum of 4 feet of cover, or installed using ductile iron pipe if not feasible.

**Sewer System**
- Minimum pipe sizes: All collectors within and exiting buildings should be a minimum of 6” in diameter.

**Storm Water Drainage System**
- Arroyo easements/setbacks: Development should be setback from undeveloped (natural) arroyos a minimum distance of half the width of the arroyo plus the maximum estimated lateral erosion to allow the arroyo to erode and meander. Development should not encroach on this distance unless proper engineered improvements have been designed and implemented, such as: bank stabilization, channelization, floodwalls, etc.
- Crown roads: Roads should be crowned so that water is conveyed within the street gutters and a given width of the road is left passable during smaller design storms.
- Minimum slopes: Roads should have a minimum slope to encourage proper drainage of water toward ponding areas.

NMSU staff has indicated that it would be helpful to have standards formalized and documented so that all future projects are prepared for each utility that currently does not have an existing utility system. The demolition and anticipated construction of new facilities over existing utilities pipelines will have an impact on existing utilities on campus by causing interruptions of service, delays in construction and adding cost to projects through necessity for delaying contractors, emergency repairs and relocations.

This knowledge will also be critical in the preparation of the Master Plan system models, which are used for determining proper sizing of pipelines, the need for additional piping, looping, pressure zone breaks and other issues critical to the water system in particular. Sizing of wastewater lines will also be critical due to expansion of the system and increase in anticipated discharge.

• Use the master planning to identify existing deficiencies in systems for meeting peak demands, fire flow and irrigation demands in the water system. It should also determine the available capacity, conditions of pipelines (cracks, corrosion, bows or dips and inflow/infiltration) in the wastewater system.
• Update the Drainage Master Plan. This is critical for the safety of students, staff and visitors and the structural integrity of buildings and other facilities potentially impacted by storm water events.
• Use master planning to develop standards for future improvements to the civil infrastructure on campus.
• Recommendations for sizing or location of utility infrastructure would be very general estimates and may be misleading without the efforts described above.

As an integral part of these Master Plans, determine the location, capacity and material of the pipelines making up these systems. The demolition and anticipated construction of new facilities over existing utilities pipelines will have an impact on existing utilities on campus by causing interruptions of service, delays in construction and adding cost to projects through necessity for delaying contractors, emergency repairs and relocations.

This knowledge will also be critical in the preparation of the Master Plan system models, which are used for determining proper sizing of pipelines, the need for additional piping, looping, pressure zone breaks and other issues critical to the water system in particular. Sizing of wastewater lines will also be critical due to expansion of the system and increase in anticipated discharge.

• Use the master planning to identify existing deficiencies in systems for meeting peak demands, fire flow and irrigation demands in the water system. It should also determine the available capacity, conditions of pipelines (cracks, corrosion, bows or dips and inflow/infiltration) in the wastewater system.
• Update the Drainage Master Plan. This is critical for the safety of students, staff and visitors and the structural integrity of buildings and other facilities potentially impacted by storm water events.
• Use master planning to develop standards for future improvements to the civil infrastructure on campus.
• Recommendations for sizing or location of utility infrastructure would be very general estimates and may be misleading without the efforts described above.

NMSU staff has indicated that it would be helpful to have standards formalized and documented so that all future
Five Year Plan - 2006 to 2011
The Five Year Plan – 2006 to 2011 represents the implementation of projects that were identified on the Five Year Facilities Plan as well as other projects proposed within this timeframe that will be funded partially by other means. These projects include:

1. University Hotel and Conference Center – This project is meant to be built and managed under a long-term lease agreement with a private developer.
2. Phases I, II and III of the Arts Complex and associated streetscape landscape improvements along University Avenue – this will require the relocation and renovation of Nason House to the east side of O’Loughlin House.
3. Gardner Hall Renovation and Expansion and associated streetscape improvements along University Avenue.
4. College of Business Facility and associated landscape improvements along University Avenue.
5. Jordan Street Entrance to include two stories of graduate student housing above a mixed use first floor with associated streetscape improvements along University Avenue and a five story parking garage. The oval campus open space/green will replace the parking lots on the east side of Milton Hall with a trellis structure to be constructed along the western face of Corbet Center. The first phase of the north/south pedestrian path will be extended from the open space to Stewart Street.
6. Student Service Facility Phase 1 and associated landscape improvements to the I-Mall.
7. Native American Cultural Center.
8. Technology Lab / Classroom facility and associated landscape improvements along I-Mall and completion of the oval campus open space/green on the west side of Milton – this will require the demolition of Hardman and Jacobs Halls and the Zohn Theater.
10. Covered Livestock and Equestrian Arena, horse barn or 5 horses and a feed storage barn to include reconfiguration of horse pens and outdoor arena.
11. Expansion of Arrowhead Center – these projects will most likely be built by private developers.
Existing Buildings
Proposed Buildings
Buildings Constructed in previous cycles

Ten Year Plan 2006-2016
The Ten Year Plan represents implementation of projects that begin to address the expansion of and relocation of programs to fulfill the long term goals of the University. These projects include:

1. The Las Cruces Center and associated streetscape improvements along University Avenue. This project will be funded and managed by the City of Las Cruces. NMSU would make land available via a long term lease arrangement.

2. Potential mixed use building to include graduate student housing on the second and third floors with service/retail on the first floor and associated streetscape improvements along University Avenue.

3. Potential mixed use building to include graduate student housing on the second and third floors with service/retail on the first floor and associated streetscape improvements along University Avenue. This project will require the demolition of the existing sorority housing and relocation of the Greek organizations to other facilities either on or off campus.

4. Student Services Building Phase 2 and associated landscape improvements along I-Mall. This project will require the demolition of Monagle Hall.

5. New undergraduate student residence hall to replace Monagle Hall and associated landscape improvements along I-Mall.

6. Potential mixed use buildings at Pan Am Plaza and associated streetscape improvements along University Avenue. This project will be funded and managed by the existing lease holder.

7. Student Apartments Phase 2 on Alumni Dorms site and first phase of the north/south pedestrian path between Regent’s Lawn and Stewart Street.

8. Potential housing for married students without children and associated landscape and streetscape improvements along Stewart Street.

9. Proposed expansion of student activities building and associated streetscape improvements along Stewart Street and the extension of the north/south pedestrian path. This project will require the demolition of Rentfrow Gym.

10. Academic/research buildings in a configuration that creates landscape courtyards and streetscape improvements along Knox, Espina and Stewart Streets. The Food Technology Building and retail shop will occupy the building south of Knox Hall and Frenger Street will be converted to a pedestrian mall connected to the parking lot on the west. A pedestrian plaza will be located at the center of the block. Demolition of several buildings within the block between Frenger Street on the north and Stewart Street on the south and between Knox Street on the west and Espina Street on the east is required including: Neale Hall, the judging barn, the sheep barn, and the Tejada Building.

11. Parking lot expansion requiring demolition of several small structures currently used within the animal sciences department.

12. Metabolism and Surgery replacement building

13. Processing Lab Building with adjacent animal pens for sheep and cattle

14. Expansion of Arrowhead Center – these projects will most likely be built by private developers.

15. Regent’s Lawn landscape improvements to include new paths, landscaping, and expansion of the duck pond. The combined water feature will be equipped with an automatic fill feature and recirculation and filtering device. Landscape shall be naturalistic to include bridges, paths, seating, shade structures, trees, boulders and water falls to take advantage of the topography.
Fifteen Year Plan 2006-2021
The Fifteen Year Plan represents implementation of projects that begin to address the expansion of and relocation of programs to fulfill the long term goals of the University. These projects include:

1. Potential mixed use building to include graduate student housing on the second and third floors with service/retail on the first floor and associated streetscape improvements along University Avenue. This project will require the demolition of the existing sorority housing and relocation of the Greek organizations to other facilities either on or off campus.

2. Expansion of the Zuhl Library to consolidate all library resources on the new campus opens space/green. This plan requires the demolition of the Breland Hall addition.

3. Academic/lab building and associated landscape improvements to Frenger Street Mall and extension of north/south pedestrian path from South Horseshoe Drive to Gregg Street.

4. Academic buildings and associated streetscape improvements on Stewart Street.

5. Academic/lab building and associated landscape and streetscape improvements on Stewart, Knox and Espina Streets. This project requires the demolition of Stucky Hall, the Swine Building, and the Cattle Barn.

6. Research/Lab buildings and associated streetscape improvements to Espina and Wells Streets with extension of north/south pedestrian path from Stewart to Gregg Street. This project requires the demolition of the existing PSL shops and five single story block buildings.

7. Academic/Lab building and associated landscape and streetscape improvements on Stewart and Williams Streets to include pathways across Presiado Park.

8. Athletic program expansion

9. Greek housing or family housing replacement and associated streetscape improvements along Wells and Locust Streets. The project will require the demolition of existing Greek housing, Wells Hall, theatre scene shop, cosmic ray lab, housing storage

and the relocation of Ag and flammable storage.

10. Athletic program expansion

11. Softball and soccer complex, parking and associated streetscape improvements along Stewart and Payne Streets.


13. Expansion of Arrowhead Center – these projects will most likely be built by private developers.
The Twenty Year Plan represents implementation of projects that begin to address the expansion of and relocation of programs to fulfill the long term goals of the University. These projects include:

1. Academic/Lab building and associated landscape and streetscape improvements on Stewart and Williams Streets to include the turn-around at Frenger Street Mall. This plan requires the demolition of Regent’s Row Dorms.

2. Academic/Research Buildings and associated streetscape improvements on Gregg, Espina, Wells and Williams Streets. Extension of the north/south pedestrian path between Stewart and Wells Streets. This plan requires the partial demolition of Tom Fort and Sutherland Village.

3. Academic/Research Buildings and associated streetscape improvements on Gregg, Espina, Wells and Williams Streets. Extension of the north/south pedestrian path between Stewart and Wells Streets. The plan requires the demolition of the remainder of Tom Fort and Sutherland Village.

4. Family housing village and associated parking with associated streetscape improvements along Locust Street. Extension of the north/south pedestrian path between Stewart and Wells Streets. This plan requires the relocation of softball and baseball.

5. Athletic program expansion

6. Recreation field expansion. This plan will require the relocation of the Facilities and Construction offices and the fire station.

7. Expansion of Arrowhead Center – these projects will most likely be built by private developers.

8. Expansion of Arrowhead Center – these projects will most likely be built by private developers.
Beyond Twenty Year Plan 2026+

Existing Buildings
- Buildings Constructed in previous cycles

Proposed Buildings
- 1
- 2
- 3
The Beyond Twenty Year Plan represents implementation of projects that begin to address the expansion of and relocation of programs to fulfill the long term goals of the University. These projects include:

1. Academic/Research Buildings and associated streetscape improvements on Wells and Williams Streets and Sam Steel Way. This project will require the demolition of student family housing.
2. Academic/Research Buildings and associated streetscape improvements on Standley Drive and Sam Steel Way student family housing. This project will require the demolition of student family housing.
3. Academic/Research Buildings and associated streetscape improvements on Standley and Research Drive. This project will require the demolition of the Genesis Center.

**Recommendations**

The master plan process revealed the need for additional studies to be performed. These include:

1. Housing Master Plan – The master plan calls for a significant replacement in the housing on campus. The existing family housing located along I-10 will be relocated to the area adjacent to the recreation fields. A detailed market analysis and financial proforma needs to be done to evaluate the markets that need to be accommodated on campus.
2. Transportation and Access Master Plan – The master plan recognizes a significant growth in population and facilities on campus and proposes significant changes in parking location and management. A detailed plan that incorporates regional transportation influences and establishes a multimodal strategy need to be developed to ensure the most beneficial outcome for the University.
3. Jordan Street Entrance Area Plan – The master plan proposes a significant change in the arrival sequence at Jordan Street and the development of a new open space at Milton Hall. The plan envisions mixed use buildings be located along University Avenue to include student housing and a new parking garage. A detailed planning study needs to be done to establish program and budget so that implementation of the project can move forward.
4. Infrastructure Utilities Master Plan – In order to be sure that the development required to meet NMSU’s goals can be accommodated, a master plan for all utilities needs to be done to quantify existing capacity, project necessary changes to systems and explore alternatives to existing energy sources. This master plan would establish a schedule and probable budget for the 20 year duration of the planning cycle.
Land Use

The main campus of NMSU is separated by I-25 and consists of 900 acres west of the interstate and 2,500 acres east of the interstate. The main academic area is located on the west portion of campus with its western boundary being defined by I-10, its north boundary by University Avenue and its southern boundary the interchange of the two interstates. This portion of the campus is defined by its proximity to the Rio Grande River valley and the campus’s agricultural heritage. The east campus is primarily desert mesa in character with the exception of the University golf course. Uses occupying the east campus include the president’s home, water storage tanks, storage lots of salvaged NMSU vehicles and environmental, health and safety storage trailers and the rodeo facility. The Elephant Butte Irrigation District owns land in the midst of the east campus that is dedicated to a dam/water quality control basin that intercepts water from the Tortugas Arroyo. Water is released from the dam as overflow via a spillway. Storm water drainage will be discussed later.

The west campus academic zone has developed on a primarily east/west manner with walking distances increasing to the point that it is difficult for students to make the 10-minute class change schedule. The central portion of campus has seen the most concentrated development over the years although the density of development on campus remains low and numerous small parking lots occupy valuable land. Undergraduate student housing is located at the eastern end of the academic area with family housing located in the southwest. Arrowhead Research Park occupies the southern end of campus but is undeveloped with the exception of one small facility owned by General Dynamics. The western end of campus is primarily devoted to cultivated fields, feed and storage lots and parking with the eastern edge fronting I-25 dominated by open gravel parking and undeveloped desert.

NMSU’s visibility from the interstates and thus a clear sense of arrival to campus is unclear even though the campus boasts significant frontage on both interstates. Approaching campus from the south along Interstate 10 the views include the undeveloped desert zone dedicated to Arrowhead Research Park, NMSU’s aging family housing stock, the Dona Ana campus’s parking lots, the animal feed lots and open cultivated fields on the western end of campus. Approaching campus from the south along Interstate 25 the views include a greenhouse complex on land leased in Arrowhead Research Park, open desert, the football stadium and golf course. It must be noted that the University doesn’t have signage on its property identifying the main campus or the exit needed to arrive although there is a sign in front of the Dona Ana central campus with a small NMSU logo attached. One NMDOT sign on each interstate right of way indicates University Avenue as the appropriate exit for the campus. Existing signage will be discussed later.

The perception of campus from University Avenue is reflective of suburban zoning in that University uses and city-developed uses are separated by a high speed arterial collector street. As a result NMSU has internalized itself by developing building facades and entries that address the campus with numerous entrances dedicated to service areas and parking lots facing University Avenue with no clear hierarchy for arrival to campus evident. Private uses on the city-owned north side of the street have developed in a manner that serves a primarily automobile dependant clientele. Pedestrian-scaled amenities are almost none existent on both sides of the street as a result of this pattern of development.

Historic Resources

There is a wide variety of buildings at NMSU including vernacular adobe construction, Prairie Style, Mission Style and Art Deco. The prevailing style is Spanish Colonial Revival which was popular from the early to mid 1900’s. Spanish Colonial Revival is very similar to the Mission Style with stucco and red clay tile roofing as the primary materials. Common architectural elements include bell towers, arched portals, arcades and overhanging eaves with exposed rafters. Spanish Revival differs from Mission Style in that it has more decorative elements such as ornamental door surrounds, decorative elements and the bell towers are more stylized and symbolic.

Historically the most significant buildings on campus are those designed by Henry Trost. They are some of the oldest buildings on campus, were built in the context of Trost’s master plan for the campus, and Trost was a significant architect practicing out of El Paso, Texas, influencing the
Existing Campus Plan
architecture of the Southwest in the early 1900’s. The buildings attributed to Trost are: Conroy Honors Center, Goddard Hall, the Music Building’s Practice Hall, and Nason House.

Foster Hall and Young Hall are credited to Trost in some documents. There are conflicting dates on Young Hall. One document states it is a 1911 Trost design and another says it was built in 1928. Trost died in 1933 so if it does date to 1928, it may or may not be a Trost design. Foster Hall is credited to Percy McGhee on the New Mexico Historic Register. Regardless, all of these structures are listed on the National Register of Historic Places except the Music Building, which should be. Regardless, they all merit a high degree of respect for their siting, context, design and continued preservation. Nason House could probably benefit from a more conducive use. Conroy Honors Center and the Music Building are the most well-preserved and intact of the historic buildings (interior and exterior) and are acknowledged and respected in the master plan.

The next set of buildings that are significant are a series of dormitories that were built from the late 1920’s to the 1950’s They are Kent Hall, Rhodes-Garret-Hamiel Halls, Garcia Annex and Breland Hall. As a group, they are a wonderful representation of the Spanish Revival style. At least one of them (Kent Hall) was designed by Percy McGhee, who followed Trost’s style for the buildings he designed for the campus. McGhee also designed other significant buildings in Las Cruces such as the library and the Dona Ana County Courthouse both on the register but in the Pueblo style. Rhodes-Garret-Hamiel Halls have strong sentimental ties to the university and are listed on the New Mexico State Register of Historic Places. These three connected dormitories create one of the few formal courtyards on campus and is a well defined outdoor space.

Garcia Annex occupies a very prominent spot at the crest of a hill terminating the east end of Frenger Street Mall. It also has a significant interior space in the Spanish/Mission style. Breland Hall has a modernist addition that fills what was once a courtyard defined by the building’s wings. Together, Garcia Annex and Breland Hall (if pictured without the addition) begin to define an outdoor space similar to that of Rhodes-Garret-Hamiel. There is an opportunity to enhance this space if Breland’s addition were to be removed. Kent Hall serves as the University Museum and is the oldest and most traditional Spanish/Mission style building of this group. Its location on University Avenue and the integrity of its overall mission style are noteworthy.

The third area of significance is the Horseshoe and the buildings that define it. Trost’s original master plan concept was not fully realized, but the placement of the Biochemistry Building, Gardner Hall, and Jet Hall at least acknowledge the original concept of buildings surrounding a green. Dove Hall attempts to complete a statement of symmetry with Young Hall at the eastern edge of the Horseshoe. They are a collection of similar scale and designed academic buildings that incorporate aspects of the Spanish Revival style in a modern architectural vocabulary.

There are several historic structures on campus that don’t quite fit into the geographic or historic contexts as the buildings listed above. However, they are noteworthy only for their contribution to the architectural style of the campus. They are: the Biology Annex, The Astronomy

Conroy Honors Center

Kent Hall Courtyard
Existing buildings to remain
Buildings currently on the State and National Registers
Buildings currently on the State Register
Buildings to be further investigated
Cultural Landscapes

Historic Properties Plan
Building, Milton Hall, and Williams Hall. The Biology Annex is as well executed in the Mission Style as any of the Trost buildings but it appears out-of-place on the campus due to the new development that surrounds it. The Astronomy Building is almost identical to Gardner Hall and of the same vintage, but it has no relationship to the Horseshoe. Milton Hall has very high-style exterior elevations, but a series of interior renovations do not correspond to the exterior massing making it inefficient. This building, like Rhode-Garret-Hamiel Halls, has strong sentimental value and a certain degree of exterior architectural integrity.

Williams Hall, originally designed as a Gymnasium, was adjacent to the old stadium and had some importance to the athletics culture of campus. The stadium has been demolished and Williams Hall was remodeled for the Art Department in the 1970’s. The modern additions to Williams Hall and the complete interior renovation compromise the building’s historic integrity and with the demise of the stadium, Williams has lost its value and historic context.

There are two significant structures on the edge of the campus: The Nematology Building and the horse paddock. The Nematology Building is the oldest building on campus. It is adobe construction and has served the university in a variety of functions over the years including an experiment station and the University Museum. Since this building is the first building on the campus site (it is mentioned in Ms. Grumet’s books as having been already on the ranch land that was purchased for the college) and has served an agricultural purpose for most of its existence. This building and its site deserve special consideration for preservation and interpretation as a vernacular structure. The Horse paddock is also an adobe structure and is also an example of vernacular construction but doesn’t have the same degree of significance as that of the Nematology Building.

In summary, buildings that are historically significant and call for continued reservation/restoration of structures and site context: Conroy Honors Center, the Music Building’s Practice Hall, Nason House, Goddard Hall, Foster Hall, Young Hall, and the Nematology Building (restoration). Buildings that contribute to the historic architectural context of the campus and merit continued preservation/future restoration: Kent Hall, Rhode-Garret-Hamiel Halls, Garcia Annex, Breland Hall (with future demolition of the addition and restoration to restore the courtyard and north façade), Biochemistry Building, Gardner Hall, Jet Hall and Dove Hall.

Marginally significant historic structures that maybe considered for demolition include: Horse Paddock, Williams Hall, Biology Annex and the Astronomy Building.
Existing Landscape Pattern
Campus Landscape
New Mexico State University has a diverse landscape characterized by large open lawns such as the historic horseshoe at the east of the academic district and the Regent’s lawn in the existing housing district, the cultivated fields on the western end of the campus, and its informal oasis-style landscaping surrounded by a desert mesa. The major east/west promenade – the International Mall - provides a strong pedestrian oriented framework to the campus in an informal setting. The campus includes a series of generally unrelated courtyards and plazas with a wide variety of landscape styles. Similar to many campuses, much of this landscape has taken on a somewhat manicured character of trees, shrubs and turf grass requiring high levels of irrigation and maintenance.

The master plan focuses on creating a central core with a strong sense of place, a perimeter identity that relates to its surroundings, a related open space framework of quads, courtyards and plazas and pedestrian promenades while introducing a more sustainable landscape palate. To achieve a balance between the many factors influencing the organization and character of the campus, several guiding principals have been established:
• Unify the appearance of the campus while creating a distinct assemblage of trees, shrubs and groundcovers that recognize the regional landscape, agricultural heritage, and distinct landscape zones of Las Cruces;
• Preserve and enhance views to the Organ Mountains and A Mountain in particular;
• Reinforce the University’s identity by using an integrated approach to landscape at entry points and the campus perimeter;
• Develop a landscape vocabulary that unifies building styles and creates a unique sense of place for the major campus open space areas;
• Provide a hierarchy and diversity of outdoor spaces that support special events and daily academic life;
• Reinforce the existing pedestrian circulation system and establish pedestrian circulation in areas currently not well-served;
• Establish human scale in the pedestrian environment;
• Respond to climatic considerations by establishing comfortable micro-climates and providing shade along walkways and in outdoor seating and gathering areas;
• Convey both the sense of and the actuality of security and safety;
• Minimize the visual, thermal and acoustic impacts of automobiles and parking facilities and soften and/or screen undesirable features in the environment;
• Conserve resources by recognizing the need for sustainability, economy and ease of maintenance; and
• Integrate proposed and existing natural systems detention basins, drainage ways, plant communities into the fabric of the campus.
Based on these principles, an open space/circulation framework has been developed as the organizing element for the campus that will serve as the foundation for the master plan. This framework emphasizes the proper relationship between buildings, parking, pedestrian circulation and open space. It will not only enhance the quality of the campus environment and reinforce the identity of the University, but also establish a framework for future growth and development of the campus.

Key components are:

- Existing Landscape Patterns
- Campus Landscape Zones
- Edge and Identity
- Campus Entries
- Pedestrian Circulation
- Campus Greens
- Courtyards
- Campus Roads and Parking
- Hardscape, Site Lighting and Site Furnishings
- Sustainability
- Implementation

**Existing Landscape Patterns**

In general the planting of NMSU reflects a time when an east coast style of lawns and broad canopy trees were used to attract people to the campus and the desert in general. Many areas of the campus are lush with attractive mature canopy trees. Over time more desert and drought tolerant plantings were added to new developments on campus. With this there is a wide variety of styles and plant material that sometime abut one another. Fundamental to the University’s identity is the landscape character of its open spaces. Currently the NMSU campus can be generally characterized as a largely informal complex consisting of a series of informal park like greens, building plazas and courtyards and other landscape areas that are largely lush, green and irrigated. However, this type of landscape planting is highly maintenance and irrigation intensive and the University has utilized a more “sustainable” palate in recent landscape projects. The wide variety of trees on campus is noteworthy – however the open space system generally lacks structure and strong identity.

**Edge and Identity**

University Avenue is the primary urban edge with mature evergreens to some extent and a variety of building setbacks. This edge lacks a strong relationship with the street and adjacent development. While the existing trees and low stonewall establish a readily identifiable edge along the frontage, the majority of the frontage is inconsistent and lacks pedestrian scale. The lack of a landscape parkway along the street further detracts from the overall character of this landscape. The dense planting of pines trees act as a dark barrier rather than creating a pleasant welcoming landscape edge.

While Interstate 10 and Interstate 25 serve as the primary approach to the campus from the north, west and south, the University lacks any consistent identity along these important corridors. Pine trees are used for screening, but as a tree species it is more often successful screening unwanted views rather than providing a dramatic statement.

The west campus edge is home to animal yards and various agriculture-related uses that at the present have a cluttered and “back of house” appearance. The southern portion of the campus is largely undeveloped desert scrub which is undistinguished as campus property.

**Campus Entries**

In spite of recent campus identification monuments, the campus lacks the strong presence and visual identity appropriate to its size and role within the community. Existing sign walls are located at the appropriate locations but are small and lack the civic quality an institution should portray. The landscape should reinforce the signage and be bolder to draw attention to the motorist.

The University has done recent plantings of double rows of Pecan trees formally spaced to denote campus entries at Union Street and College Drive. This adds a nice formality and strong identity to the campus.
Campus Roadways
Portions of internal streets such as Stewart, Wells, Espina and portions of Locust have mature canopy trees informally spaced with mixed evergreen and deciduous varieties of mostly exotic trees. The variety of trees various and planting is limited to building edges. Most of the streets lack a signature or dominant tree. While the mature trees are pleasant, there is a lack of continuous or consistent planting. Wells Street is notable because of the existing median that gives it a unique identity on campus. The parks and recreation areas have many mature canopy trees that provide green edges to the streets.

Pedestrian Circulation
The existing pedestrian circulation of the campus is currently focused on a loose hierarchy of walkways and paths characterized by the dominance of the east/west International Mall and Frenger Street Mall complimented by more informal secondary systems of walks and paths. Most of the north/south pedestrian movement runs alongside existing streets. Many conflicts with automobiles and pedestrians exist. As previously mentioned services vehicles pose a problem not only with pedestrians but also with the landscape. Vehicles were observed parked on lawn areas and on top of tree roots, which could result in compacted soils, poor drainage and potential decline of mature trees.

Campus Greens
There are several signature spaces on campus and some of the planting is more residential than collegiate. Primary campus greens include the Horseshoe Lawn, and the Regents Lawn. At the west terminus of the International Mall, the Horseshoe lawn is the historical center of the campus with a wide lawn and mature canopy trees placed informally around the edges. Landscape features in this area include the historic gate, windmill and Knox Hall water feature.

At the eastern terminus of the mall is the Regents Lawn and duck pond. The pond has been noted as a favorite spot within the community. The duck pond lacks seating, shade and could benefit from landscape enhancement that provides spatial definition and a picturesque setting. The Regents Lawn and Grove could benefit from added pedestrian features. A small amphitheater is located east of Corbett center.

Courtyards, Front yards and Side yard
At present there are a number of smaller courts and yards that are notable for their landscape treatment and success in providing places to gather and contemplate. These include Zuhl Library courtyard, business school courtyard, Chemistry courtyard, Kent Hall, areas outside of the Corbett Center, Rhodes, Garret, Hamiel Halls courtyard and the Aggie Memorial. The landscape of these areas is distinct and successfully defines the space. In several instances building side yards have exposed utility cabinets that detract from the campus appearance.
Transportation and Access
New Mexico State University (NMSU) has slightly over 12,000 designated parking spaces in surface parking lots and along streets, with another approximate 2,800 spaces in unmarked and unpaved lots that are used primarily for special and athletic events. In addition, there are other smaller unpaved lots that do not have space estimates. TABLE P1 calculates the existing parking supply by category, and FIGURE P1 illustrates the locations of the parking supply.

Of this parking supply, 115 spaces are designated specifically for visitors, while 170 meters serve both visitors and short-term parking needs of the campus community. Members of the campus community are required to obtain parking permits, and some lots are restricted to faculty and staff, commuter students, or resident students. Nearly 5,400 spaces are available for all permits. Permit prices are illustrated in TABLE P2 below, followed by Table P3 describing the options for visitor parking, including permits.

Individuals who park in restricted lots (e.g., faculty/staff or resident student) must purchase parking permits. However, students, faculty, staff, retired employees, or commercial vendors may park in the free lots without purchasing a permit. In addition, students, faculty, and staff may purchase more than one permit for an additional fee. Data on the individuals who purchase multiple permits is not kept. As a result of the lack of registration of all vehicles, as well as the nature of permit data kept, it is impossible to accurately identify the number of vehicles actually permitted, as well as the number of NMSU vehicles on campus at any given time.

Parking Demand
Parking demand is estimated from the parking permits sold, as well as estimates of driving ratios (how many individuals in the various categories drive to campus) and presence on campus (of those who drive, how many are on campus at a typical peak time and day). These estimates are used because data on parking occupancy are not systematically collected at NMSU.

The caveats related to this table include the fact that not all NMSU faculty, staff, and students purchase permits, and multiple permits may be purchased by individuals as well.

On most university campuses, a higher number of staff employees are typically on campus due to the nature of their work. Faculty members may not be present because they do not teach on a particular day, they may be at a conference or giving a lecture off-campus, etc. Resident student vehicles are usually on campus during the peak hours of campus, since they are in classes. Later in the day they may be off-campus at work, shopping, or meeting with friends. Commuter students come and go throughout the day, and it is estimated that approximately 50 percent of them are on campus during the peak period. Visitors have a variety of ways to park on campus, varying from registration and a permit to no registration and no permit to parking at a meter. Thus estimating exactly how many visitors may be on campus at any given time is impossible under the existing circumstances.

While on most campuses it would be unusual to estimate a parking demand in excess of parking permits and a factor for visitors, it is entirely possible for this to happen at NMSU. Faculty, staff, and students may park on campus without permits, so at any given time there are many vehicles on campus without permits that are parked legally.

Parking Management
The Parking Office is part of the Specialized Services unit of the NMSU Police Department. The Parking Office reports to the Police Department, which in turn reports to the Senior Vice President for Planning, Physical Resources and University Relations. Seven full-time employees and approximately 20 part-time student employees comprise the Parking Office. The students are used primarily to write parking citations, as well as to assist in other parking activities.

Since 2000, it has been possible to purchase parking permits over the internet. This service was expanded to allow the payment of citations in the same manner. These are examples of improvements in services that are common
among universities in recent times.

The Parking Office does not use parking management software that acquires and reports a wide variety of parking management data, as is state-of-the-art in universities at present. Not every vehicle used on campus by a member of the campus community is registered – only those vehicles used by individuals who want to purchase parking permits. The registration process does not capture data such as the primary work or class location of the individual, so that assessing the parking demand in various areas of campus may be done. Multiple permits are sold to individuals, but the details of these permits are not captured.

New Mexico State University has no parking and transportation principles – an expression of the role of parking and transportation on campus, goals toward which the programs are moving, and responsibilities of the members of the campus community. While a set of Parking Regulations exist, they are primarily examples of “thou shalt not” rules (e.g., don’t park on the grass, on the sidewalk, etc.) governing where and how individuals may park on campus. They are not principles as they are exhibited by campuses with a more mature program and approach to parking and transportation.

The Parking Office is required to be financially self-sufficient, paying for the expenses from the dollars generated through the services provided. When excess revenue results, it is used to improve parking areas, as described on the Office’s website. However, with parking permits at the cost levels illustrated, it is difficult to generate sufficient excess revenue due to basic maintenance to make substantial improvements.

**Parking Issues - Organizational Structure**

The Parking Office is part of the Police Department, a condition much less common than it once was on university campuses. The primary difficulty with this structure is that Police are naturally focused on public safety issues, as they should be, and parking has not always received the attention or resources that it needed. In previous years, when land was plentiful and parking improvements were inexpensive, it was not as important to manage the land and financial resources as it is becoming today. The Police Department has for some time wanted more participation in land use and facility discussions, in order to better plan for the operations (both parking and safety) to support these facilities and their activities. Those who have managed parking have not received training from either the International Parking Institute or the National Parking Association in parking management. Neither had they, until recently, attended any of the conferences and workshops designed to share information about state-of-the-art practices and issues at universities. While quite experienced in parking at NMSU, they have not had the opportunity to gain insights from the

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<table>
<thead>
<tr>
<th>Permit Type</th>
<th>Annual Cost</th>
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<tbody>
<tr>
<td>Commuter Student</td>
<td>$40.00</td>
</tr>
<tr>
<td>Resident Student</td>
<td>$40.00</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>$40.00</td>
</tr>
<tr>
<td>Outer Lot Employee</td>
<td>$40.00</td>
</tr>
<tr>
<td>Faculty/Staff</td>
<td>$75.00</td>
</tr>
<tr>
<td>Special Permit</td>
<td>$140.00</td>
</tr>
<tr>
<td>Visitor</td>
<td>$120.00</td>
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</table>

**Table P2: Parking Permit Prices**

<table>
<thead>
<tr>
<th>Option</th>
<th>What It Allows</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evenings (after 4:30 pm)</td>
<td>No permit required to park in visitor, commuter student, faculty/staff or meter spaces</td>
<td>FREE</td>
</tr>
<tr>
<td>Weekends (Saturday &amp; Sunday)</td>
<td>No permit required to park in visitor, commuter student, faculty/staff, or meter spaces</td>
<td>FREE</td>
</tr>
<tr>
<td>Daily E-Permit</td>
<td>Parking in visitor, student, or faculty/staff spaces</td>
<td>FREE - but only good for one day per permit, limit 5 permits per year.</td>
</tr>
<tr>
<td>Weekly Visitor Permit</td>
<td>Parking in visitor, student, or faculty/staff spaces</td>
<td>FREE - but must be renewed each week</td>
</tr>
<tr>
<td>Parking meter</td>
<td>Parking at specific meter</td>
<td>60 cents per hour</td>
</tr>
<tr>
<td>Outer-lot Annual Visitor Permit</td>
<td>Parking in any “All Permit” lot</td>
<td>$40 per year</td>
</tr>
<tr>
<td>All Access Annual Visitor Permit</td>
<td>Parking in visitor, student, or faculty/staff spaces</td>
<td>$120 per year</td>
</tr>
<tr>
<td>No Permit Required</td>
<td>Parking in any “Free” lot</td>
<td>FREE</td>
</tr>
</tbody>
</table>

**Table P3: Visitor Parking Permit Costs**

| Source: New Mexico State University |
experiences of other universities – many of which have years ago faced the issues now facing NMSU. Many access management activities on campuses (university, medical, or business) at present require expertise in campus planning, public relations and information, information technology, equipment technology, database analysis, finance, and strategic planning. The focus of balancing parking and transportation is no longer on enforcement, where it often started in Police departments. This is one of the major reasons that many campuses have moved parking activities into separate departments, combined them with transportation and other access management functions, and given them the tools to plan and manage these important infrastructure supports to the campus.

Parking Lot Conditions
The physical condition of the parking lots on campus varies widely. Some lots have been paved and striped recently, while others on the eastern end of campus remain as wind-swept, dirt parking fields. Without pavement or striping, these parking areas are only utilized for special events such as football games or an event at the Pan-Am Center. However, one of the student complaints voiced during meetings on campus was the condition and repair of the parking lots. There is seldom sufficient excess revenue to make all of the desired improvements to the facilities. Lighting in all the lots generally consists of roadway style lampposts that diffuse light over a broad area and do not provide adequate light for pedestrian movement or safety.

Lack of Access Control
None of the parking facilities is gated, with access gained by the use of access cards. This means that every facility must be patrolled in order to assure that only those who should park there are parking there. This requires a considerable staff to cover the large number of lots and geographic areas of the NMSU campus. Resources must be dedicated to trying to have sufficient officers patrolling, rather than using funds to control parking behavior through the use of gates and an automated system.

Last year there were approximately 14,000 parking tickets written on campus. This averages to about 92 per day of the academic calendar – quite a low number compared to

<table>
<thead>
<tr>
<th>2005-2006</th>
<th>Population</th>
<th>Permits</th>
<th>Estimated Driving Ratio</th>
<th>Estimated Presence Factor</th>
<th>Parking Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees</td>
<td>4,457</td>
<td>3,370</td>
<td>95%</td>
<td>90%</td>
<td>4,070</td>
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<tr>
<td>Faculty</td>
<td>1,051</td>
<td></td>
<td>95%</td>
<td>98%</td>
<td>899</td>
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<tr>
<td>Staff</td>
<td>3,406</td>
<td></td>
<td></td>
<td></td>
<td>3,171</td>
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<tr>
<td>Students</td>
<td>16,072</td>
<td>8,929</td>
<td></td>
<td></td>
<td>8,863</td>
</tr>
<tr>
<td>Resident [1]</td>
<td>2,329</td>
<td>1,991</td>
<td>85%</td>
<td>100%</td>
<td>1,991</td>
</tr>
<tr>
<td>Commuter</td>
<td>13,743</td>
<td>6,938</td>
<td>100%</td>
<td>50%</td>
<td>6,872</td>
</tr>
<tr>
<td>Other [2]</td>
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<td>823</td>
<td>100%</td>
<td>90%</td>
<td>741</td>
</tr>
<tr>
<td>Commercial Vendor</td>
<td>437</td>
<td></td>
<td></td>
<td></td>
<td>219</td>
</tr>
<tr>
<td>Total</td>
<td>20,529</td>
<td>13,122</td>
<td></td>
<td></td>
<td>13,673</td>
</tr>
</tbody>
</table>

[1] Including Family Student Housing
[2] Other permits issued; does not include all visitors.
Pedestrian / Vehicular Conflicts
other universities of similar size and number of parking spaces, even with access control on part of the facilities. Nearly half of these tickets were for the violation of “Current NMSU Parking Permit Not Displayed”, with other substantial portions of the tickets being written for “Parked in the Wrong Zone” and “Unauthorized Parking”. Thus a substantial number of individuals are not purchasing permits, are parking in areas where they should not be, or are visitors parking where they should not be – or a combination of all of the previous.

Nature and Cost of Permits
The permit structure at NMSU does not promote the maximum use of spaces, nor does it make many distinctions regarding service levels. Commuter students, who are by and large parking considerable distances from their destinations, pay the same annual cost as resident students who are parking close to their residences. Outer lot permits cost the same for employees as the permits do for students. While reserved spaces cost more, all faculty staff spaces are the same cost regardless of location. The same is true for Orange lots where all permits are valid. While most campuses make some distinction in price based upon convenience of the parking facility, this is not true at NMSU.

Large unpaved lots hold thousands of vehicles when special events generate the need to use them

The ability to purchase multiple permits allows potential abuse of the system. Unless enforcement is very strict, it is difficult to know whether two permits are on campus at the same time, in violation of the regulations.

Vehicular/Pedestrian Conflicts
There are a number of areas on campus that experience vehicular/pedestrian conflicts. In general they may be characterized as the following types:
- pedestrian ways that also allow vehicular access, so that pedestrians must walk in and among vehicles;
- entrances/exits from parking facilities where no sidewalks exist, and pedestrians must walk in vehicular lanes; and
- pedestrian crossing areas without markings, curbs, or other measures to separate vehicles from pedestrians.

There are a few, important areas on campus where vehicular-pedestrian conflicts occur. Some of the most severe conflict locations are located on Espina Street, between Stewart Street and University Avenue, where heavy pedestrian flows cross this four-lane roadway. While crosswalks are well-marked here, they are not signalized, so that the considerable amounts of pedestrian and vehicular traffic are often at odds with one another. Pedestrians walking from the parking lot do not have well defined paths and crosswalks.

Most of the vehicular-pedestrian conflict points occur on or adjacent to Frenger and International Malls. One of the biggest concerns regarding this issue is service vehicles using both malls as a short-cut between both ends of campus. It is understood that some of the buildings along the malls have no service access from any other street, and so some service vehicle usage is to be expected. Using these pedestrian walkways for service vehicle traffic dramatically curtails their attractiveness and pedestrian friendly nature.

Another point of conflict is where Williams Avenue meets Frenger Mall. Here, the shuttle buses use Williams Avenue to access Frenger Mall where they stop at the food court. Additionally, parking lot #49 is located at this corner, allowing private vehicles to access the heavily used pedestrian mall right-of-way. There are no gates and no signs to indicate to drivers that the mall is not a roadway, and the

This photo illustrates a typical paved parking lot on the NMSU campus. The lights, which are really designed for street light use, generally illuminate the lot but do not provide good lighting for pedestrian movements to and from the lot.
Parking meters are located on campus in parking lots and along streets where visitor parking is needed.

Permits change shape from year to year, making it easier to identify whether the permit is valid for the year.

Special Permits are the most expensive, and generally allow the holder to park in the most desirable spaces on campus.
Transportation Services - Public Transportation
Public transportation in the City of Las Cruces is operated by RoadRUNNER Transit, a city service. Two public transit bus routes currently connect to the NMSU campus. Route Two serves the western end of campus via Solano Drive and Espina Streets and University Avenue. Route Three connects with Route Two at Solano Drive and University Avenue and runs northwest to the Mesilla Valley Mall and terminates at the Mountain View Hospital.

On weekdays, Routes Two and Three operate from 6:30 a.m. to 7:20 p.m. and 7:40 p.m., respectively. On weekends, Route Two operates from 9:10 a.m. to 6:00 p.m. while Route Three runs from 9:30 a.m. until 6:00 p.m. Both routes run with 40-minute headways.

Campus Shuttle
RoadRUNNER Transit is also responsible for the operation of the Aggie Shuttle, which runs entirely within campus to connect the various academic and research areas of campus with the student housing on the south side of Stewart Street. The Aggie Shuttle only runs on weekdays, from 7:00 a.m. to 7:00 p.m. with 20-minute headways. This shuttle route is funded by the Associated Students of NMSU (ASNMSU). A second campus shuttle service was operated during the 2005-2006 school year to provide increased service to peripheral parking lots on the eastern end of campus. This shuttle service was funded by fees assessed to the ongoing campus construction projects that temporarily or permanently displaced part of the parking supply.

Pedestrian Access
Pedestrian access on campus is very good in some locations and is in real need of improvement in other areas. The general types of conditions needing improvement include:
• pedestrian ways that are blocked or otherwise ended without suitable alternative paths for pedestrians;
• lack of sidewalks; and
• areas of conflict with vehicles (covered previously).
In numerous locations, pedestrian pathways lead to dead ends or to service equipment that has been located without consideration for pedestrians. In other locations, pedestrian

Figure B: Las Cruces Roadrunner Transit Route 2
Figure C: Las Cruces Roadrunner Transit Route 3
Figure D: Aggie Shuttle
Legend
- Roads
- Existing Bicycle Lane
- Existing "Share the Road" Facility
- Multi-use Path
- Proposed Bicycle Lane
- Proposed "Share the Road" Facility
Some buildings require service vehicles to use the mall for access. Vehicles traveling on pedestrian walkways do not reinforce the idea of these areas as places where people can walk unhurriedly or without checking for personal safety.

Bicycle Access
The existing bicycle access to and within the university is varied and inconsistent. Along University Avenue, there is an existing bicycle path that is separated from the busy roadway by a pedestrian sidewalk. The bicycle path is paved with deteriorating asphalt and the direction of traffic is marked with arrows on the ground, which are now fading and hard to read. Because the sidewalk is immediately adjacent to the busy, high-speed University Avenue, pedestrians feel safer walking on the bicycle path. Ultimately, the environment of University Avenue and the condition of the bike path both contribute to its status as an underutilized bicycle facility.

On campus there are bicycle lanes on portions of Stewart and Wells streets. Unlike the bicycle path along University Avenue, these are separate lanes for bicycle traffic within the vehicular roadway. In many cases these bike lanes are in better condition than the path along University Avenue because they are maintained with the same consistency as the roadway of which they are a part.

As the figure below illustrates, the existing network of bicycle facilities adequately connects to campus on the north, but does not thoroughly extend within the university. This situation may be due, in part, to the fact that the university allows bicycles to be ridden on all campus sidewalks, thus reducing the need for separate bicycle facilities.

One of the undesirable outcomes of allowing bicycles to be ridden on sidewalks is that conflict between pedestrians and bicycle traffic. Walking from building to building on campus becomes less enjoyable, and potentially dangerous, for the pedestrian when one must dodge bicycles traveling at much higher speeds than the average pedestrian. Many campuses have found that requiring bicycles to be walked while on campus sidewalks contributes to a pedestrian friendly atmosphere and reduces potential accidents between bicyclists and pedestrians.

The current policy does require riders to walk their bicycle across roadway intersections. Some intersections, specifically along University Avenue, have signs instructing riders to dismount as they approach a crosswalk.

The intersection of Frenger Mall and Williams Avenue looks more like a regular street intersection than a heavily utilized pedestrian zone near the heart of campus. Crosswalks are not marked, and the size of the intersection allows a variety of vehicular movements that do not take pedestrians into account.
A lack of signs or restricted-access to the Mall can easily confuse drivers.

The placement of this dumpster unit is directly in the pedestrian walkway to the parking lot, as is one of the parking spaces.

Parking spaces placed without regard to pedestrian pathways make walking to parking lots both cumbersome and unsafe.

Exiting from the Interstate to University Avenue provides only this "trailblazing" sign leading to the University, with minimal information.

There are no sidewalks leading into this faculty/staff lot, so pedestrians must walk in the driveways.
Once bicyclists on campus arrive at their destinations, they find different levels of convenience when trying to park and secure their bicycles. At some buildings, bike racks are immediately outside the entrance and are well maintained and secure, while at others there are no bike racks nearby. In other locations, the bike racks are so old and dilapidated that bicycles can no longer be locked to them and bicycles must be secured to sign posts and railings. This situation is unattractive not only because it inconveniences those people who ride their bicycles and help to alleviate the university’s traffic and parking demand, but also because it increases the amount of upkeep and maintenance required for such improvised bike racks. Existing bike racks could also benefit from improved maintenance such as removing abandoned bicycles (or parts thereof) and sweeping out leaves and other debris deposited by the wind.

**Wayfinding**

Wayfinding on campus is important for visitors as well as for new students and employees who are not familiar with the campus. If one is a member of the campus community, finding the location of buildings and activities inevitably occurs over time. However, this process can be made simpler and more welcoming for new faculty, staff, or students. If one is a visitor to NMSU, the wayfinding is part of the initial impression of the university, and it facilitates or hinders accomplishing what was desired by coming to campus. The old adage of never getting a “second chance to make a first impression” also holds true for universities.

Starting at the interstate highways, where signs are not controlled by the University but might be influenced by it, information leading to and announcing the NMSU campus is sparse. There are few signs that let a driver know that the University campus is imminent. After exiting the interstates, the lack of significant signs announcing the University continues, except for the University’s own sign, and there are virtually no signs that direct a visitor to appropriate parking. While a visitor pass may be obtained at the Police Department/Parking Office, no signs direct drivers to this location. Visitor passes may be obtained on-line, which is a very convenient service for visitors, but unless one went on-line to discover this service, it would be easy to arrive at campus without knowing anything about visitor parking.

Other signs on campus may provide too much information for drivers. Signs such as the one shown below, located on a driveway into campus from University Avenue, are virtually unreadable for a driver traveling in a moving vehicle. There are too many messages to be read in the time available, and the sign itself is in need of repair for clarity. The sign also provides no information as to whether visitor parking (for the museum or art gallery listed) is available. The campus does not have a coordinated wayfinding program including signs and directions for visitors who are driving on campus or who are walking on campus. If a visitor finally locates a parking meter or obtains a parking pass and parks, there is no series of signs guiding a person to major buildings, special event venues, or other locations. These signs guiding pedestrians would also be very useful for those who are new to campus, vendors, conference participants, and others. In addition, a coordinated wayfinding, public information, and website program helps to “brand” the university in the eyes of visitors obtaining information or visiting the campus.

**The bicycle path along University Avenue is not well marked and utilized more by pedestrians than by bicycles**

**Pedestrians walking to this shuttle lot on the east end of campus must walk into the lot where both buses and personal vehicles are driving**

**This sign indicates that the parking is for visitors, it is very basic and does not reinforce that one is on a major campus, nor even which Dean’s office is referenced**
EXISTING STEAM AND CHILLED WATER DISTRIBUTION

LEGEND
ST = STEAM
CH = CHILLED WATER

- EXISTING UTILITY TUNNELS
- EXISTING DIRECT BURIED UTILITIES

NOTE: 1. ALL PIPE SIZES ARE IN INCHES
2. ALL STEAM MAINS ARE 12" DIA.
3. ALL CONDENSATE MAINS ARE 4" UNLESS OTHERWISE NOTED. ALL CONDENSATE EAST OF THE CENTRAL PLANT IS GRAVITY BACK TO THE PLANT.
4. ALL CHILLED WATER MAINS ARE 12" SUPPLY AND RETURN UNLESS OTHERWISE NOTED.

Existing Steam and Chilled Water Distribution Plan
Utilities Infrastructure - Steam and Chilled Water

Steam and Chilled Water for the campus are produced at a single central plant located near the center of campus. Steam is utilized to produce chilled water utilizing steam absorption chiller, heating hot water and domestic hot water. Chilled water is utilized for space cooling.

Steam is produced from natural gas fired boilers or is produced from waste heat given off in the exhaust of natural gas fired turbine generator cogeneration system. The campus steam load for heating and domestic hot usage is estimated to be 66,000 lbs/hr. Table H-1 summarizes the steam production capacity of the central plant.

Chilled water is produced utilizing steam (produced by natural gas fired boilers or the waste heat from the cogeneration turbine) in absorption chillers or electric driven chillers. The peak chilled water load for the NMSU campus is 4500 tons. Table H-2 summarizes the chilled water production equipment utilized in the central plant.

The chilled water system was designed to take advantage of prime utility rate options, utilizing natural gas, peak electricity rates or off peak electrical rates. Peak electrical rates are $0.09/KW and off peak rates are $0.035/KW. To take advantage of the off peak rates NMSU utilizes a 3,000,000 gallon chilled pool located under the central plant parking lot.

The central plant systems at NMSU, as originally established, were and are above average. However, as electrical rates and natural gas rates escalate due to inflation and current global energy market conditions, NMSU is subject to a significant energy budget crunch. To offset the increase in energy costs NMSU should initiate an energy conservation program. To implement this program will require a significant investment in Direct Digital Control (DDC) or Building Automation System (BAS) technologies. The reason, only about 25% of the campus buildings are DDC controlled thru a BAS.

This scenario of limited building control with such a robust central plant is analogous to a person with a strong heart and lungs, but lacking a brain and central nervous system to optimize their performance. DDC controls, if fully implemented could reduce energy consumption on the campus by as much as 10-25%. A BAS and direct digital control system could be utilized to implement the following energy saving operations:

- Night setback
- Optimum start/ stop
- Morning warm up
- Lighting control
- Outside air optimization
- Supply air reset

Table H1 - Steam Production Capacity

<table>
<thead>
<tr>
<th>Unit</th>
<th>Capacity (lbs)</th>
<th>Capacity (bhp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler #1</td>
<td>44,000</td>
<td>1,300</td>
</tr>
<tr>
<td>Boiler #2</td>
<td>44,000</td>
<td>1,300</td>
</tr>
<tr>
<td>Boiler #3</td>
<td>44,000</td>
<td>1,300</td>
</tr>
<tr>
<td>Steam Turbine</td>
<td>22,000</td>
<td>625</td>
</tr>
</tbody>
</table>

Table H2 – Chilled Water Production Equipment

<table>
<thead>
<tr>
<th>Chiller No.</th>
<th>Type</th>
<th>Capacity (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electric</td>
<td>1500</td>
</tr>
<tr>
<td>2</td>
<td>Electric</td>
<td>1500</td>
</tr>
<tr>
<td>3</td>
<td>Electric</td>
<td>1500</td>
</tr>
<tr>
<td>4</td>
<td>Steam Absorber</td>
<td>1200(1)</td>
</tr>
<tr>
<td>5</td>
<td>Steam Absorber</td>
<td>1200(1)</td>
</tr>
</tbody>
</table>

(1) The steam absorption chillers are supposed to produce 1500 tons of chilled water. Due to equipment problems their efficiency has dropped by 20-25%.
Existing Electrical Distribution Plan
In addition to saving energy resources, a properly implemented DDC system can reduce maintenance costs and staffing requirements. Energy conservation can also be implemented at the central plant level. Conservation concepts to be studied are as follows:

- Utilizing a closed loop fluid cooler to reduce the chilled water load. (See concept on next page)
- Convert the turbine to jet fuel capable and purchase surplus fuel from the local air force base.
- Reset chilled water supply temperature to 45°F. This scenario would make more efficient use of the chilled pool (maintained at current 41°F temperature). The 45°F chilled water supply temperature is appropriate for hot dry climate such as NMSU.
- Maximize the chilled water temperature difference across the leaving water temperature and the return water temperature.

Based on the above strategies, the Master Plan Team believes energy consumption can be reduced by 15-30% on the NMSU campus. Electrical service is provided to the New Mexico State University (NMSU) campus from two El Paso Electric company (EPCO) 5 Kilo-volt (KV) service points. The two EPCO service points are totalized into one meter. The estimated peak demand and minimum power factor is provided by NMSU. Table E1 summarizes the NMSU campus electrical data.

The two EPCO service points are located at the Tortugas Substation and the Geo-Thermal Substation.

**Geo-Thermal Substation**

The Geo-Thermal Substation consists of one 25KV feeder. This feeder serves the areas to the east of the campus triangle including the golf course and some buildings on the east portion within the campus triangle. The feeder capacity is 4.78 Mega-watts (MW). The estimated peak load on the Geo-Thermal feeder is 400 KW.

**Tortugas Substation**

The Tortugas Substation consists of six 25 KV feeders which serve the majority of the NMSU campus triangle and includes the Dona Ana Community College. The electrical distribution within the campus triangle is a hybrid of the 25KV distribution and the 5KV distribution. The electrical distribution is configured with a switching arrangement that enables sections of circuits to be shifted from one circuit to another through manual switches. The six feeders from the Tortugas Substation are summarized in Table E2 below:

The 5 KV distribution originates at the central plant. The central plant contains the 5 KV Cool Pool Substation. The 5 KV Cool Pool Substation consists of two distribution switchgear. The two switchgear distributions are termed non-essential switchgear and essential switchgear.

The non-essential switchgear is served from two 25 KV Tortugas Substation feeders via two 2500 KVA, 5 KV secondary transformers. The non-essential switchgear serves the central utility plant and other selected building loads.

### Table E1 – Electrical Load Data Summary:

<table>
<thead>
<tr>
<th>Electrical Load Data Summary</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Square Footage of Buildings on Campus</td>
<td>5,241,000</td>
</tr>
<tr>
<td>Estimated Peak Real Power</td>
<td>16 MW</td>
</tr>
<tr>
<td>Estimated Minimum Power Factor</td>
<td>0.88</td>
</tr>
<tr>
<td>Estimated Apparent Power (KVA)</td>
<td>18 MVA</td>
</tr>
<tr>
<td>Campus Load Density (VA/Sq.Ft)</td>
<td>3.43</td>
</tr>
</tbody>
</table>

### Table E2 – Tortugas Substation Feeder Summary:

<table>
<thead>
<tr>
<th>Tortugas Substation Feeders</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeder No.</td>
<td>Serves</td>
</tr>
<tr>
<td>1</td>
<td>Buildings located on the Southwest section of campus triangle (Student housing area)</td>
</tr>
<tr>
<td>2</td>
<td>Buildings located on the southeast section of campus triangle</td>
</tr>
<tr>
<td>3</td>
<td>Central utility plant and buildings located in the center of campus (Cool Pool Substation – Non-essential Switchgear)</td>
</tr>
<tr>
<td>4</td>
<td>Central utility plant and buildings located in the center of campus (Cool Pool Substation – Essential Switchgear)</td>
</tr>
<tr>
<td>5</td>
<td>Buildings located on the northeast section of the campus triangle</td>
</tr>
</tbody>
</table>
The essential switchgear is served from two 25 KV Tortugas Substation feeders via two 2500 KVA, 5 KV secondary transformers and one 5 MW natural-gas driven turbine. The turbine has approximately 4.8 MW of capacity and is determined by the natural-gas turbine is paralleled to the El Paso Electric Company grid. When the turbine is running, approximately 1.2 MW of power is exported to El Paso Electric.

New Mexico State University has expressed the desire to transition all of the existing 5 KV distribution to a 25 KV distribution system. All new services should be connected to the 25 KV distribution. Consideration should be given when permissible to remove existing load from the 5 KV distribution and transfer the load to the 25 KV distribution.

Emergency power for egress and exit lighting is derived from a single 480Y/277V, 3 phase, 4 wire generator installed in a weatherproof enclosure adjacent to the central utility plant for selected buildings. Emergency power for the remaining buildings where required is provided from emergency fluorescent ballasts or emergency wall packs for egress and exit lighting.

**Potable Water System**

The current potable water supply system is configured as pictured in Figure W-1. The system is fed by three wells located along I-10 on the west side of campus that supply a 4 million gallon storage tank located on the east side of I-25 near the University Golf Course. Throughout the life of the University, wells have been sited in various locations throughout campus and it has been determined that the current well field location (aquifer) provides the highest quality water for domestic consumption. Other well locations have produced water with high levels of dissolved solids and other contaminants.

Under the current configuration, the water system is looped. Pumping at the wells is controlled by the level of water in the storage tank. When the water level falls below a given elevation, one of the wells will turn on. If the level of water continues to fall below a second given elevation, a second well will begin pumping. The third well is triggered by a
third, lower elevation. As the tank water level recovers, the wells are shut off one by one in the reverse order of their turning on. Because the pipe system is looped within itself, a demand in the line may be fed by water from the east campus storage tank or directly from the pumping well. Once the demand is met, any excess flow from the pumping well will flow up into the water storage tank.

The groundwater is treated with chlorine (for disinfection) and sequestering agent (for aesthetics) at each well before it is fed into the distribution system. The sequestering agent prevents iron and manganese from reacting with oxygen in the groundwater to control precipitation. Since water can currently feed directly from the well to the point of demand, water must meet drinking water quality regulations at the wellhead. The current system layout, therefore, requires multiple wellhead treatment and monitoring locations.

The University is currently undergoing a reconfiguration of the water supply system so that all water withdrawn at the wells will flow directly through a dedicated transmission pipeline to the storage tank on the east campus. From the tank location, the water will then gravity feed back down to meet demands on the west side of I-25. A new 5 million gallon storage tank is being constructed just south of the existing 4 million gallon tank. Once this effort is complete the University will determine whether or not the current 4 million gallon tank is salvageable for use. If it is, this tank will continue to be used in combination with the new 5 million gallon tank. If the 4 million gallon tank is determined to be unsalvageable, the 5 million gallon tank will be the sole storage tank in the system. Figure E-1 shows the layout of the new system with the three wells feeding into a 14 inch transmission line, which flows to the east campus tank locations. The water exits the tanks through a 24 inch pipe which supplies a 14 inch pipe. Both the 24 and 14 inch pipes cross I-25 and tie into the on campus distribution system. This new configuration will help to stabilize pressures in the system and will allow the University to eventually move their water treatment activities to one central location at the tank instead of addressing it at the wellhead. Though centralized treatment is not planned for the near future, this ability may become more important as the University will determine whether or not the current 4 million gallon tank is salvageable for use. If it is, this tank will continue to be used in combination with the new 5 million gallon tank. Once this effort is complete the University will determine whether or not the current 4 million gallon tank is salvageable for use. If it is, this tank will continue to be used in combination with the new 5 million gallon tank. If the 4 million gallon tank is determined to be unsalvageable, the 5 million gallon tank will be the sole storage tank in the system. Figure E-1 shows the layout of the new system with the three wells feeding into a 14 inch transmission line, which flows to the east campus tank locations. The water exits the tanks through a 24 inch pipe which supplies a 14 inch pipe. Both the 24 and 14 inch pipes cross I-25 and tie into the on campus distribution system. This new configuration will help to stabilize pressures in the system and will allow the University to eventually move their water treatment activities to one central location at the tank instead of addressing it at the wellhead. Though centralized treatment is not planned for the near future, this ability may become more important as...
concentrations could be elevated over what is healthy for the biological processes at the City wastewater treatment plant and for aquatic life in the Rio Grande. Due to this concern, some of the buildings on campus (Chemistry and Agricultural) have neutralization basins installed in or near them. These basins collect water from the buildings' laboratories and neutralize the pH of the water before releasing it into the wastewater collection system. There is one location (from one of the sorority houses) where wastewater from the University feeds directly into the City sewer system at University Avenue. The flow from this one building is minor, however, in comparison to those from the central monitoring location in the Knox Street sewer line and consists of domestic type wastewater only.

The City has been treating NMSU’s wastewater for over 20 years and there has been no indication that this arrangement would not continue in the future. Historically, the University’s projected growth has not been considered in the City’s wastewater master planning process. The City, however, is currently in the process of developing a new wastewater master plan and has indicated that they would be interested in getting forecast information from NMSU to include in this planning document.

The City of Las Cruces has asked the University to pursue a study to determine the amount of infiltration that enters the sewer system during large storm events and to develop solutions to address this issue. The University has already proposed elevating manhole covers on Stewart Street to be flush with the pavement (they are currently receded into the pavement). There is also consideration of installing anti-infiltration caps on these manhole covers. It is thought that much of the infiltration may be occurring at the northwest portion of campus which lies in the 100-year FEMA floodplain. During large storm events, the ground in this area will be saturated and infiltration rates may be large. Suggestions on how the University may address some of these concerns are included in the Future Conditions Section.

According to staff at NMSU - Engineering, the majority of west campus has adequate sewer capacity to serve the needs of the University. There is one location, however,
Natural Gas System

The University currently purchases its natural gas from the City of Las Cruces. Two natural gas pressure systems are located on the NMSU campus: high pressure, owned by the City of Las Cruces, which feeds into the cogeneration plant; and low pressure which is used for heating some of the buildings on campus. This section will address the low pressure natural gas system; the high pressure system is discussed elsewhere in this report.

Figure G-1 shows the layout of the natural gas systems. There are two low pressure regulation stations at the perimeter of campus where the University system is supplied by the City system. The main feed is through the regulator station located at the intersection of Espina Street and University Avenue; the secondary feed is near the western end of the proposed extension of Payne Street near Interstate 10. The majority of the low pressure gas is used for heating in the outlying buildings of campus. The majority of the buildings in the campus interior are heated with steam from the cogeneration facility.

At this time there are no concerns according to input from OFS staff with the layout or operation of the low pressure natural gas system. As new buildings are added their service will be a function of their affiliation (private versus University owned) and their location. All private buildings will be responsible to acquire their own natural gas service through the City. For example, the Arrowhead Research Park is currently served by a private contract with the City for natural gas service. Future University buildings that are constructed in the interior of the campus will be served that will become a bottleneck as development occurs on the east campus. The sanitary sewer from the east campus is currently fed through a pipe down Wells Street. This pipe is 8 inch in diameter until approximately Locust Street where it reduces to a 6 inch line. As development occurs on the east campus, the 6 inch line will not provide enough capacity for the anticipated flows, requiring the University to upgrade this section of pipe to 8 inches. Other than this location, the University has indicated that it is satisfied with its current sewer system.
Figure D-1
with steam heat from the cogeneration plant if the system's capacity allows. Buildings located in areas outside of the existing campus interior will be put on the low pressure natural gas system.

**Geothermal Water**

The University has two geothermal wells located east of the University Golf Course. The wells were used historically to draw geothermal 130OF to 140 OF water from a depth of approximately 700 feet. Geothermal water (brine) was run through a heat exchanger and then re-injected through a well in the Golf Course. Higher quality water was pumped from another source, run through the same heat exchanger, transmitted under I-25 to the west campus and stored in an underground storage tank for use as a heating source. The water, however, lost much of its heat during transmission and storage, requiring it to be reheated before it could be effectively used for heating purposes. Due to the inefficiency of the operation, the use of geothermal water was discontinued.

The University may consider using geothermal water for heating again as future development on the east campus occurs. Before the University pursues this option, it is recommended that a feasibility study be prepared to determine the efficiency of using the geothermal water source. This study should determine if the transport distances to the proposed development are short enough for the water's heat to be retained. The study should also address the water source to determine what the quality (temperature, total dissolved solids content, etc.) of the water is at various depths and how these factors may affect the necessary maintenance and operation of a geothermal system. If a system were to be pursued, at least two new wells would have to be drilled (one extraction one and one re-injection well). The wells that were formerly used are no longer operational and would need to be replaced. The recommended feasibility study should include a cost-benefit analysis for the entire operation.

There is currently research being done at the University to determine the success of using low quality water for irrigation purposes. Some of these studies are addressing the irrigation of turf with high TDS water. If these studies prove to be successful, the University also may consider using geothermal (low quality, high TDS) water for irrigation purposes at a new golf course that has been proposed for construction on the east campus.

**Storm Water Drainage System**

Large drainage basins that feed into the NMSU campus begin at the top of the Organ Mountains, flow through various developments, a dam, the east campus, under I-25, and finally into the west (main) campus. Figure D-1 shows drainage within the west campus including general flow patterns and major arroyos. There are four main arroyo systems that flow from east of I-25 through the campus: the Tortugas, Mission Bell, Cholla, and College Arroyos.

The Tortugas Arroyo is the largest of these arroyo systems. The Tortugas watershed originates high in the Organ Mountains and flows down into an Elephant Butte Irrigation District (EBID) dam structure located just east of the NMSU golf course. This structure was built to address the drainage needs of farmers in the Mesilla Valley and is, therefore, not adequately designed to protect downstream areas during major storm events. The 2006 City of Las Cruces Drainage Master Plan (CLC DMP) recommends additional storage upstream of the EBID dam as development continues in the City and at the University.

The 2006 CLC DMP, 1995 NMSU Main Campus Storm Drainage Master Plan (NMSU DMP), and OFS – Engineering staff have all indicated that there are numerous problem areas as drainage flows under I-25 and enters the west campus. The drainage structures that transmit water under the freeway at the Tortugas Arroyo, Mission Bell Arroyo, and Cholla Road appear to be adequate for this purpose. Once this flow encounters Triviz Street, however, there are problems with flooding during larger rain storms. There is no drainage infrastructure under Triviz at Tortugas and Mission Bell Arroyos and the concrete pipes that are installed under Triviz at Cholla are not large enough to handle major storm flows. Because of this, large amounts of water and debris flow over and collect on Triviz Street a few times each year making the street impassable and potentially dangerous. OFS – Engineering staff report that in 2005 a car was washed off of Triviz Road at the Mission Bell Arroyo crossing during a large storm.

There are also maintenance issues downstream of the main campus, where the arroyos flow under I-10. After every major rain event there are large amounts of debris that get into the drainage structures (culverts, box culverts, and bridges). Often times this can lead to flood waters backing up into NMSU property. The main concern, however, is the maintenance time that crews spend time cleaning out these structures. Though these structures are the responsibility of the New Mexico Department of Transportation (NMDOT) (because they are in their right of way), NMSU maintenance crews will often help to remove the debris from the structures in an effort to clear Sam Steel Way (the frontage road that runs along I-10). There is currently a proposal to rebuild the portion of I-10 that runs along the western boundary of the main NMSU campus. It is hoped that some of these drainage issues will be addressed when this construction occurs.

The College Arroyo flows under I-25 north of University Ave and empties into the campus through two 60” culverts near the Pan American Center. According to the 1995 NMSU DMP and OFS – Engineering staff there are problems along this arroyo where it intersects Stewart Street and again as it crosses Wells Street. The drainage structure at Stewart Street is not large enough to adequately convey large flows, causing the arroyo to back up and flow over the road during large storm events. When the arroyo meets Wells Street, there are no drainage structures to carry the water under the road resulting, again, in water flowing over and flooding the street during larger events.

Once water enters the west campus it flows (primarily) from east to west. Small drainage ponds are scattered throughout the campus, but the main drainage structures include the NMSU pond (an EBID structure) at the Arrowhead Research Park and a regional drainage pond located at the intersection of Stewart and Union Streets (see Figure D-1). The majority of the storm water from the developed portion of campus is conveyed via street flow to the drainage pond at
Stewart and Union. This drainage strategy leads to problems since most of the water created on campus is funneled toward Stewart Street which carries it to the regional pond. Because of this design, Stewart Street runs curb to curb with water during most rain storms and must be closed due to flooding a few times each year. Other areas on campus that experience drainage problems include Frenger Mall, which acts as a secondary conveyance of runoff from the east to west side of campus. The capacity of the Mall is not sufficient to carry all of the water during large storms and has overflowed into the areas bordering the Mall in the past. When the Mall overflows, some of the buildings situated along the mall have experienced problems with water collecting in their basements. Some of the buildings that have historically had problems with flooded basements include: Foster Hall, Walden Hall, the Pan Am Center, the Music Center, New Science, Garcia Annex, Breland Hall, Branson Hall, Hadley Hall, Jett Hall, and Thomas & Brown.

In the past, the University has addressed some of the surface drainage problems by installing drop inlets and conveying their storm water runoff through storm sewers. NMSU officials, however, have indicated that this approach is cost prohibitive for the drainage issues that they are currently facing within the main developed campus area. Officials have expressed a desire to leave the current drainage infrastructure as-is within the developed campus area. They feel that it is most convenient to block off and/or monitor the problem areas for the few hours that flooding occurs two or three times each year. As future development occurs, however, the University would like to see drainage issues addressed (and financed) as part of the project. In these cases, drainage infrastructure should be designed with a goal of no-net-increase or a net decrease in runoff.

Drainage problems have also been noted on the east campus near where pavement ends on Geothermal Road. A subdivision was constructed in this area without proper drainage controls being installed. Water flows from University property into the subdivision and causes flooding. The City has recently leased a piece of land from the University and installed a drainage pond in an attempt to alleviate this problem. At this time, it appears that the issue has been adequately addressed.