



KANSAS STATE

UNIVERSITY

NORTH CAMPUS CORRIDOR MASTER PLAN 2015



Office of the President

We completed the Campus Master Plan Update in 2013, and it has provided a strong road map to guide our future university growth. This plan focused primarily on the academic core of the campus, and as we considered the quickly developing opportunities for growth in the part of the campus to the north of the academic core, we recognized the need to pursue additional planning for the area we have designated as the North Campus Corridor. This area is bounded by Kimball Avenue, N. Manhattan Avenue, Claflin Road, and College Avenue.

In Spring 2014, we formed the North Campus Corridor Master Plan Task Force, which included representatives from Kansas State University, as well as individuals from the City of Manhattan, the Manhattan Area Chamber of Commerce, and the Institute for Commercialization. This collaborative group was asked to:

1. Review and integrate the existing master plans for the university and affiliated organizations, which border the North Campus Corridor.
2. Establish guidelines and modify unit plans to align with a cohesive plan for the North Campus Corridor.
3. Provide opportunities for stakeholder input into the design process.

The Final Report of the North Campus Corridor Master Plan reflects valuable input and feedback gathered from both campus and community members. It provides guidance on land use, building locations, streetscapes, parking and transportation, signage and wayfinding, and infrastructure. These plans will inform our collaborative work with the City of Manhattan to address the anticipated growth both at the university and in the community, especially with the upcoming construction and opening of the National Bio and Agro-defense Facility, which is included in the North Campus Corridor area. Thank you to all who have contributed to this plan. We are excited about the opportunities for our students, faculty, staff and community as we continue to pursue K-State 2025 goals.

A handwritten signature in black ink that reads "Kirk A. Schulz".

Kirk Schulz, President

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EXECUTIVE SUMMARY

"The North Campus Corridor will fuel economic growth and development with a wide area of impact for the region. Ultimately, it will advance us toward our goal of becoming a top 50 public research university by 2025."

- President Kirk Schulz

INTRODUCTION

The Kansas State University North Campus Corridor Master Plan provides a vision and a framework for how the area bounded by Kimball, College and North Manhattan Avenues and Claflin Road on the Manhattan campus can provide the facilities, open space, and infrastructure necessary for the university to achieve its visionary goal to be a top 50 public research university by 2025. It builds upon the 2012 Campus Master Plan and emerging opportunities that will come with the construction of the U.S. Department of Homeland Security's National Bio and Agro-Defense Facility (NBAF). The Master Plan identifies flexible development potential that will advance the goals of the strategic plan, improve the image and identity of KSU, and enhance the students, faculty, staff and visitor experiences of the campus in their daily activities.

COORDINATION WITH OTHER INITIATIVES

A series of more detailed, recent and on-going studies support the development of the North Campus Corridor Master Plan, including:

- KSU Foundation Business Park Master Plan
- Research Park Master Plan
- K-State Athletics Master Plan
- University Gardens Master Plan
- Campus Creek Design Studio
- Housing and Dining Services Master Plan
- Signage and Wayfinding Master Plan
- College of Agriculture Facility Planning
- College of Veterinary Medicine Master Plan

The City of Manhattan and Riley County improvement studies for Kimball, Denison and North Manhattan Avenues are also considered in the final planning strategies. Each of these studies contain findings and recommendations about the specific needs and preferred future of the physical campus that supplement the broad vision of the Master Plan.

PHASING AND IMPLEMENTATION

Implementation of the North Campus Corridor Master Plan will be realized incrementally through the successful funding and completion of individual

projects. The exact sequence, programming and design details of projects will naturally evolve along with the University's needs and priorities. The completion of NBAF construction - as well as its successful, ongoing programs - will provide one of the biggest incentives for defining future needs. Additional studies for Kimball Road improvements, stormwater management and other public realm enhancements will be informed by partnerships with the City and County. In the future, KSU envisions that the University administration, K-State Athletics, KSU Foundation, Campus Planning and Facilities Management, and a variety of campus advisory committees such as the Council on Parking Operations will use the North Campus Corridor Master Plan to guide the physical development of the campus.

QUALITY OF LIFE AND SENSE OF PLACE

The North Campus Corridor Master Plan recommendations stem directly from the aspiration to embody the University mission – to “foster excellent teaching, research, and service that develop a highly skilled and educated citizenry necessary to advance the well-being of Kansas, the nation, and the international community.” The Master Plan likewise “embraces diversity, encourages engagement, and is committed to the discovery of knowledge, the education of students, and improvement of the quality of life and standard of living of those we serve.”

Strategies to place buildings, strengthen open space and improve connectivity and circulation are intended to create a unique place-based University experience. The entire University and Manhattan community should be aware of - and benefit from - the sense of place and sense of program that manifests itself in this area of the campus. This includes the North Campus Corridor's rich heritage, and blend of multi-purpose environments designed for live, work, study, and play, all within a walkable distance to the historic campus core, Aggieville and downtown Manhattan.



Pedestrian view from Kimball and Denison looking West



Birds eye view from Kimball and Denison looking West

FACILITY ENHANCEMENTS

The primary goal is to provide facilities and infrastructure that meet the University’s evolving needs and are competitive with benchmark institutions. The North Campus Corridor Master Plan synthesizes and refines a variety of improvements to academic, research, campus life, and support facilities on campus that were identified in the 2012 Campus Master Plan. These have been informed by KSU efforts to recruit and retain the highest caliber faculty, staff, students, and partners from the region, the state and around the world. While the projects are not in any sequential order of development, they include short- and long-term planning, programming, design and construction underway.

New and improved facilities will also advance the University’s commitment to energy efficiency and sustainability and adhere to regulatory requirements. All proposed facilities are context sensitive, complement historic growth patterns, and frame streetscapes and public spaces. They also provide critical building use, massing, and identity to support the following:

- New interdisciplinary academic and research space located next to expanding departments and in close proximity to the campus core – between Claflin Road and Jardine Drive
- Organization of new square footage around planned projects – to shape open space and human-scaled environment
- New College of Veterinary Medicine facilities - to expand and integrate Equine, One Health, Small Animal Clinic and Coles Hall facilities while bridging to new partners in the Research Park
- New College of Agriculture facilities - to address existing and future space needs, adjacencies with existing support facilities, increased greenhouse capacity, and wayfinding to key visitor destinations



Proposed Building Use

- Existing Buildings
- Academic/ Research
- Research/University Partners
- Student Housing
- Student Life/ University Administration
- Office/ University Partners
- Facilities Services
- Athletics
- Recreation Services
- NBAF
- Parking Garages
- North Campus Corridor Boundary

OPEN SPACE AND PUBLIC REALM ENHANCEMENTS

The primary goal for open space improvements is to strengthen the North Campus Corridor identity and the KSU brand – both on the perimeter streets as well as the supporting network of green space. Complementary objectives are to provide active open spaces that are beautiful, comfortable, navigable, and contribute to the larger University identity. These assume that:

- Proposed open space adds to the unique landscape experiences available in the campus core
- New plazas and courtyard spaces provide outdoor gathering and learning landscapes
- Pedestrian malls proposed in 2012 are refined to reflect views, multi-purpose use and universal access
- Campus Creek is prominently displayed and utilized as the key KSU riparian corridor
- Open space typologies negotiate campus topography as development shifts to the higher land surrounding NBAF

A second key goal is to cultivate landscapes for learning, research, and recreation in proximity to buildings with related programs. Each of these open spaces has a critical role to play in expanding knowledge creation, welcoming visitors and distinguishing KSU from any other university in the region:

- Agricultural demonstration garden – a front door to the North Campus research fields and a reminder of the institutional heritage within view of athletic events
- University and Campus Creek gardens – the jewel of the North Campus Corridor and a showcase at the crossroads of Main and North Campus circulation
- Improved athletic fields and facilities – venues and activities that build a strong bond between current students, alumni and the community at large

A third goal of the open space strategies is to enhance natural systems and promote sustainable landscapes. Opportunities for improved stormwater management amenities and best practices are identified. Ideas from students, faculty and staff to vivify and celebrate the North Campus riparian corridors – especially Campus Creek – are integrated with recommended areas for landscape preservation and restoration.



Proposed Open Space

- Proposed Campus Building
- Multi-Purpose Open Space
- Wooded Preserve
- Agricultural Research Fields (Cultivated)
- Agricultural Research Fields (Rangeland)
- Display Area
- Athletics and Recreation Fields
- Stormwater Management
- Outdoor Gathering Space
- NBAF
- Primary Ag. Drainage
- Campus Creek Preserve
- North Campus Corridor Boundary



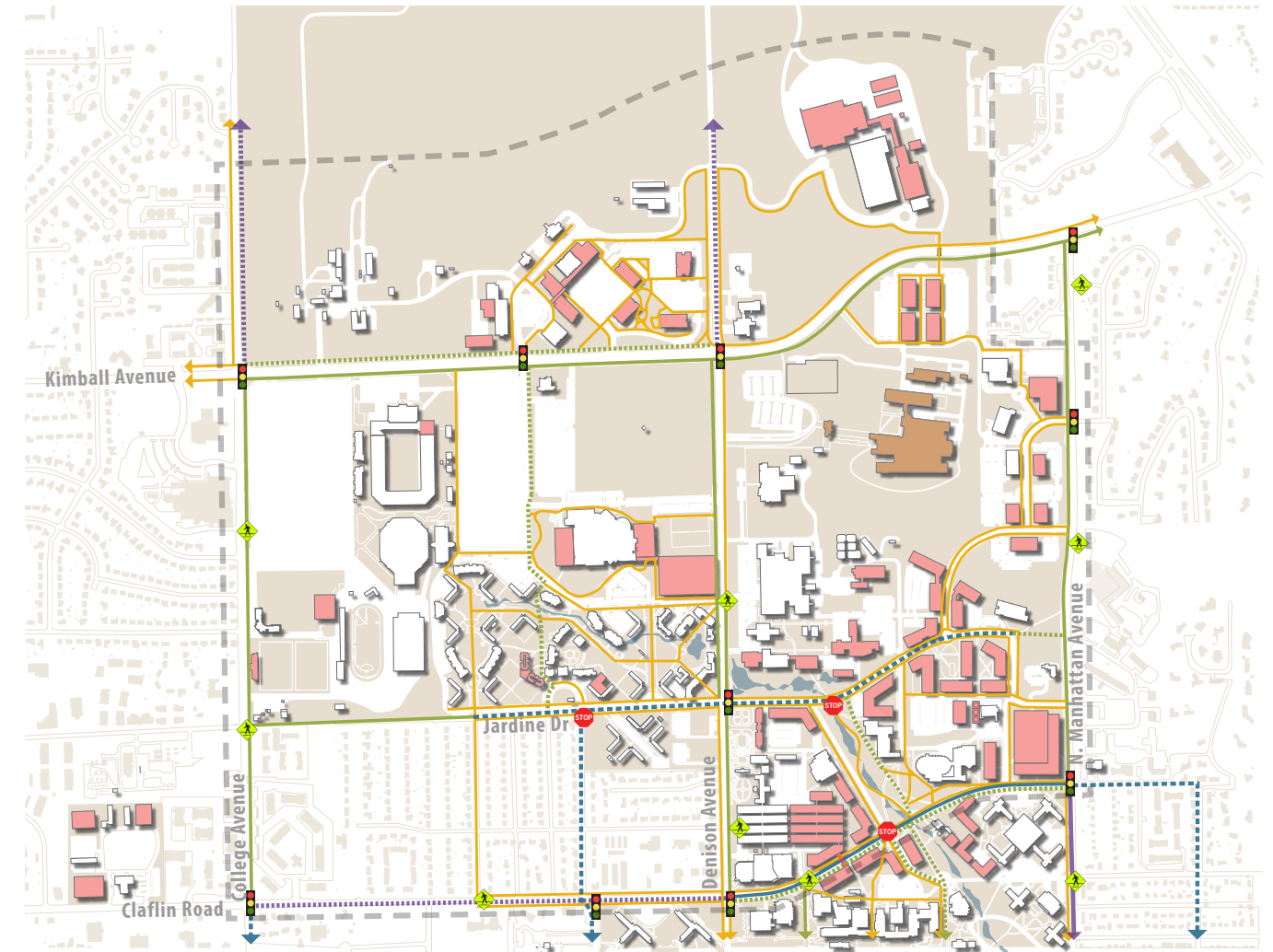
DESIGN GUIDELINES, SIGNAGE AND WAYFINDING

The North Campus Corridor Master Plan expands on the 2012 Campus Master Plan recommendations and provides more detailed direction for streetscapes, gateways, and signage for buildings and open space. Intended as a nesting “kit of parts”, together they promote campus brand, establish a clear public identity for KSU facilities and their aggregated districts, and aid in wayfinding for partners and visitors alike.

TRANSPORTATION AND PARKING ENHANCEMENTS

Both the 2012 Campus Master Plan and the North Campus Corridor Master Plan anticipate the development of new facilities on existing surface parking lots. Strategies to replace stalls as well as position the campus for any future parking needs are based on a campus-wide study. In coordination with an overall campus transit strategy and other multimodal transportation improvements, the following strategies are proposed:

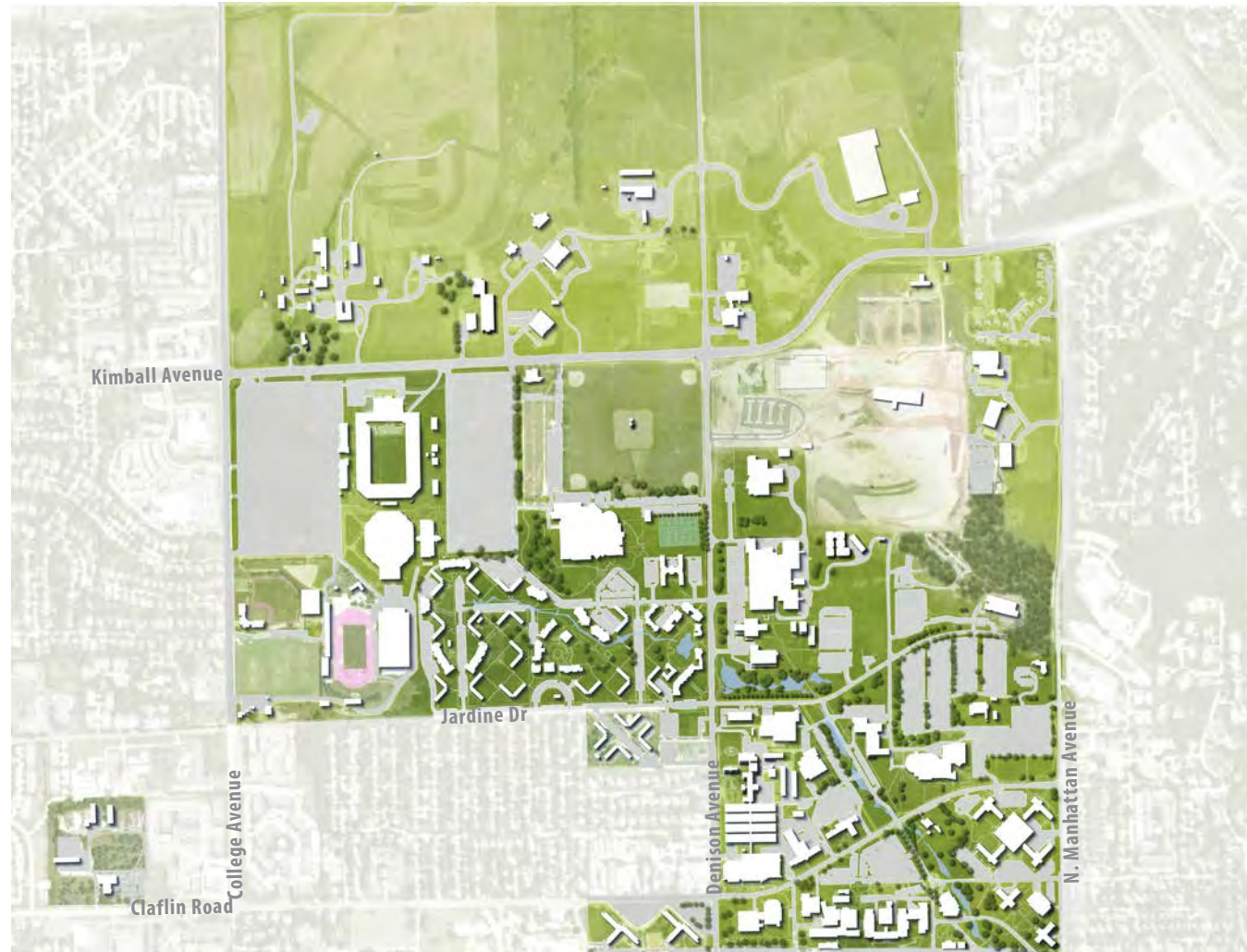
- Three proposed parking garages utilize sites that maximize convenience and minimize added stormwater run-off
- Strategic surface lots provide capacity for visitors and short-term parking
- Extended routes for pedestrian, bicycle, and transit connectivity link the core campus with northern circulation corridors and incorporate planned pedestrian malls at Mid-Campus Drive and 17th Street
- Proposed landscape treatments for major street corridors enforce campus identity and sense of place
- Changes in vehicle traffic based on proposed campus development projects are anticipated and integrated in a plan for both 24/7 movement and special events



Proposed Circulation

- Proposed Campus Building
- NBAF
- Pedestrian Routes
- Existing Shared Use Paths
- Proposed Shared Use Paths
- Existing Bike Boulevards
- Proposed Bike Boulevards
- Existing Bike Lanes
- Proposed Bike Lanes
- ▲ Crosswalks
- Traffic Signal
- STOP Multi-Way Stop
- North Campus Corridor Boundary





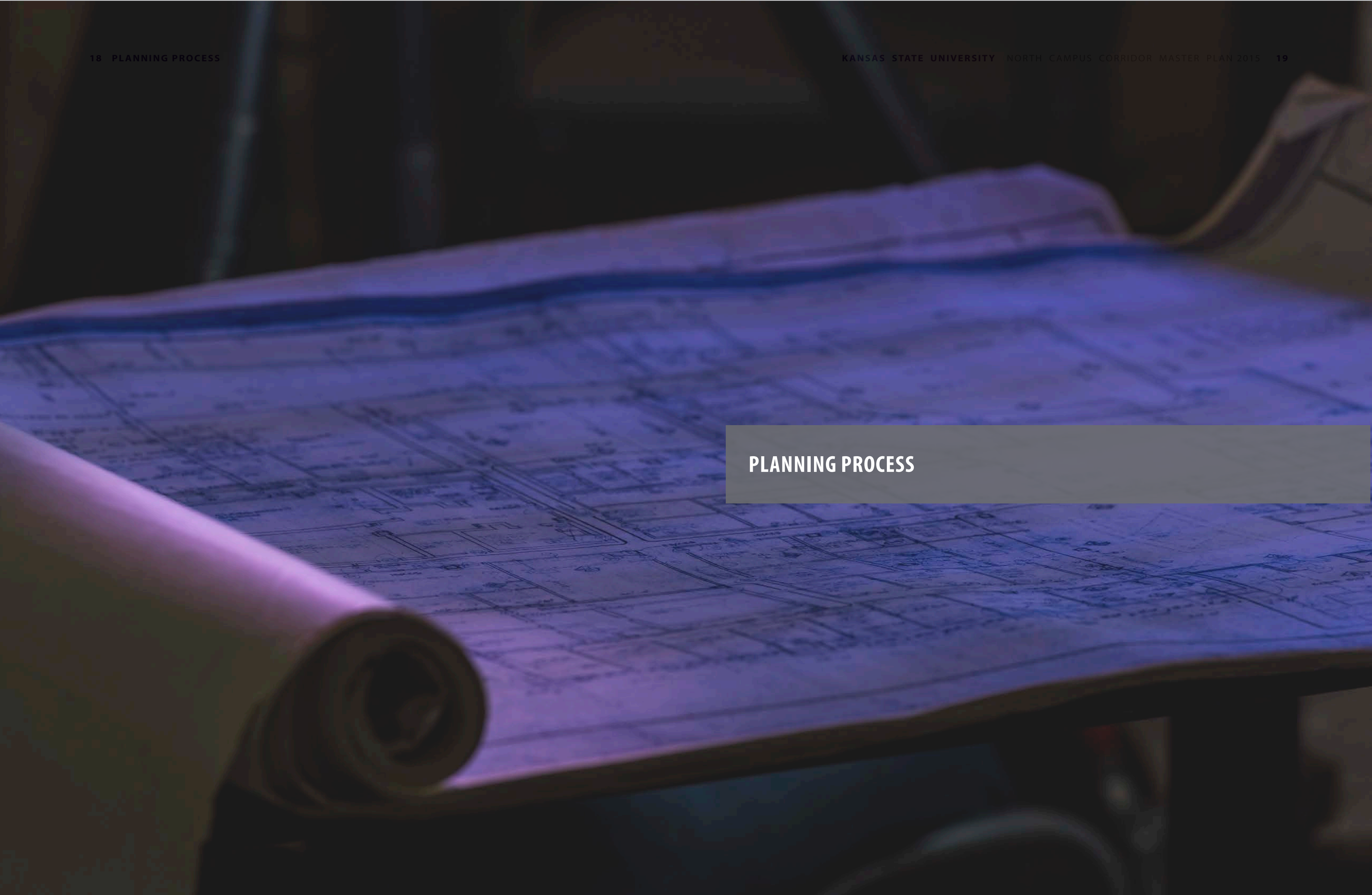
Existing Campus Master Plan



Proposed Campus Master Plan



- Proposed Campus Building
- NBAF
- North Campus Corridor Boundary



PLANNING PROCESS

Engagement

The North Campus Corridor Master Plan is the culmination of an effort to integrate a number of existing master plans that include or influence the campus area framed by Kimball, College, and North Manhattan Avenues and Claflin Road. Much of the plan relies on work completed in previous planning efforts - as well as the anticipated impacts of NBAF construction and operations. As a result, engagement strategies primarily involved working with stakeholders represented in each of the previous plans to review how their outcomes and recommendations were synthesized into an integrated development strategy for the North Campus Corridor.

Similar to the 2012 Campus Master Plan, this was achieved through the convening of a Task Force to support the planning process, and coordinated by a project leadership team. The North Campus Corridor Master Plan Task Force comprised a broad spectrum of university and community stakeholders. The Task Force met approximately once a month from November 2014 through May 2015 to envision a preferred future, perform a SWOT Analysis, provide evolving stakeholder information, review progress, and confirm goals, objectives, planning principles, development program, preferred strategies and phasing for future North Campus Corridor improvements. Its guidance was instrumental in developing a North Campus Corridor Master Plan that effectively addresses the needs of the University, City of Manhattan, and Riley County.

In addition to the work of the Task Force, specific stakeholder groups were identified. Dedicated focus groups and work sessions were conducted with these stakeholders to address their distinct concerns, review conceptual plans, and provide feedback on the final plan. University and community stakeholder groups were as follows:

- Research
- Academics
- Operations and Maintenance
- Parking and Transportation
- K-State Athletics, KSU Foundation, and Student Life

- Community Groups - including government and corporate entities

To achieve a broader perspective, a three-day charrette and multiple open houses were conducted to inform a wider citizenry of the master plan. These included two community-based sessions in the City Hall and two campus-based drop-in session in the Student Union.

Process

Discovery and Goals

Because a variety of previous studies served as the basis for the North Campus Corridor Master Plan, the planning process began with a deep assessment of previous and on-going strategic, academic, physical and capital planning efforts. This was completed to distill pertinent information, synthesize their results, and carry forward any goals that would inform the project and process. This effort was augmented by meetings with the Task Force, various stakeholder groups, and the public regarding goals and aspirations for the North Campus Corridor Master Plan. Extensive walking and driving tours were also conducted to understand the physical context and qualities of the campus and community context.

Taken together, these activities provided a thorough understanding of the physical character and spirit of the campus as a whole, the North Campus Corridor as a district, and the greater K-State community. Framing goals, objectives and drivers within this context informed the subsequent phases of the planning process. Key goals that came out of this phase of the process were:

- Build upon the guiding principles of the 2025 Strategic Plan
- Extend the spirit of the 2012 Campus Master Plan into the North Campus Corridor
- Integrate planned and proposed projects between Kimball, College and North Manhattan Avenues and Claflin Road
- Integrate the Mid-Campus and the southern portions of the North Campus with the Campus Core

Campus Analysis

With extensive information in hand from Discovery and Goal Setting, the next step in the planning process was to complete a Campus Analysis that synthesized a rich collection of facts into a meaningful composite. The result was a conceptual plan in which the guiding principles from the 2025 Strategic Plan served as a touchstone. It also provided a lens through which all the previous and on-going plans were integrated into a cohesive framework of recommendations for facility, open space and infrastructure improvements and phasing. Like a sketch before a painting, the conceptual plan was illustrative, but not detailed. It captured the most basic organizational aspects of Kimball Avenue and the North Campus Corridor. It also foreshadowed the elemental aspects of the final development plan, such as land use, building use, massing and placement, public realm and open space hierarchy, and circulation and parking patterns.

Final Plan

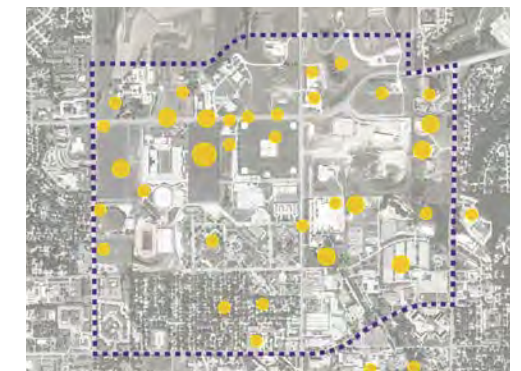
The final plan was created by synthesizing the best ideas generated in the prior phases of the project. The new buildings, multimodal circulation network, stormwater management opportunities, signage and wayfinding standards, detailed landscape improvements and design guidelines illustrated in this proposal represent the future vision for a cohesive and coordinated development framework through 2025 and beyond. The final plan supplements the 2025 Strategic Plan, the 2012 Campus Master Plan, and the University's Capital Improvements Plan for the Board of Regents in order to logically guide future North Campus Corridor development and growth initiatives.



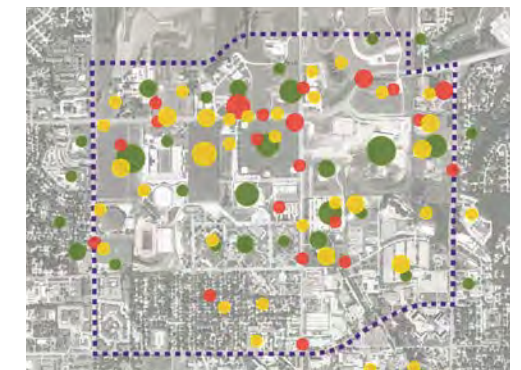
Kick-Off Meeting, Identified Strengths



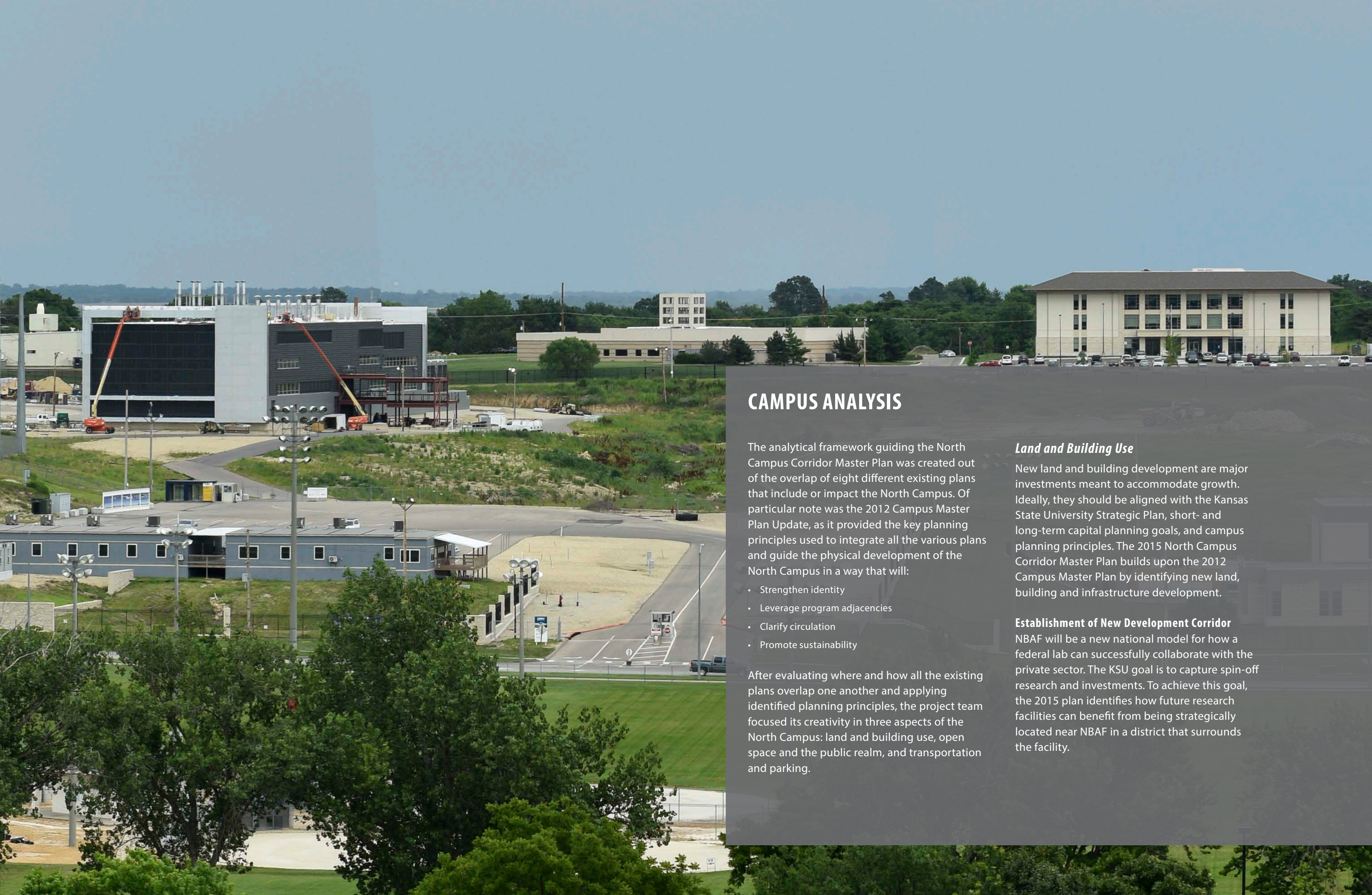
Kick-Off Meeting, Identified Weaknesses



Kick-Off Meeting, Identified Opportunities



Kick-Off Meeting, Composite



CAMPUS ANALYSIS

The analytical framework guiding the North Campus Corridor Master Plan was created out of the overlap of eight different existing plans that include or impact the North Campus. Of particular note was the 2012 Campus Master Plan Update, as it provided the key planning principles used to integrate all the various plans and guide the physical development of the North Campus in a way that will:

- Strengthen identity
- Leverage program adjacencies
- Clarify circulation
- Promote sustainability

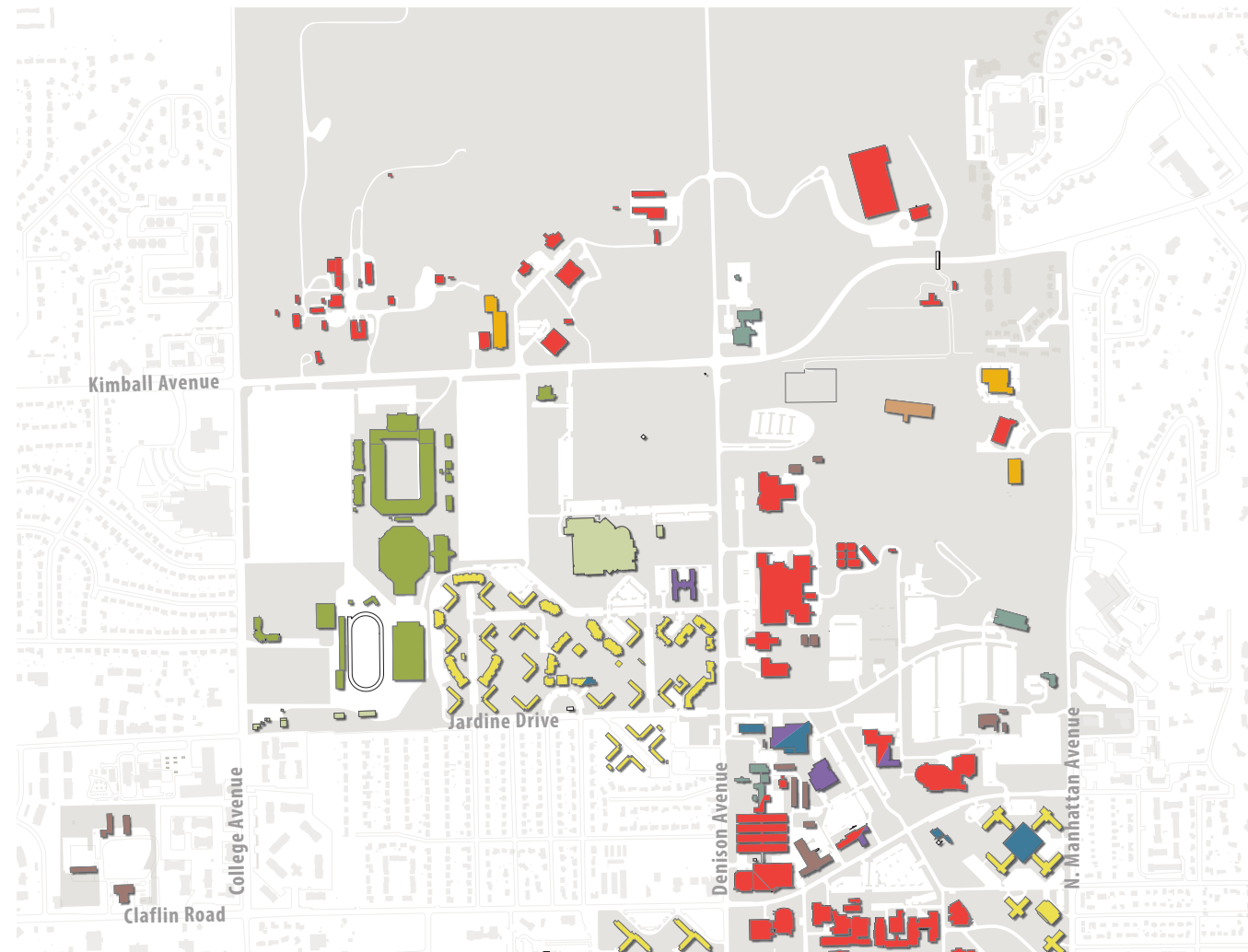
After evaluating where and how all the existing plans overlap one another and applying identified planning principles, the project team focused its creativity in three aspects of the North Campus: land and building use, open space and the public realm, and transportation and parking.

Land and Building Use

New land and building development are major investments meant to accommodate growth. Ideally, they should be aligned with the Kansas State University Strategic Plan, short- and long-term capital planning goals, and campus planning principles. The 2015 North Campus Corridor Master Plan builds upon the 2012 Campus Master Plan by identifying new land, building and infrastructure development.

Establishment of New Development Corridor

NBAF will be a new national model for how a federal lab can successfully collaborate with the private sector. The KSU goal is to capture spin-off research and investments. To achieve this goal, the 2015 plan identifies how future research facilities can benefit from being strategically located near NBAF in a district that surrounds the facility.



Existing Building Use

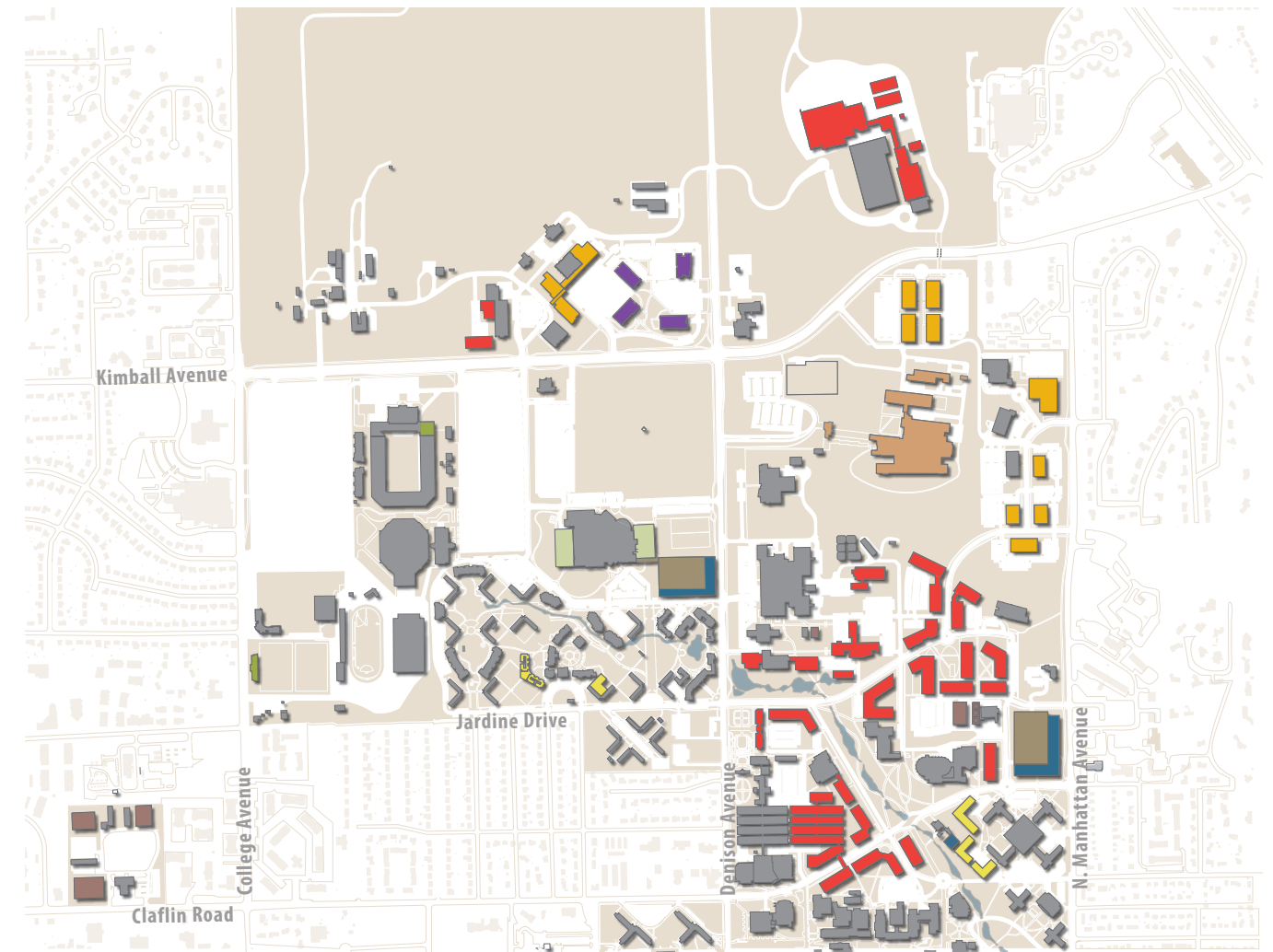
■ Academic/ Research	■ Student Life/ University Administration	■ K-State Athletics
■ Research/University Partners	■ Office/ University Partners	■ Recreation Services
■ Student Housing	■ Facilities Services	■ Public Use
		■ NBAF

New facilities built in this corridor will support partnerships that leverage the extensive resources and capabilities of Kansas State University and NBAF. KSU envisions that the North Campus Corridor will be a magnet for partners from all sectors of society and from around the globe. The Research Park and the new KSU Foundation Office Park will both build on K-State strengths including:

- Innovation – with a proven record of research and discovery
- Talent – with easy access to faculty expertise and a pipeline of undergraduate and graduate student talent
- Professional training – including specialized executive education and– Technology-based training

To facilitate this strategic opportunity, KSU has actively planned with the City of Manhattan. The North Corridor Campus Master Plan integrates the City’s focus on infrastructure, economic growth and development, comprehensive land-use planning, and long-range transportation planning with the University’s focus on implementing the K-State 2025 Strategic Plan, initiatives that build on KSU strengths, corporate partnerships and co-location, and the synthesis of six previous master plan studies that impact the corridor.

To support this vision and position the North Campus Corridor future development for success, KSU has



Proposed Building Use

■ Existing Buildings	■ Student Life/ University Administration	■ Recreation Services
■ Academic/ Research	■ Office/ University Partners	■ Parking Garages
■ Research/University Partners	■ Facilities Services	■ NBAF
■ Student Housing	■ K-State Athletics	

invested more than \$240,000,000 in the past 11 years. The University and Department of Homeland Security are exploring a new national model for how a federal lab can successfully collaborate with the private sector, including organizing a summit to begin a national conversation with companies and producer groups about how NBAF can partner with them.

Increased connectedness throughout the campus

The 2015 plan identifies how the placement and location of future buildings can increase connectedness throughout the campus. In particular, replacement of surface parking lots with buildings and sidewalks will help improve the character of key

corridors, especially in relation to the campus core, which will encourage movement between formerly disparate parts of the campus.

Improvement of campus edges

Strategically placed facilities at campus edges, especially along Kimball, College, Denison, and North Manhattan Avenues, will help establish a clear physical and psychological boundary that reinforces a campus experience and strengthens campus identity.

Achievement of desired densities

Increased building densities will help achieve a number of desired goals such as opportunities for



Existing Open Space

- | | | |
|-----------------|---|--------------------|
| Open Space | Agricultural Research Fields (Cultivated) | Steep Slopes |
| Wooded Area | Agricultural Research Fields (Rangeland) | Campus Creek Basin |
| Athletic Fields | Plaza/Courtyard | Snow Storage |

projected program space, interdisciplinary learning and research expansion, a more walkable campus, increased human activity, and increased safety.

Synergy of program adjacencies

The expansion of academic and research facilities north of Claflin Road between Denison and North Manhattan Avenues will allow for co-location opportunities between the University and the research district. It will also accomplish desired adjacencies for the Colleges of Agriculture and Veterinary Medicine facilities.

Open Space and Public Realm Enhancements

The North Campus Corridor Master Plan identifies numerous opportunities for enhancing open space and the public realm through design and preservation. The proposed open spaces include a range of typologies in order to meet the many goals of the master plan. These include edges and entrances, quadrangles, plazas, courtyards, natural greens, agricultural lands, woodland and riparian habitats, and playing fields. The following are key elements of the proposed open space and public realm plan.



Proposed Open Space

- | | | |
|---|--|-------------------------|
| Proposed campus building | Agricultural Research Fields (Rangeland) | Outdoor Gathering Space |
| Multi-Purpose Open Space | Display Area | NBAF |
| Wooded Preserve | Athletics and Recreation Fields | Ag. Water Drainage |
| Agricultural Research Fields (Cultivated) | Stormwater Management | Campus Creek Basin |

As a historic land grant institution in a native prairie setting, agricultural research fields (both cultivated and rangeland) located north of Kimball Avenue are planned to remain intact, separated from planned KSU Foundation development near the intersection of Kimball and Denison Avenues.

New outdoor gathering spaces, multi-purpose open spaces, and display areas will help enforce campus identity and experiences. For example, new outdoor gathering spaces near Athletic venues and within student housing area can efficiently and effectively

accommodate large groups during key events. Also, display areas and multi-purpose areas can be used to celebrate the purpose and achievements of KSU through public art, interpretative installations, or both.

The Campus Creek Basin is a significant open space feature and resource for education, recreation and inspiration. This resource can be enhanced and strengthened if it is treated as a continuous, intermittent stream. The boundary shown on the *Proposed Open Space* figure is similar to the 100-year

floodplain. In some areas it has been expanded to incorporate areas that would be naturally part of the basin if the existing buried pipes were daylighted. The open space concept recommends daylighting Campus Creek segments that are currently contained in underground pipes. It also incorporates open space concepts proposed in the 2012 Campus Master Plan and supports findings from the 2025 Kansas State University Master Plan Stormwater System Update (2013).

The proposed buildings on the north side of Claflin Road at Mid-Campus Drive and along Campus Creek south of the International Student Center may be built in close proximity or, in some cases, within the 10 and 100 year floodplain. It will be critical to consider stormwater detention capacity within their design at the same time as meeting the needs for improved outdoor open space for students.

Because this study includes and refines sites identified in the 2012 Campus Master Plan, it is critical to recognize the need for additional study of stormwater run-off along Campus Creek, within the North Campus Corridor, and in the adjoining city neighborhoods. As previously undeveloped land is converted into building and parking facilities, increased impervious surface area will decrease stormwater quality, increase run-off volumes and rates, and decrease flood storage capacity unless best management practices are identified and constructed. In particular, new buildings constructed south and east of Coles Hall will affect the predominant use of the land for stormwater management and the expansion of the University Gardens. Similarly, the proposed increased density of buildings along Claflin Road, Mid-Campus Drive and south of the International Student Center should prompt a study for that portion of the watershed that impacts Campus Creek.

Preservation of key natural resource areas (such as wooded areas and Campus Creek) and the research fields will reflect a variety of campus values including history, sustainability, wellness, and excellence. In particular, the identification of stormwater management areas are good examples of how

the use and placement of open space can meet multiple goals. This is especially true of the proposed restoration of Campus Creek, which can retain its current function as a snow storage area, but also assist in stormwater management, serve as a campus amenity, be an interpretive site, and provide an important pedestrian corridor among different areas of the campus.

The existing landscape typologies found in the campus core can be extended into the North Campus to provide a similar quality and scale of space, integrate the overall campus character and pedestrian experience, and improve connections throughout the campus.

TRANSPORTATION AND PARKING

Parking

Existing Campus Parking

An inventory of existing parking spaces on campus and parking occupancy data is provided in the Campus Parking and Transit Study in the Appendix. The total number of existing parking spaces on campus is 11,253, which does not include the athletics parking lots on the east and west sides of Bill Snyder Family Stadium. At peak times, the campus parking lots are 81 percent occupied.

Removal of Parking

Many new buildings are to be constructed on the site of existing surface parking lots in the North Campus area and in the core campus. The parking lots to be removed are indicated on the parking removal figure. Of particular note is that many of these parking lots to be removed are currently at or near capacity during peak times. Therefore, the parking spaces that will be removed must be replaced in other locations.

The total number of parking spaces to be removed for the entire campus is 4,895. Of the total number of spaces to be removed, 3,699 are in the North Campus area. More specifically, most of the parking to be removed is in the area bounded by Claflin Road, North Manhattan Avenue, Jardine Drive, and Mid-Campus Drive. Additional information regarding parking space removal is included in the Appendix.

Proposed Campus Parking Supply

Enrollment projections were used to estimate the future parking needs of the campus. The Campus Parking and Transit Study in the Appendix found the ratio of students to parking spaces on the campus to be 0.54, which is comparable with many peer institutions. The ratio of faculty and staff to students is projected to remain constant, so estimating parking needs based on student growth is representative of overall campus growth. To support 2,479 additional students, 1,339 new parking spaces are needed to maintain current parking ratios.

The campus parking calculations are shown below.

Campus Parking to be Removed:

North Campus area:	3,699 spaces removed
Core Campus area:	<u>1,196 spaces removed</u>
	4,895 spaces removed

Additional Parking for Campus Growth:

2,479 students x 0.54 parking spaces per student =	
	1,339 new spaces needed for growth

New Campus Parking Proposed:

Justin Hall parking garage:	800 spaces
North Campus parking garage:	1,600 spaces
Edwards Hall parking garage:	800 spaces
East stadium commuter parking:	1,650 spaces
North Campus surface parking:	<u>1,748 spaces</u>
	6,598 new spaces proposed

The calculations indicate that the number of parking spaces provided in the master plan will replace all of the parking spaces that are to be removed, and provide adequate capacity for campus growth. At these levels, the entire campus parking supply is estimated to be 80 percent occupied at peak demand, which closely matches the current peak occupancy on campus.

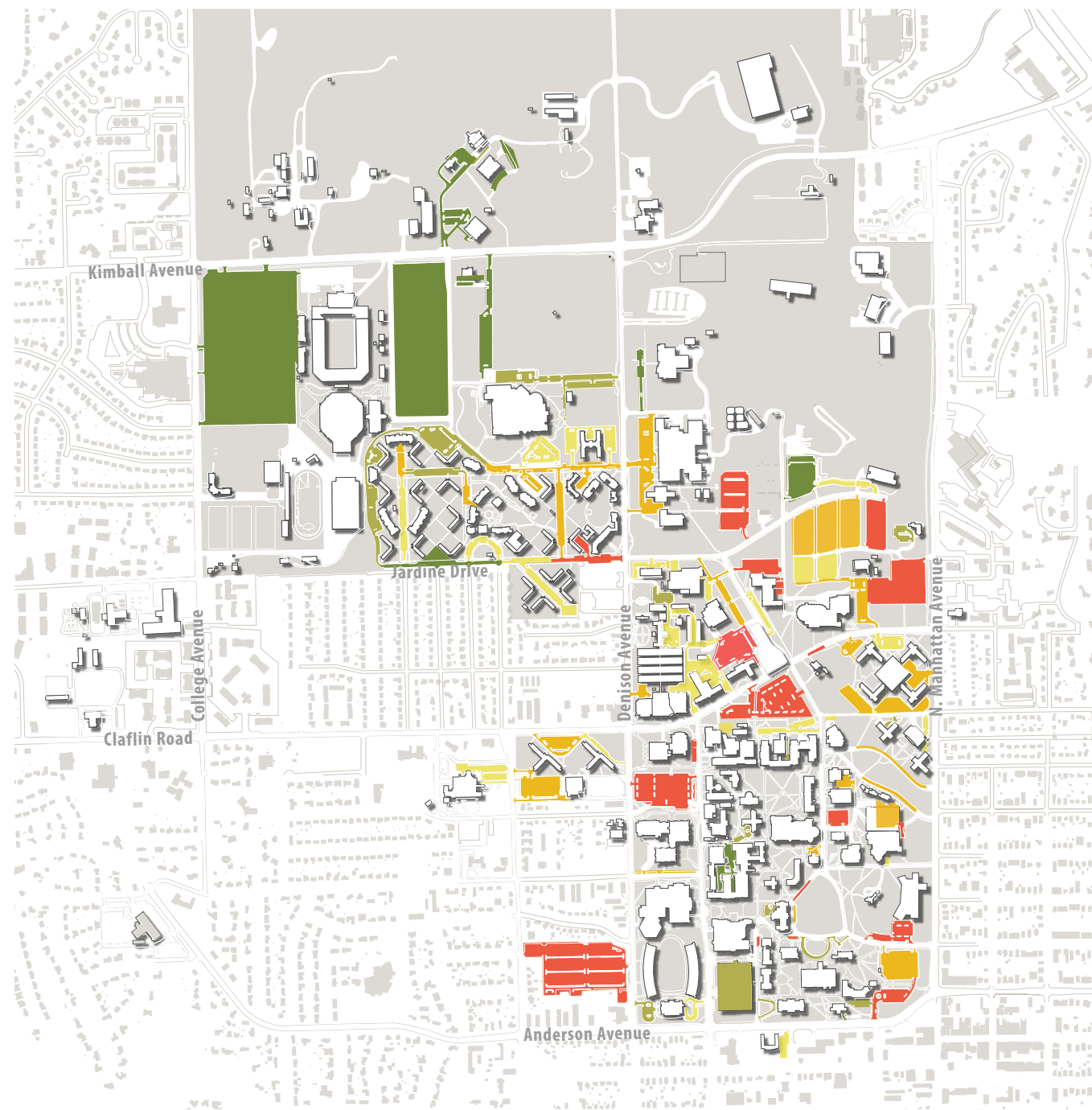
Parking ratios can be lower on urban campuses that are walkable and well served by transit. When students, faculty, and staff have more modes of transportation from which to choose, the campus becomes less reliant on parking. Improving transit, bicycle facilities, and pedestrian connectivity can lead to a reduced demand for commuter parking.

Parking demand for commuters may reduce in the future, however, the reduction may be offset by the increased population of on-campus residents. On-campus residents have a higher rate of purchasing parking permits than do off-campus residents. Additional residence halls will increase the need for parking at all times of day throughout the school year. The east stadium commuter lot will not be a desirable location for on-campus residents to park due to the number of conflicts with basketball and football games at the athletics complex.

To fully utilize existing resources, the parking lot on the east side of Bill Snyder Family Stadium is to be used as a commuter parking or shuttle lot. Currently the lot is minimally used, leaving at least 1,650 parking spaces available for commuters. Transit service will be necessary to provide transportation between the commuter lot and destinations on campus.

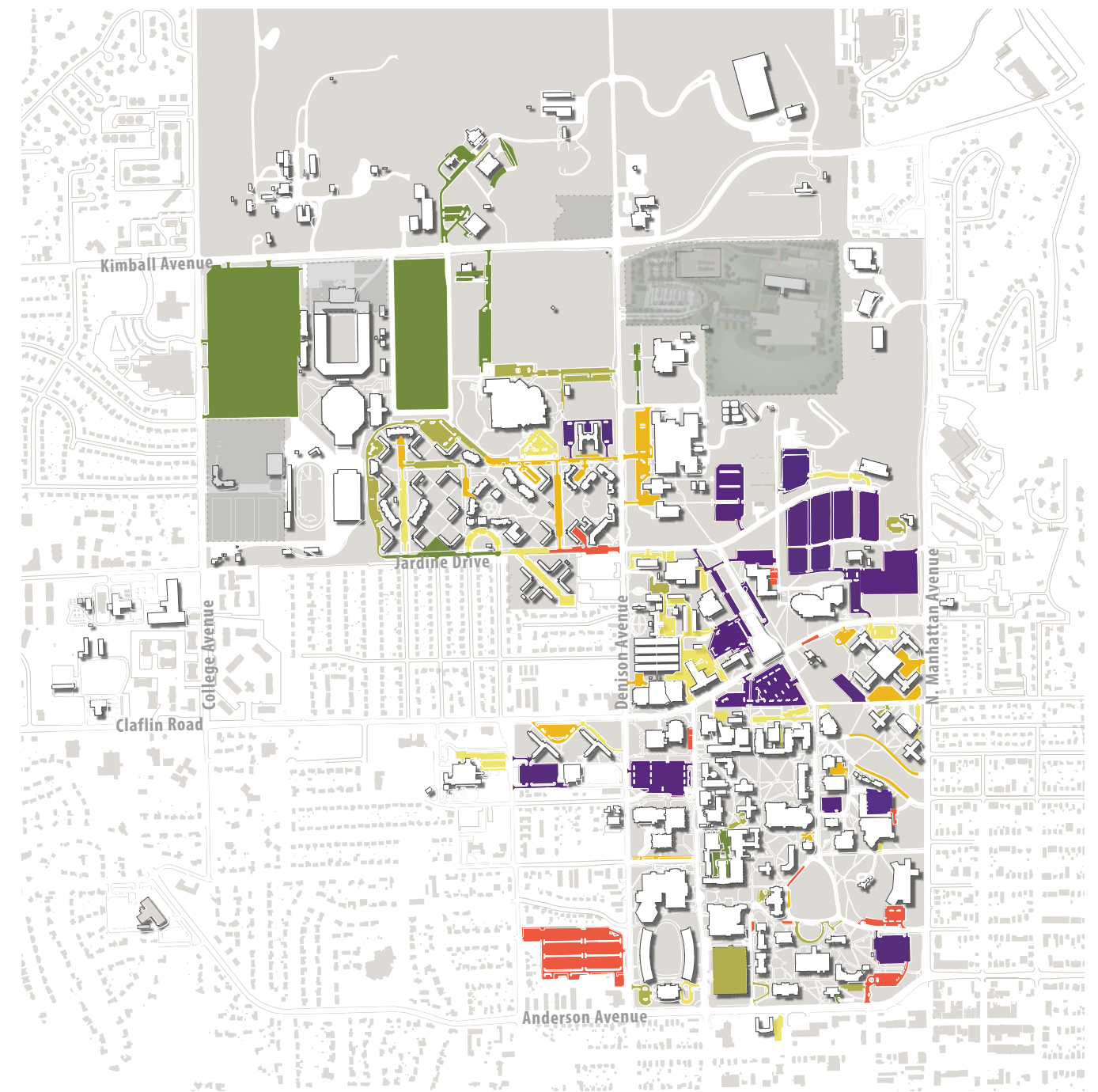
Major improvements are needed for the east stadium lot to become a commuter parking lot. The condition of the pavement at the stadium will not support everyday vehicle traffic and will need to be reconstructed before it is used on a daily basis. The current parking lot is an open expanse of asphalt. Islands should be constructed along the drive aisle on the east side of the parking lot to delineate the primary entrance and exit route of the lot. At the southeast corner of the lot, the drive aisle should be connected to Kerr Drive to allow traffic and transit buses to access Denison Avenue.

Commuter parking in the east stadium lot will require ongoing coordination with the K-State Athletics. The east stadium lot will need to be vacated before basketball and football games. This is a situation with which many peer institutions have experience, as stadium parking lots are often used for commuter parking. Access points to the parking lot will need to be secured during events. This includes the connection to Kerr Drive and connections to the parking areas to the east. These connections could be temporarily closed with gates, barricades, or removable bollards.



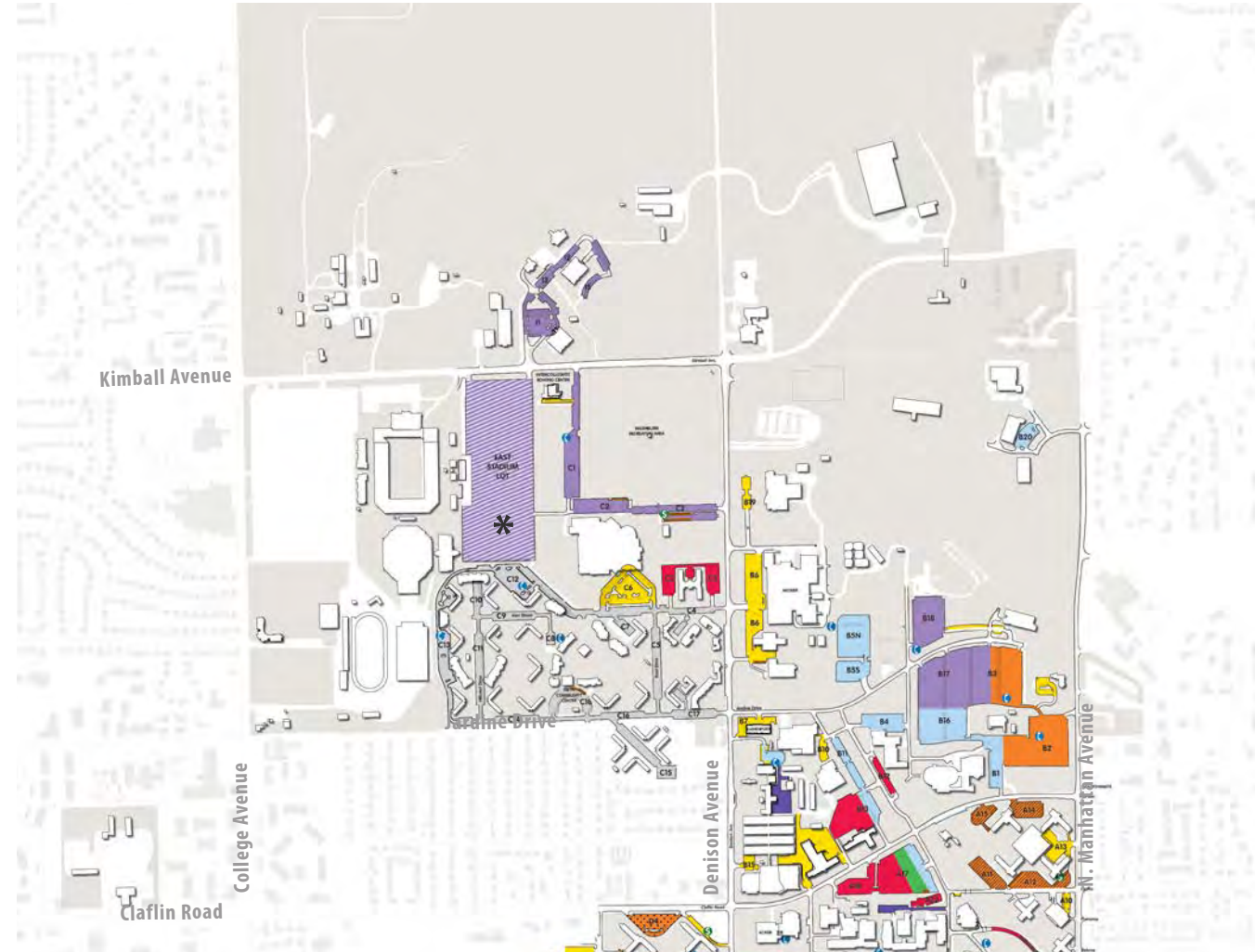
Existing Parking Occupancy

- < 50% Peak Occupancy
- 50%-70% Peak Occupancy
- 71%-85% Peak Occupancy
- 86%-95% Peak Occupancy
- > 95% Peak Occupancy



Parking Lots to be Removed

- Proposed Removed, Opportunities for Redevelopment
- < 50% Peak Occupancy
- 50%-70% Peak Occupancy
- 71%-85% Peak Occupancy
- 86%-95% Peak Occupancy
- > 95% Peak Occupancy



Existing Parking

- "W" Lot - W, E, JW, or V Permit Required
- "T" Lot - O, W, E, K, JW, JO, or V Permit Required
- "O" Lot - O, E, JO, or V Permit Required
- "D" Lot - D or V Permit Required
- "GM" Lot - GM or V Permit Required
- "R" Lot - R, GM, D, or V Permit Required
- "J" Lot - J, JO, JW, E, or V Permit Required
- "Y" Lot - Restricted Access Permit Required
- "K" Lot - K permit Required
- "Z" Lot- All KSU Permits Valid Except LR Permits
- * Permit required
- Parking Meter Lot



Proposed Parking

- Proposed Campus Building
- NBAF
- Existing Surface Parking
- Tenant Parking
- Commuter Parking
- General Campus: Surface Parking
- General Campus: Structured Parking

South of the Rowing Center and east of the east stadium lot, the existing C1 parking lot is to be expanded. This will provide approximately 500 new parking spaces. This location currently has a gravel and turf surface that is only used for football game day parking. Therefore, parked vehicles will need to be removed from this lot before home football games, but parking in this lot will not be in conflict with basketball games. New pavement for a parking lot on this site would require stormwater detention to mitigate this new impervious surface. The most likely solution will be in cisterns under the lot.

Two new structured parking garages are included in the study area. A third new garage is suggested in the Campus Parking and Transit Study in the Appendix. This additional garage is on the site of the existing surface parking lot north of Justin Hall, which is in the core campus area. The Justin Hall garage would replace a 200-space surface lot with an 800-space garage.

The largest parking garage in the North Campus area will be located near the northwest corner of North Manhattan Avenue and Claflin Road. This garage will have capacity for 1,600 vehicles and would need to accommodate many on-campus residents. Large surface lots for on-campus residents will be removed to construct this garage and other nearby facilities. Several new residence halls are also to be constructed in the nearby Derby complex. Access to the garage would be possible from the local streets on the north and west sides of the garage.

The master plan includes a parking garage on the site of Edwards Hall. This garage would have capacity for 800 vehicles, a number of these being on-campus residents. When this garage is designed, other uses may also be incorporated. There may be opportunities to provide commercial space at the street level and recreational space on the roof. A garage at this location is the most challenging of all the garage sites from an access standpoint. To provide proper separation from adjacent intersections, the entrance and exit to the garage should not be located on Denison Avenue.

The only suitable location for the entrance and exit is along Kerr Drive. The existing east driveway to the recreation center parking lot would need to be reconfigured to provide access to the garage and parking lot. This garage is also the farthest garage from core campus destinations, but is positioned convenient to transit.

Parking Policy Recommendations

Given the parking projections for the campus, it is essential that other tenants in the North Campus study area accommodate their parking needs on their sites. These tenants include the KSU Foundation, NBAF, and the Research Park.

To support the amount of structured parking shown in the master plan, parking permit fees will likely need to increase to provide some level of funding for these improvements. The cost of a constructing parking garage is estimated to be \$20,000-25,000 per space. Therefore, the 3,200 structured parking spaces in the master plan may cost as much as \$80 Million to construct. Increased parking permit fees alone will not be able to provide funding to build all of the structured parking. However, as shown in the Campus Parking and Transit Study, average parking permit fees at KSU are lower than at many peer institutions.

Given that the future parking demand may be influenced by a number of factors, the parking supply should be monitored on a regular basis to gauge the demand for parking and the timing of new facilities.

Transit

Transit and parking will become important and interconnected issues as Kansas State University implements the master plan. With the decreased parking supply in the core campus, many commuters will park in the vicinity of the east stadium and ride transit. Enhanced transit service on campus will also reduce dependence on personal vehicles for intra campus trips. This will create a more pedestrian and bicycle friendly environment, reduce vehicular circulation, and enhance mobility for all users across campus.

Transit Routes

Transit service on campus must be convenient, frequent, and reliable to be effective. Due to the number of commuters that will rely on transit at peak times, full-size 40-foot buses will be needed. Full-size buses have a capacity of 65 passengers, compared to the 20 passenger cutaway vehicles that are currently used on campus. Full-size buses will cause route times to be slightly lengthened due to less maneuverability around campus.

Three fixed routes are identified to serve the campus. The routes are described below:

Campus Circulator Route

The Campus Circulator is a comprehensive route that connects destinations in the core campus and commuter parking areas. The 5.1-mile clockwise route includes eleven stops. The route time for the Campus Circulator with full-size buses is approximately 35 minutes. Four buses are needed during peak times, resulting in 9 minute headways between buses.

Extended North Campus Circulator Route

As the North Campus matures, the Campus Circulator could also be extended to operate as the 6.9-mile Extended North Campus route. The extended route would serve new developments including the KSU Foundation north of Kimball Avenue and the Research Park along North Manhattan Avenue. These new developments are expected to have sufficient parking supply. Therefore, the goal of the Extended North Campus route is not to transport commuters to these locations, but rather to support campus mobility for students, faculty, and staff who may need to travel to these destinations from other campus locations. The Extended North Campus Circulator would make all of the stops along the Campus Circulator route, except the stop on Jardine Drive at the Veterinary Medicine complex. For this reason, the route may be used by commuters in the afternoon, as it will follow the Campus Circulator route through the core campus to the commuter parking.

The Extended North Campus Circulator route is estimated to have a 50-minute route time. Longer headways of 15 to 20 minutes would be acceptable for the long route time and lower ridership. It would not be necessary to increase headways during peak times; therefore, three full size buses would be needed for the route to provide the desired headways.

Union Express Route

The Union Express route serves the East Stadium parking lot, the Recreational Center/Jardine Apartments, the Kramer Complex, and the Student Union. This route provides direct service to the west side of campus from the east stadium lot and Edwards Garage. The route time for the Union Express route with full-size buses is approximately 20 minutes. Three buses are needed during peak times, resulting in 7 minute headways between buses.

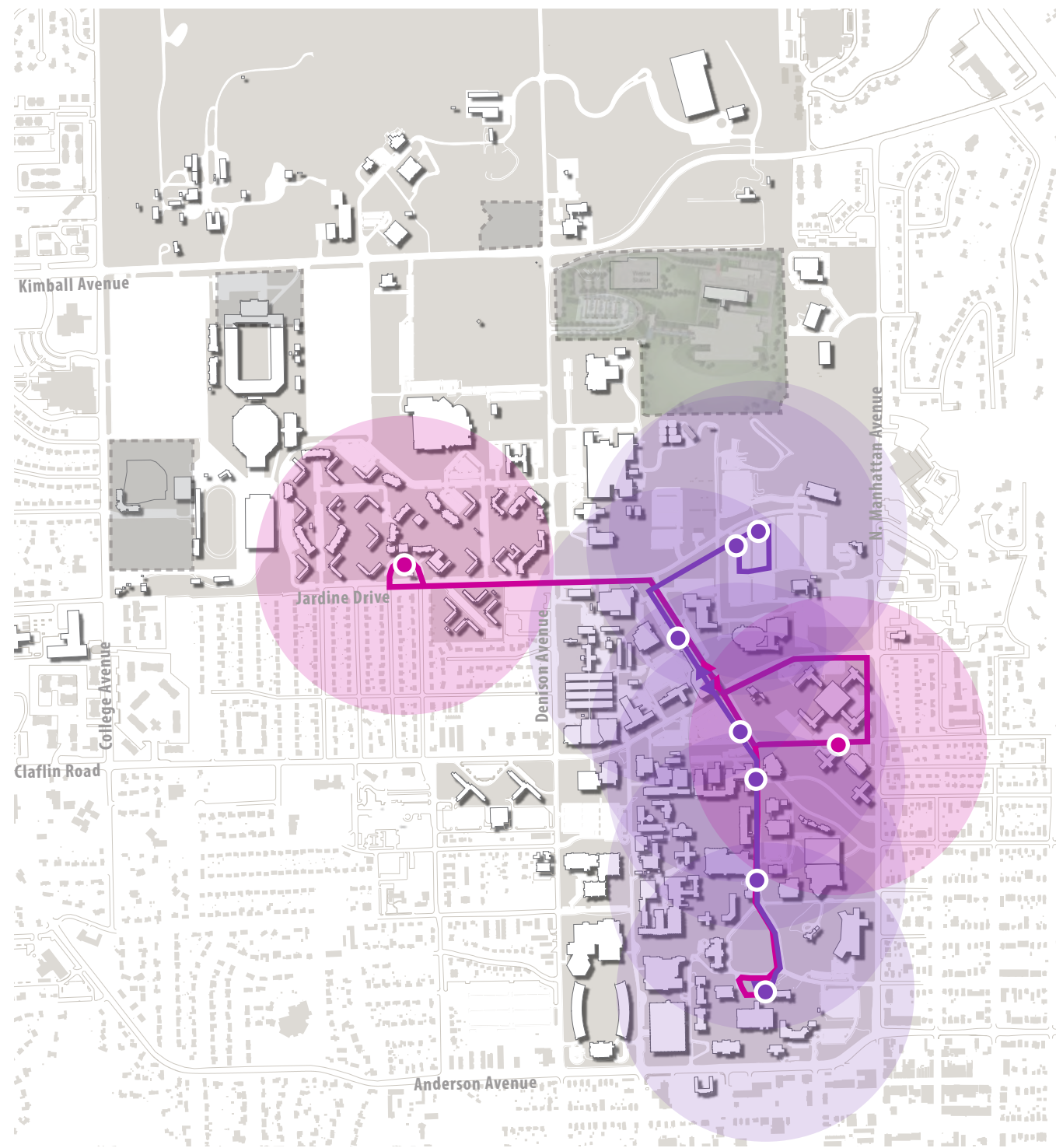
The Union Express route is an alternative to the Campus Circulator routes, which travel clockwise from the commuter parking to serve the east side of campus first. The difference in the routes will balance ridership between the routes during morning peak times.

Transit Service

Regular transit service should be provided from 6:00 a.m. to 9:00 p.m. on school days. Some form of overnight and weekend service should also be considered. The number of commuters at the east stadium parking lot will determine the frequency of service needed during peak times in the morning and afternoon. During other times of day, service frequency should be 5 to 10 minutes at major campus destinations. Overlap between routes will aid in providing the desired frequency in the campus core.

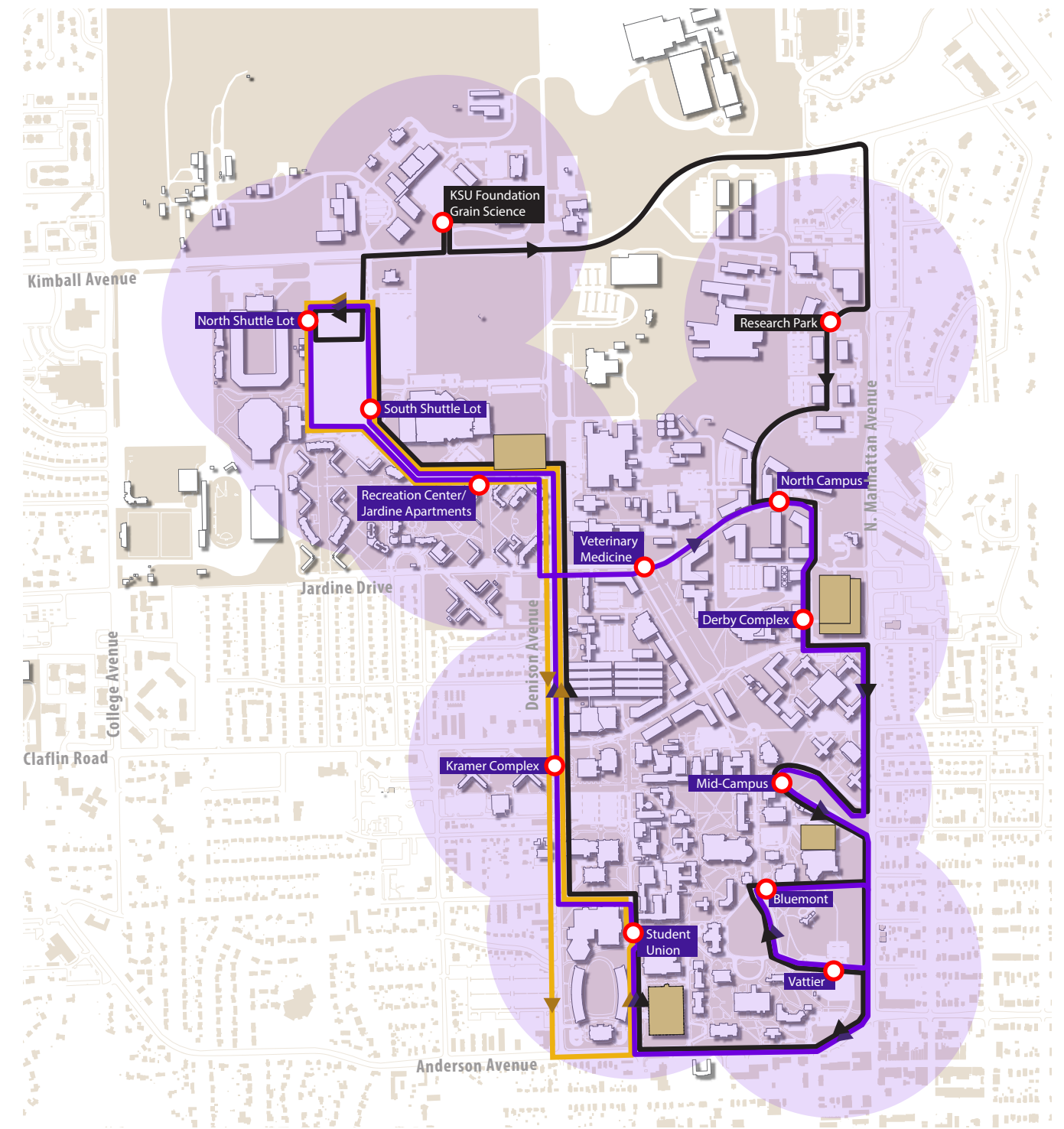
Transit Stops

The transit stops are situated to provide convenient service within 1,200 feet of major campus destinations, which is approximately a five-minute walking distance. Transit shelters should be



Existing Campus Transit Service

- Jardine Shuttle
- Campus Park and Ride
- Jardine Shuttle Stops
- Park and Ride Stops
- 5 minute walk radius
- 5 minute walk radius



Long Term Transit Plan

- Campus Circulator Route
- Union Express Route
- Extended North Campus Route
- Transit Stop
- 5 minute walk radius
- Parking Garage



provided at each stop to protect riders from the wind and precipitation while they wait for buses to arrive. Shelters will enhance the comfort of transit passengers in all weather conditions. Because the east stadium lot will accommodate more than 1,000 commuters each day, larger transit shelters should be constructed for the two stops at the east stadium parking lot. Transit stops and buses should also incorporate technology and security features, as described in the Campus Parking and Transit Study in the Appendix.

Traffic Circulation

Existing and projected future daily traffic volumes for the major streets in the study area are shown on the traffic flow figures. Traffic volume projections were developed by compiling the traffic generation estimates for all proposed projects in and around the study area. This includes NBAF, KSU Foundation, KSU Research Park, and the Via Christi medical office building. The parking changes proposed for the campus will also have an effect on travel patterns, which is reflected in the traffic volume projections.

Kimball Avenue from College Avenue to Denison Avenue

Significant traffic growth is projected on Kimball Avenue (in the future). This is due to new projects in the area and commuter traffic to and from the shuttle parking lot. The increased volume will exceed thresholds for a four-lane undivided street; therefore, capacity improvements will be needed for Kimball Avenue. The design of the improvements must take into account game day traffic flow.

To provide additional capacity on Kimball Avenue, the street should be widened to a five-lane section, with a center two-way left-turn lane. The five-lane section will provide space for eastbound and westbound left-turning traffic to decelerate and queue without impeding through traffic. The five-lane roadway will also allow for the greatest flexibility in traffic patterns adjacent to the athletics complex.

Proper planning of intersections along Kimball Avenue will make traffic flow safely and efficiently. Several existing driveways should be removed,

gated, or relocated to align with other intersections. Starting at the west end of the corridor, these changes are described below:

- Gate 4 access point to the west stadium parking lot should remain gated and closed at all times. This is an emergency exit from the athletics complex.
- Gate 5 should remain open and be stop sign controlled.
- The access point to the agronomy farm on the north side of Kimball Avenue should be relocated to align with the driveway at Gate 5 to create one intersection.
- Gate 6 should be removed. The Vanier Complex parking lot on the north side of the stadium should be connected to both the east and west stadium parking lots.
- Gate 7 should remain open and be stop sign controlled.
- The driveway to the Kansas Crop Improvement Association should be closed. A new drive should be provided to the facility from the north on the agronomy farm property.
- Gate 8 aligns with the driveway to the Grain Science facilities and it should remain open. A traffic signal should be installed at the intersection when traffic volumes satisfy warranting criteria.
- Gate 9 should be closed, except for game day traffic operations.
- A driveway should be provided for the KSU Foundation property along the north side of Kimball Avenue. The driveway should be spaced 600 to 700 feet from Gate 8 and from Denison Avenue to provide ample room for queuing in the left-turn lanes on Kimball Avenue. The driveway should be stop sign controlled.

A new roadway should be constructed linking the agronomy farm to the Grain Science complex. This new roadway would also provide access to the Kansas Crop Improvement Association facility, and link all properties to the signaled intersection at Gate 8. In order for the traffic signal to operate efficiently, it should be coordinated with the traffic signals at College Avenue and at Denison Avenue to provide progression for traffic on Kimball Avenue.

Game Day Traffic Flow

To improve traffic flow entering the stadium parking lot on game days, several turn lanes are recommended on Kimball Avenue. An eastbound right-turn lane should be provided at the Gate 5

driveway to the west stadium parking lot. A long eastbound right-turn lane should be provided along Kimball Avenue at Gate 7. The additional length of the lane will allow for buses to load and unload adjacent to Bill Snyder Family Stadium.

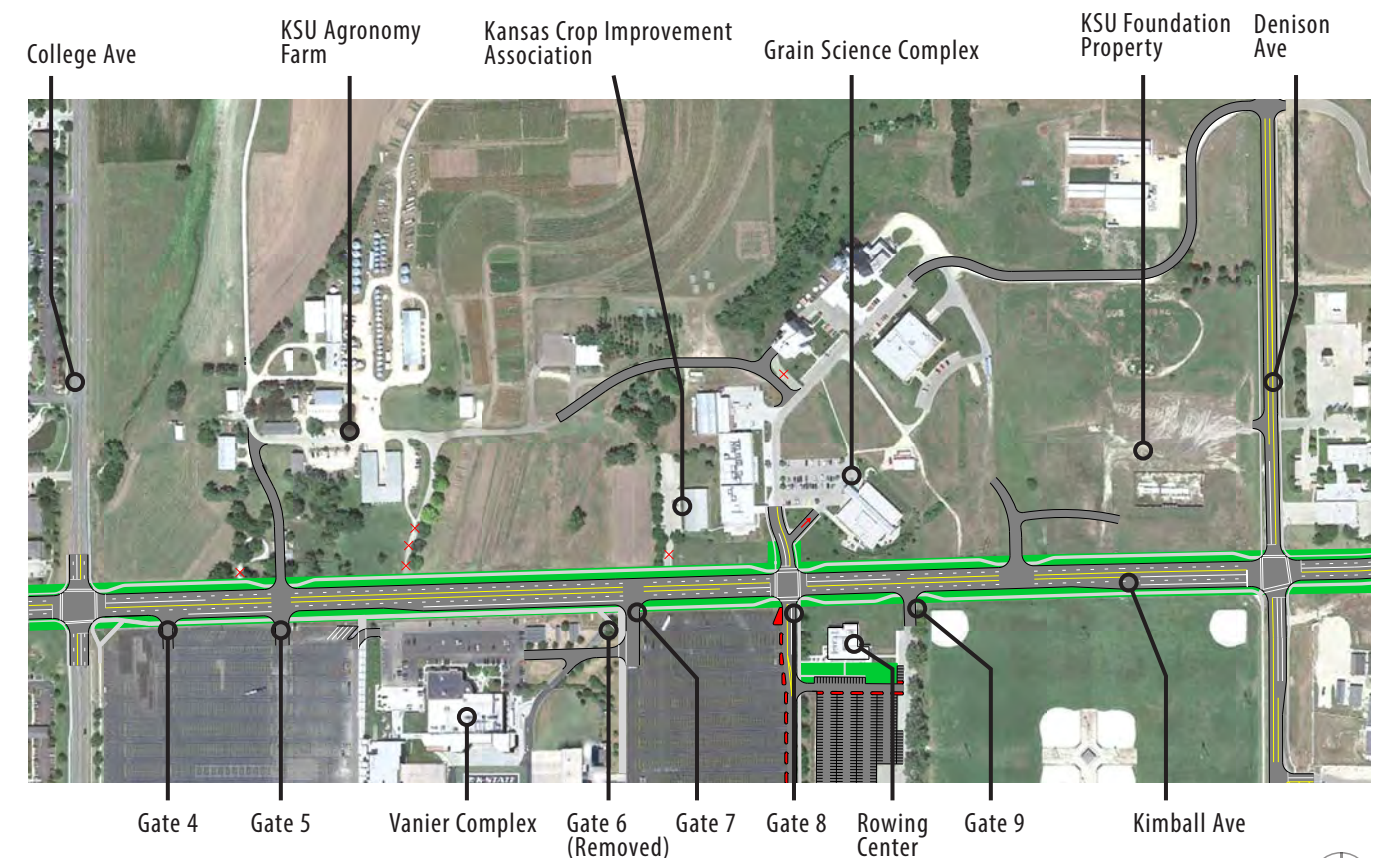
All game day pedestrians crossing Kimball Avenue from the parking areas north of Kimball Avenue should be guided to cross directly north of the entrance gates to the east and west sides of the stadium. Police officers should stop traffic for pedestrians to cross at both of these locations. Given the high volume of pedestrians during game days, the traffic volumes on Kimball Avenue, and the fact that game days are infrequent events, no permanent control devices are necessary at these crossings.

Exiting traffic on game days should be routed so that all vehicles exiting the east stadium onto Kimball Avenue are directed to the east. All vehicles exiting

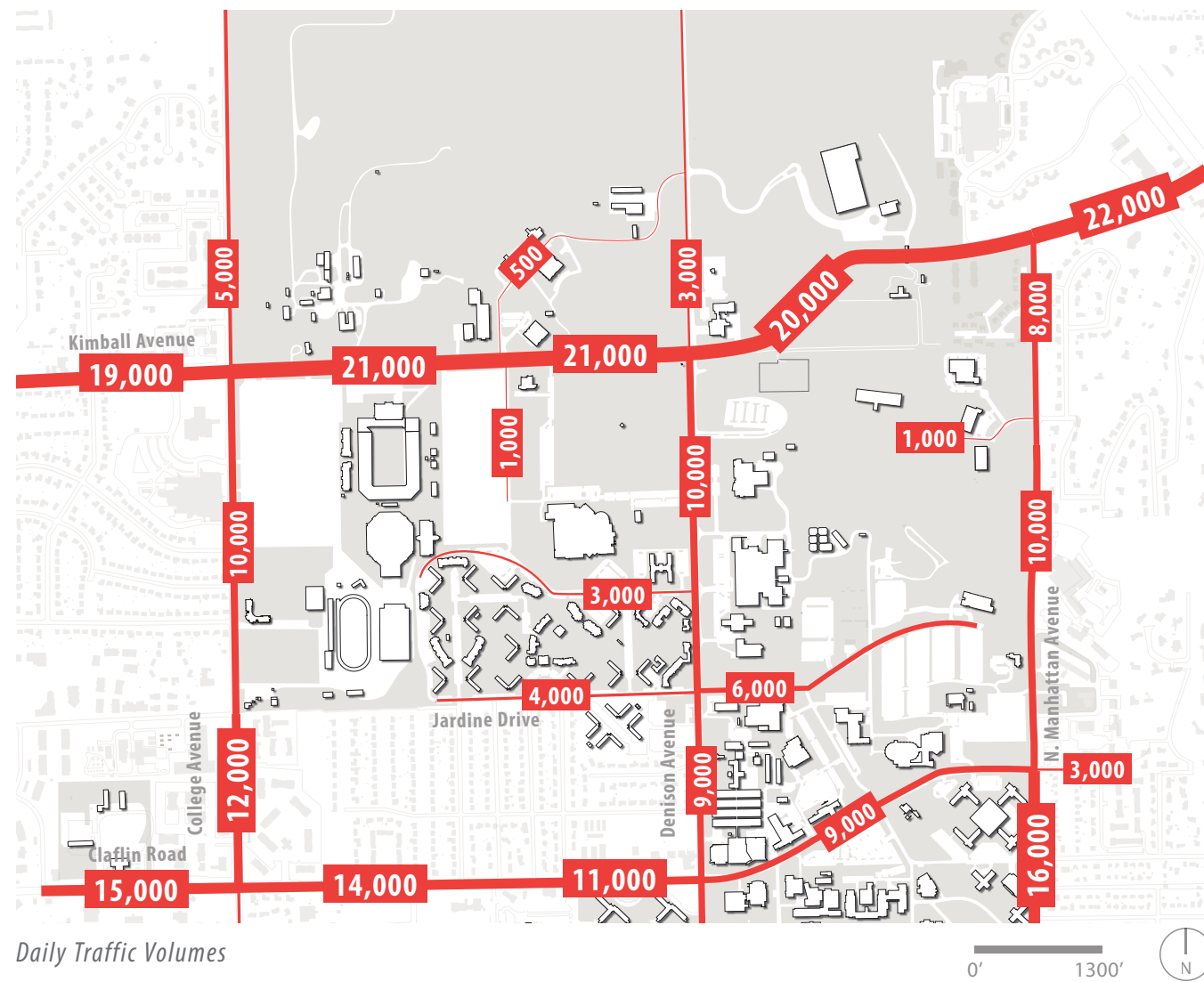
the west stadium lot onto Kimball Avenue should be directed to the west. The result is that there will be no vehicle traffic on Kimball Avenue between the east and west parking lots. This will allow game day pedestrians to exit the stadium and walk directly north across Kimball Avenue without conflict with moving traffic. Buses may also park in this area while passengers load following the game. Police officers may need to be available in this area following the game to stop pedestrians for a short duration to allow buses to exit.

Kimball Avenue from Denison Avenue to North Manhattan Avenue

To the east of Denison Avenue, there are reverse curves with tight radii, superelevation, and narrow lane widths. The horizontal and vertical curves



Kimball Avenue, Proposed Alignment

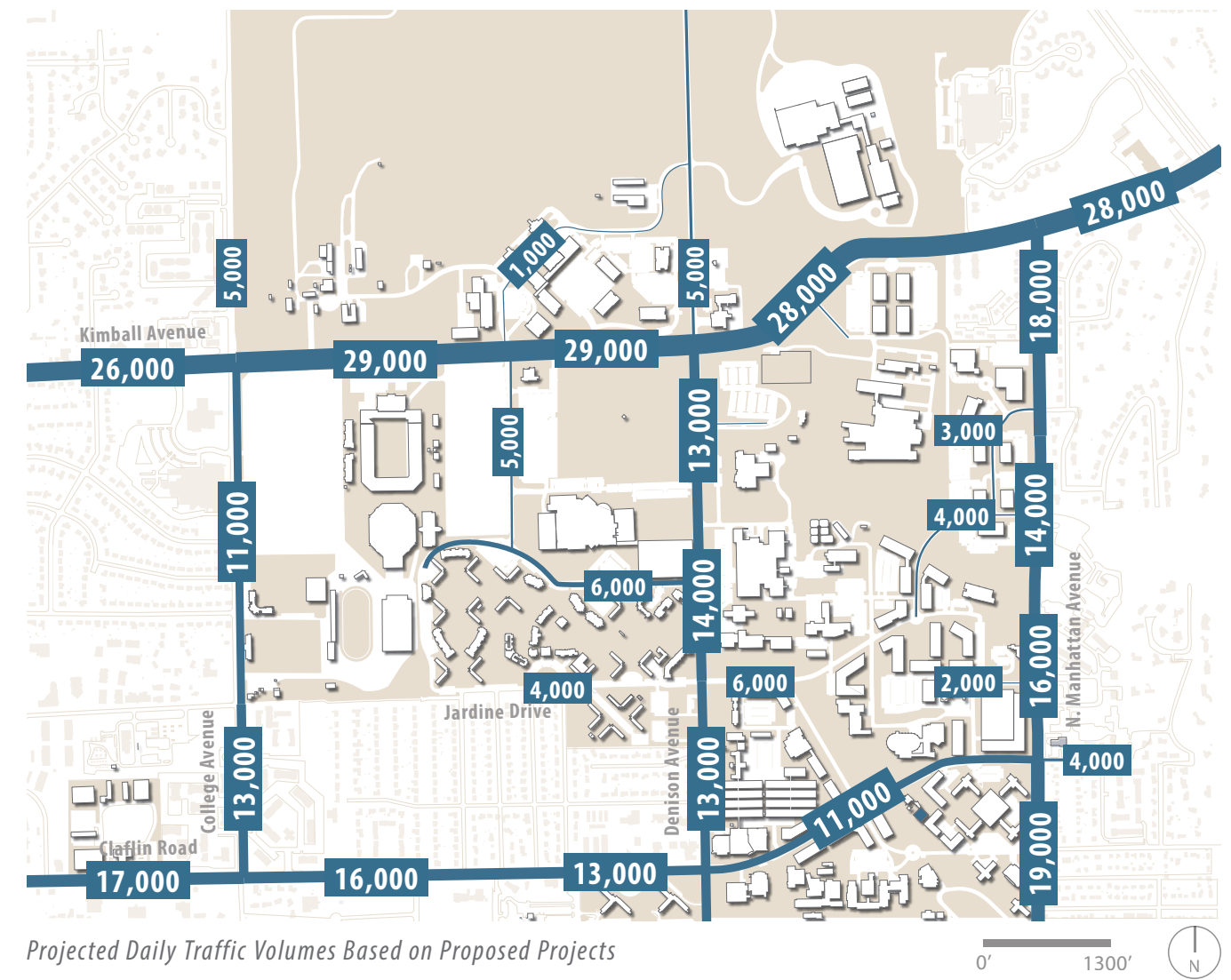


Daily Traffic Volumes

limit intersection sight distances from the existing service driveway to NBAF. This driveway currently serves limited traffic, but it will become the access point to the northern portion of the Research Park development. These conditions lead to driver discomfort and potential safety concerns.

Kimball Avenue improvements east of Denison Avenue should include widening to a five-lane section with a center two-way left-turn lane. The roadway could be narrowed to the east of the NBAF driveway where there are no intersections. Therefore, the continuous center turn lane is not needed through this entire section. The widening should include standard lane widths as well.

To provide safe and efficient access to the northern portion of the Research Park, the reverse curves on Kimball Avenue should be realigned to have larger radii consistent with the design speed of the roadway. A short tangent should be provided between the curves to provide an appropriate transition for drivers. The superelevation should be eliminated to allow for proper drainage. The access point to the future Research Park should be relocated approximately 200 feet to the west, which will increase the distance from the Denison Avenue intersection. The new access point would be located in the tangent section of Kimball Avenue, providing a better sightline. A traffic signal should be installed at the intersection when traffic volumes satisfy warranting criteria.



Projected Daily Traffic Volumes Based on Proposed Projects

Denison Avenue

Denison Avenue will experience modest growth in traffic volumes as the North Campus area develops. The projects proposed along the corridor are not large traffic generators. Further, some of the parking areas adjacent to Denison Avenue near the core campus are to be removed, which will alter existing travel patterns.

A three-lane roadway can accommodate the projected traffic volumes on Denison Avenue through the study area. The three-lane section will maintain the pedestrian scale and environment desired through the North Campus area. A northbound right-turn lane should be constructed at the Kimball Avenue intersection for this heavy traffic movement.

North of Kimball Avenue, Denison Avenue should have a three-lane section with a center two-way left-turn lane. In the section north of the driveway that serves the equine center, there are few access points, so a continuous turn lane is not necessary. Therefore in this stretch Denison Avenue should transition to the existing two-lane section. Paved shoulders should be constructed to protect drivers from edge drop-offs and to accommodate cyclists.

College Avenue

Traffic volumes on College Avenue will be nominally affected by the build out of the North Campus area. South of Kimball Avenue, the corridor is in a mature

and developed area. Traffic volumes are low on College Avenue to the north of Kimball Avenue. For this reason, it would be more efficient for College Avenue to have a three-lane section with a center two-way left-turn lane north of Kimball Avenue. College Avenue can transition to match the existing two-lane section with paved shoulders to the north of Hillview Drive. Paved shoulders protect drivers from edge drop-offs and accommodate cyclists. The change in lane configuration would allow the northbound curb lane on College Avenue to become a right-turn lane at the Kimball Avenue intersection.

A drop-off lane should to be provided along the east side of College Avenue adjacent to Tointon Family Stadium. This will allow for buses to load and unload adjacent to the facility.

To improve visibility for drivers and pedestrians, lighting levels should be increased along College Avenue. Current street lighting is minimal along College Avenue, with only one luminaire installed at each intersection. Increased light levels will be beneficial during evening events at the athletics complex when large numbers of pedestrians cross College Avenue.

Clafin Road

Clafin Road is an important east/west collector street that bisects the campus and provides access to a number of campus facilities. Pedestrian safety is a concern on Clafin Road as there are a number of existing pedestrian crossings, which leads to congestion during class change times. Traffic volumes on Clafin Road are projected to increase slightly in the future.

To maintain a safe environment for pedestrians, traffic calming measures should be considered on Clafin Road. The master plan includes a single-lane roundabout to calm traffic on Clafin Road at the first intersection west of North Manhattan Avenue. The roundabout will need to be designed to accommodate trucks, as there are several delivery and loading areas in the vicinity. Queueing of vehicles could be an issue at the roundabout. Long queues from the traffic signal at North Manhattan Avenue or from the parking garage entrance could extend into the roundabout and create gridlock.

Move-in times at the residence halls could also create long queues on Clafin Road. An alternative traffic calming measure that could be considered at this location is a raised intersection. Raised intersections consist of a flat raised area covering the entire intersection with ramps on all approaches that work similarly to speed humps. A raised intersection could also be considered at 17th Street where the shared use path will connect to Clafin Road.

To minimize conflicts between vehicles and pedestrians crossing Clafin Road, several grade separated crossings are proposed. At Campus Creek, a new bridge is to be constructed that will raise Clafin Road, allowing a shared use path to pass underneath the roadway. The design of the bridge could include separating the two directions of traffic and incorporating horizontal curves to slow the speed of traffic. A pedestrian bridge is also to be constructed across Clafin Road as part of the proposed campus buildings on either side of the roadway, just east of 17th Street.

To the west of Denison Avenue, Clafin Road could be reduced to a three-lane roadway with bike lanes along each side of the street. Traffic volumes are projected to increase, but will remain within the range of volumes that can be accommodated by a three-lane roadway. The roadway currently functions similar to a three-lane roadway when vehicles waiting to turn left block a through lane.

Jardine Drive

In the North Campus area, Jardine Drive will become a more significant route, providing access to new campus buildings. A single-lane roundabout is shown where Jardine Drive intersects with a connector street to the Research Park. The design of the roundabout will need to accommodate trucks, as there are several delivery and loading areas in the vicinity of the roundabout.

North Manhattan Avenue

Traffic volumes on North Manhattan Avenue are projected to increase substantially due in large part to the Research Park. North Manhattan Avenue is currently being widened to a five-lane roadway from Kimball Avenue south to Research Park Drive. In the future, the City plans to continue the widening

to Clafin Road. This five-lane roadway will provide ample capacity to accommodate new traffic from the Research Park and serve as a convenient route to and from the northeastern portion of the campus.

When the south driveway from the Research Park is connected to North Manhattan Avenue, it should be aligned with Baker's Way, which is an existing driveway on the east side of North Manhattan Avenue. Adequate intersection sight distance should be provided when improvements in the area are made, since the vertical curvature of the roadway limits sight distances at the existing driveway.

At full build-out of the Research Park, projected traffic volumes will satisfy warrants for a traffic signal at the Baker's Way intersection. The Research Park plan includes parking lot access points that are in close proximity to North Manhattan Avenue. A raised median should be constructed along the Research Park south driveway to limit these parking lot access points to right-turns only. The median will prevent the potential for conflicts between left-turn traffic and queued vehicles from the signal.

Other Area Traffic Circulation Improvements

Several of the streets surrounding the campus are projected to be at or near capacity at full build out. Additionally, many of these roadways are in mature areas with development close to the roadway, which makes widening projects difficult and costly. In light of this, it is important that other roadways in the area are able to provide alternate routes to travel through this portion of the city.

College Avenue

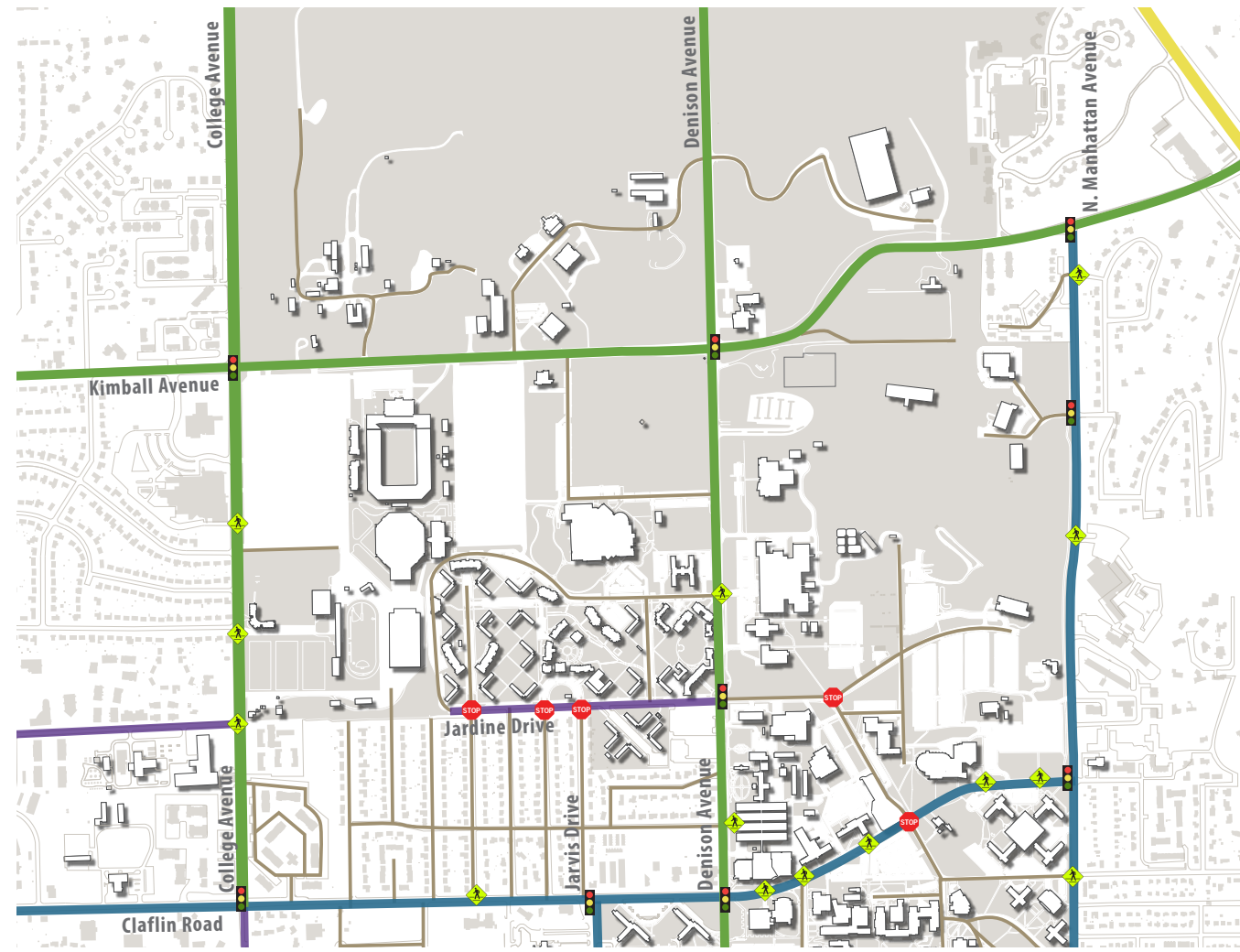
College Avenue is a four-lane undivided arterial street located on the western edge of the study area. Traffic volumes indicates that the roadway is below capacity. College Avenue becomes a collector street with a two-lane cross section to the south of Clafin Road. This portion of College Avenue diminishes in function because it does not connect directly with Anderson Avenue.

College Avenue could serve as a significant route for through traffic if it provided a more direct north/south connection between Clafin Road

and Anderson Avenue. This connection could reduce the volume of through traffic on Denison Avenue. The City's long-range strategy should include an extension of College Avenue to Anderson Avenue, including intersection improvements with traffic signal installation. This connection would be expected to increase traffic volumes on College Avenue, which may have other impacts. The extension of College Avenue south of College Heights Road will necessitate property acquisition from an existing church.

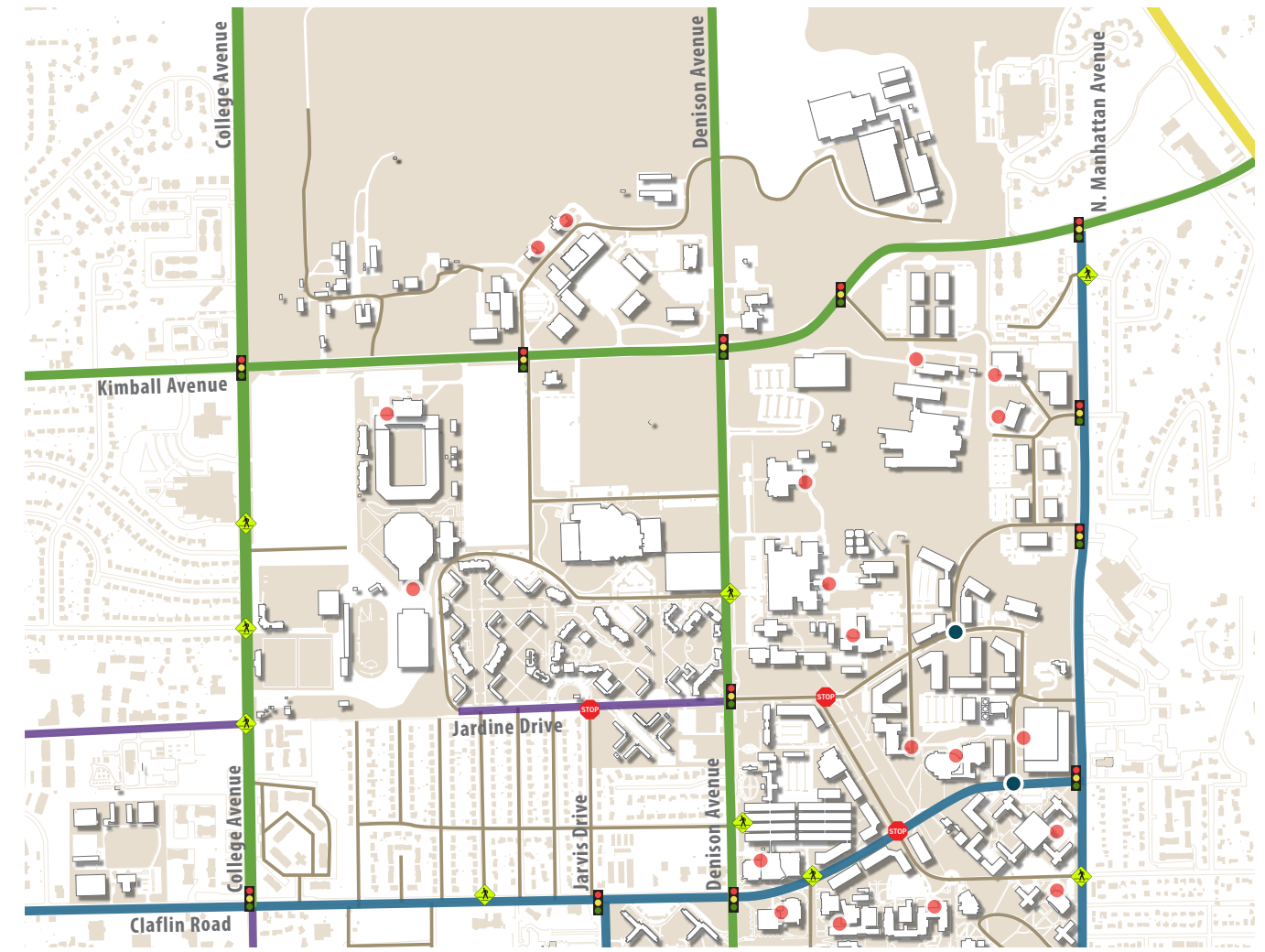
Marlatt Avenue

As development increases in the northern part of the city, Marlatt Avenue will eventually become the next major east/west arterial street. Carefully managing access is important along the corridor to ensure the roadway can function as an alternate route to Kimball Avenue. It would be desirable to improve the sharp curvature of Marlatt Avenue near Seth Child Road. While no easy solution is evident, it would be appropriate to plan for the desired connection and type of access to Seth Child Road. Such a connection could allow College Avenue and Marlatt Avenue to serve as another route for game day traffic to exit to the west.



Existing Vehicle Transportation

- | | | |
|--|------------------------|-------------------------------|
| | Crosswalks | Street Classifications |
| | Traffic Signal | US Highway 24 |
| | Delivery Loading Areas | Minor Arterial |
| | Multi-Way Stop | Major Collector |
| | | Minor Collector |
| | | Local streets |



Proposed Vehicle Transportation

- | | | |
|--|------------------------|-------------------------------|
| | Crosswalks | Street Classifications |
| | Traffic Signal | US Highway 24 |
| | Delivery Loading Areas | Minor Arterial |
| | Multi-Way Stop | Major Collector |
| | Roundabouts | Minor Collector |
| | | Local streets |

Pedestrian and Bicycle Circulation

The master plan was developed with the goal of providing a safe environment for bicyclists and pedestrians on campus. Several changes are recommended to accomplish this goal, including closing several streets to vehicle traffic, utilizing traffic calming measures where appropriate, expanding transit service, and reducing parking in certain areas of campus.

Enhancing bicycle and pedestrian accommodations can reduce the demand for parking on campus and reduce vehicle traffic and congestion on the surrounding street network. There is a large population of students, faculty and staff who live within one-half mile of campus. Many nearby residents walk or bicycle to campus, but a number of them also purchase parking permits and drive vehicles to campus each day.

Bicycle and pedestrian accommodations are proposed to provide continuity and direct routes to campus destinations. The routes shown on the proposed circulation figure establish a grid network of routes connecting the campus to the surrounding areas. The types of facilities are described in the following paragraphs.

Shared Use Paths

Shared use paths are generally 10 to 12 foot wide paved surfaces that allow for bicycle and pedestrian traffic. Shared use paths can be adjacent to roadways in lieu of sidewalks. These facilities are typically used adjacent to high volume or high speed roads where on-street bicycle accommodations are not preferred. Shared use paths can also serve as trails where there are no streets.

In the campus core, both 17th Street and Mid-Campus Drive are currently being reconstructed to be shared use paths. The new paths will be 26 feet wide and closed to vehicle traffic, accommodating bicycle and pedestrian traffic.

The master plan proposes expanding the network of shared use paths on campus by extending the

path on Mid-Campus Drive to the north under Claflin Road, into the North Campus area. A new shared use path is also proposed along the south side of Claflin Road. A path is also provided to link Jardine Drive to the existing path along North Manhattan Avenue. A new shared use path is proposed between Jardine Drive and Kimball Avenue.

Bike Lanes

Bike lanes provide a dedicated lane for bicyclists to ride within the roadway. Bike lanes are beneficial where there is a high volume of cyclists and a differential in speed between bicycle and vehicle traffic.

Bike lanes are proposed on Claflin Road, west of Denison Avenue. Reducing the roadway from four-to three-lanes will provide the space needed for the bike lanes. Currently there is a considerable amount of bicycle traffic on this portion of Claflin Road. Paved shoulders are recommended along Denison Avenue and College Avenue north of Kimball Avenue. These shoulders will serve the same function as bike lanes, by providing space for bicyclists to ride separated from vehicle traffic.

Bike Boulevards

A bike boulevard is a shared roadway for bicycles and motor vehicles without marked bicycle lanes. Through movement of bicycles may be given priority over motor vehicle travel on bike boulevards. Bike boulevards are typically lower volume roadways with reduced travel speeds.

A bike boulevard is proposed on Jarvis Drive, continuing south of Claflin Road on Sunset Avenue. This route will provide a north/south bicycle route as an alternative to Denison Avenue. Denison Avenue has a significant volume of traffic and vehicle speeds that are not compatible with the characteristics of bike boulevards. Jarvis Drive has regular on-street parking activity that constricts the travel way when vehicles are parked along both sides of the street. Parking may have to be restricted along at least one side of the street to increase comfort for cyclists.

Jardine Drive in the North Campus area is proposed to be a bike boulevard. In conjunction with existing and proposed shared use paths, a continuous east/west bicycle route will be created through the area.

Claflin Road is an existing bike boulevard through campus. The proposed traffic calming measures on Claflin Road will reinforce the characteristics of the bike boulevard. The city should consider extending the bike boulevard designation to the east of North Manhattan Avenue to connect adjacent neighborhoods. The proposed bike lanes and bike boulevard designations for Claflin Road will create another east/west bike route across campus.

Sidewalk Recommendations

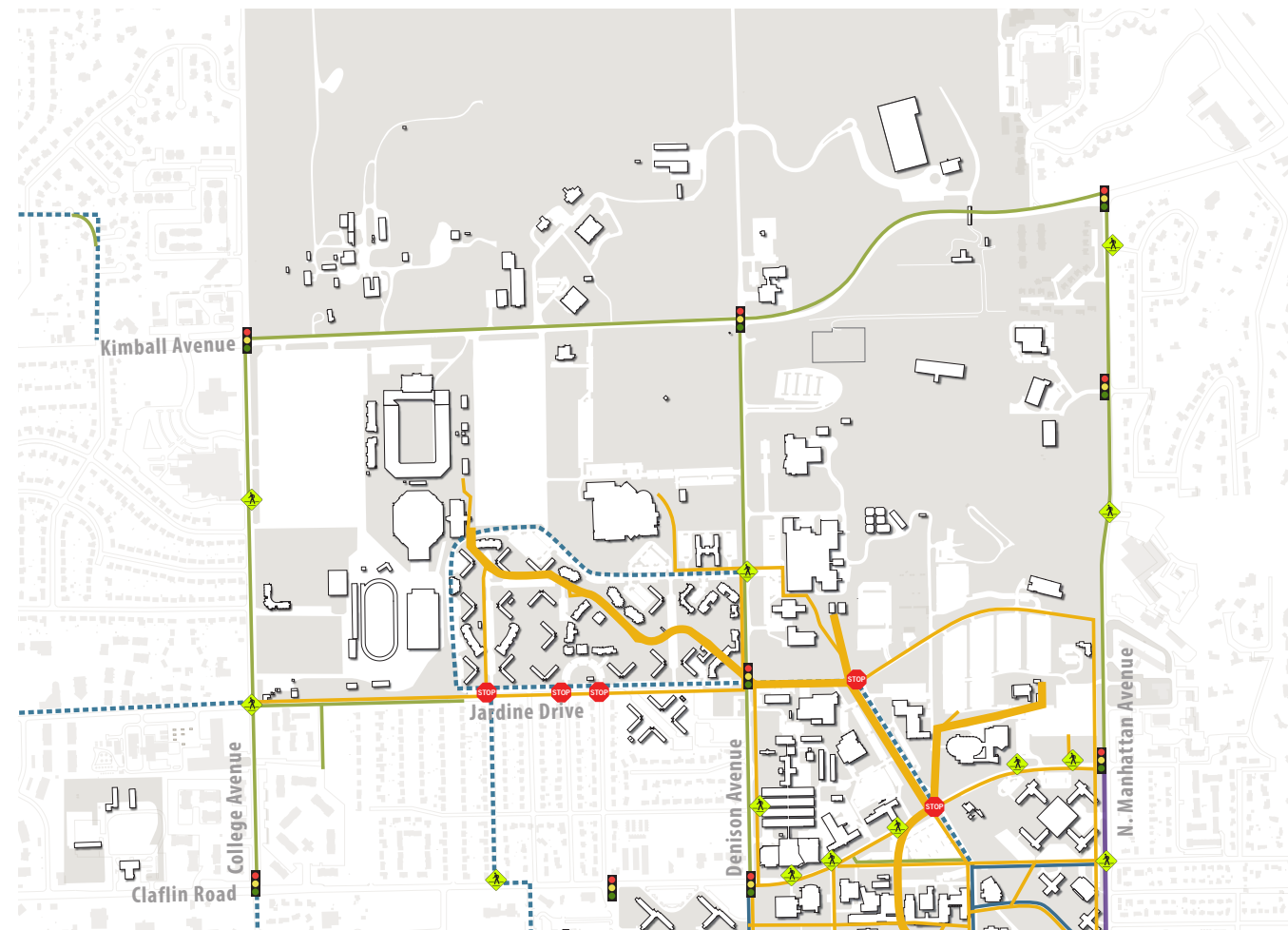
Many new sidewalks are shown on the proposed pedestrian and bicycle circulation figure that will link campus buildings. The minimum sidewalk width on campus is five feet, but wider sections should be considered along major pedestrian routes.

Some of the new sidewalks proposed are along both sides of Denison Avenue from Kimball Avenue to the equine center driveway. These sidewalks will be beneficial on game days as well, when parking occurs in this area. Another important sidewalk connection runs east/west through the Jardine Apartments from the Denison Avenue and Jardine Drive intersection to the athletics complex. Sidewalks should also be provided throughout the Research Park and KSU Foundation developments to link them to the surrounding sidewalk network.

When new sidewalks are constructed, it is important to provide separation between the sidewalk and the street. The separation creates a buffer space that increases comfort for pedestrians and can discourage mid-block pedestrian crossings. At intersection and driveways, the separation between the sidewalk and street should be reduced to as little as five feet. This allows pedestrians to cross the street at the intersection, in full view of traffic from all directions.

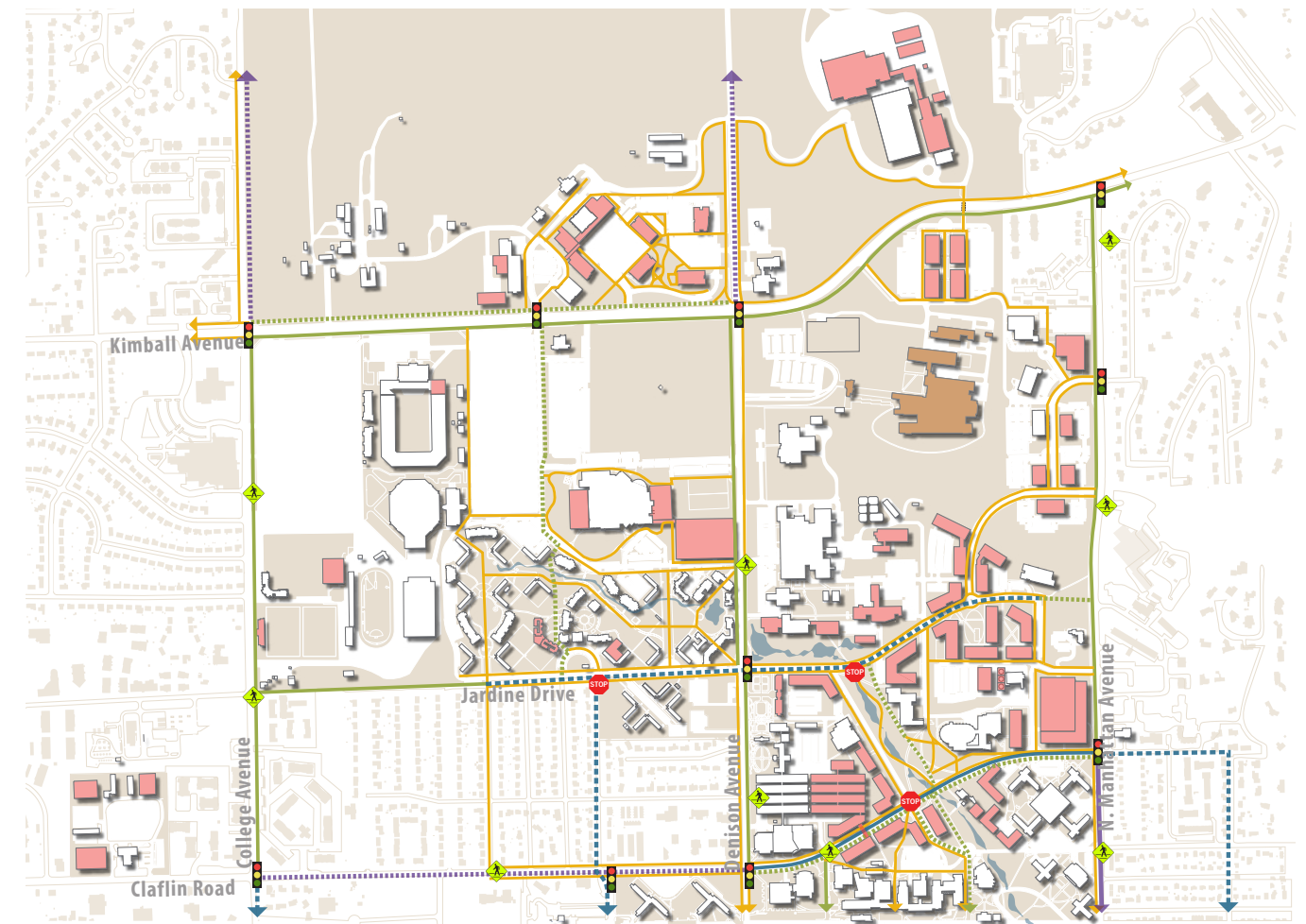
Bicycle Amenities

Amenities can be provided that will encourage bicycling on campus. An ample amount of bike racks should be provided in locations convenient to campus buildings. Bike racks should be accessible from bike routes so cyclists are not induced to use sidewalks. Bike lockers or covered bike parking may also be desired by commuters. Another amenity to consider for cyclists would be bike repair stations.



Existing Bicycle and Pedestrian Circulation

- Pedestrian Walkways
- Primary Pedestrian Spine
- Bike lanes
- Bike Boulevards
- Planned Bike Boulevards
- Shared Use Paths
- STOP Multi-Way Stop
- ◆ Crosswalks
- Signaled Intersections



Proposed Pedestrian and Bicycle Circulation

- Proposed campus building
- NBAF
- Pedestrian routes
- Existing shared use paths
- Proposed shared use paths
- Existing bike boulevards
- Proposed bike boulevards
- Existing bike lanes
- Proposed bike lanes
- STOP Multi-Way Stop
- ◆ Crosswalks
- Signaled Intersections





CAMPUS MASTER PLAN

“Positioned in close proximity to existing cutting-edge research facilities and the National Bio and Agro-Defense Facility, corporate partners will have the chance to build professional relationship as well as leverage the strengths of K-State in the areas of student talent and technical innovation.”

- Rand Berney, Chairman
Board of Directors for the KSU Foundation



Existing Campus Master Plan



Proposed Campus Master Plan

- Proposed campus building
- NBAF

The North Campus Master Plan addresses the type and location of facilities necessary for the University to achieve its visionary goal to be a top 50 public research university by 2025. Not only will the proposed improvements advance the goals of the KSU Strategic Plan, they will also enhance the experience of students, faculty, staff, and visitors to the campus. Therefore, it is important to identify the

status and phasing of particular projects in order to inform where synergies can be achieved between City of Manhattan and Riley County planning, infrastructure investments can be coordinated, the potential for public and private partnerships can be identified and optimized, and other opportunities for efficient use of resources can be explored.

Planned and Proposed Projects

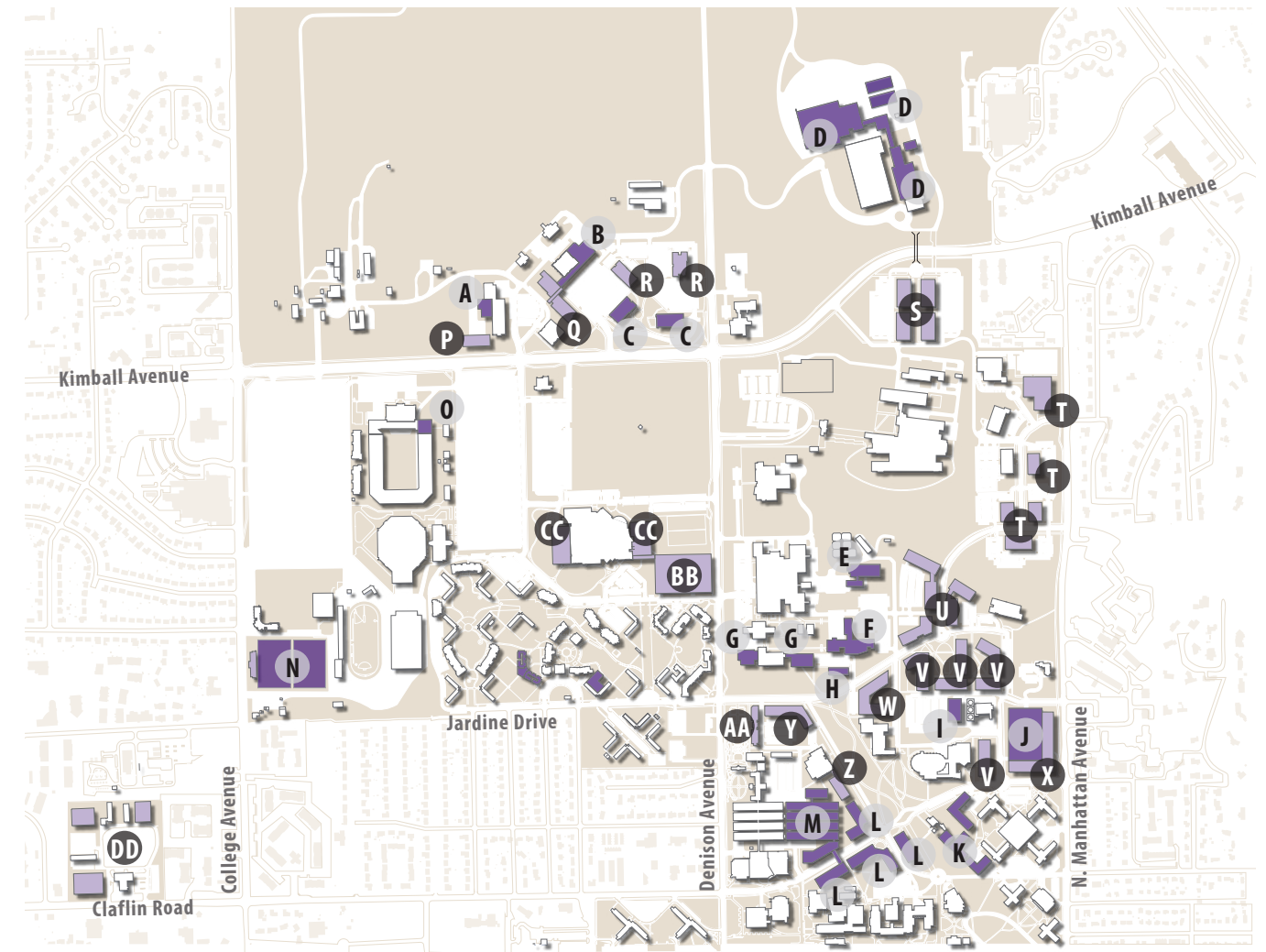
A series of detailed studies support the North Campus Corridor Master Plan, including the following:

- 2012 Campus Master Plan Update
- KSU Foundation Research Park Master Plan
- Veterinary Medicine Master Plan
- KSU Foundation Office Park Master Plan
- K-State Athletics Master Plan,
- Grain Sciences Complex
- Purebred Beef Teaching Unit Relocation

Each of these studies documents additional findings and recommendations about the future of the physical campus that inform the broad vision for North Campus Corridor development.

Implementation of the Master Plan will be realized over time through the completion of individual projects. The exact order, disposition and design details of proposed projects will naturally evolve as KSU priorities are confirmed and additional detailed program and funding information for each project is developed.

Because Kansas State University is a dynamic institution, the planning, design, and construction of a number of campus improvement projects were already in progress during the master planning process. These projects are identified on the *Project Phasing* map as letters A through O. Proposed projects, which fulfill facility, open space and infrastructure needs identified in the 2012 Campus Master Plan, are noted on the map as letters P through DD. These campus improvements do not have a dedicated funding source at this time. As their need becomes more defined over time they will be coordinated with academic, student life and capital planning efforts.



Project Phasing

- | | | |
|---|--|--|
| <p>PLANNED</p> <ul style="list-style-type: none"> A Wheat Innovation Center Greenhouses B Grain Science Expansion C KSU Foundation Office Park D Purebred Beef Unit Relocation E Equine Performance Testing Facility F One Lab G Coles Addition East and West H Small Animal Clinic I Chilled Water Plant J Parking Garage 1 | <ul style="list-style-type: none"> K International Student Center Expansion L Agricultural Research and Extension Facility M Agricultural Greenhouse expansion N Athletics Practice Field Redesign O Bill Snyder Family Stadium Master Plan - Phase 4 Northeast Connector <p>PROPOSED</p> <ul style="list-style-type: none"> P Agronomy Education Center Q Agronomy/Grain Science Expansion R KSU Foundation Office Park S Research North of NBAF T Research Science Park | <ul style="list-style-type: none"> U Collaborative Research Buildings North of Jardine Drive V Academic/ Research Expansion W Call Hall Addition X Replacement of Pittman Hall Y Mid Campus Drive Infill Z Dole Addition AA University Gardens Support BB Parking Garage 2 CC Peters Athletic Center Additions East and West DD Facilities Relocation on Clafin Road |
|---|--|--|

Phasing Table

Map Reference	Project Name	Use/ Type	Approx. Footprint GSF	Approx. Total GSF
PLANNED PROJECTS				
A	Wheat Innovation Center Greenhouses	Academic/ Research	15,000	15,000
B	Grain Science Expansion		28,500	28,500
C	KSU Foundation Office Park	Office / University Partners	40,000	120,000
D	Purebred Beef Unit Relocation	Academic/ Research	45,900	45,900
E	Equine Performance Testing Facility	Academic/ Research	27,500	27,500
F	One Lab	Academic/ Research	36,000	144,000
G	Coles Addition East	Academic/ Research	19,350	58,000
H	Coles Addition West	Academic/ Research	23,200	69,500
H	Small Animal Clinic	Academic/ Research	12,500	12,500
I	Chilled Water Plant	Facilities	16,300	16,300
J	Parking Garage 1	Parking	98,500	492,500
K	International Student Center Expansion	Student Life	6,500	13,000
L	Agricultural Research and Extension Facility	Academic/ Research	95,000	380,000
M	Agricultural Greenhouse Expansion (Two stories, upper level greenhouse, lower level storage)	Academic/ Research	100,000	200,000
N	Athletics Practice Field Redesign	Athletics and Recreation	170,000	170,000
O	Bill Snyder Family Stadium Master Plan Phase 3B - Northeast Connector	Athletics and Recreation	12,000	12,000

Map Reference	Project Name	Use/ Type	Approx. Footprint GSF	Approx. Total GSF
PROPOSED PROJECTS				
P	Agronomy Education Center	Academic/ Research	15,000	15,000
Q	Agronomy/ Grain Science Expansion	Research	38,500	38,500
R	KSU Foundation Office Park	Research	40,000	120,000
S	Research North of NBAF	Research	80,000	240,000
T	Research Science Park	Research	106,500	319,500
U	Collaborative Research Buildings North of Jardine Drive	Academic/ Research	102,500	717,500
V	Academic/ Research Expansion	Academic/ Research	143,000	715,000
W	Call Hall Addition	Academic/ Research	41,000	120,000
X	Replacement of Pittman Hall	Student Life	59,500	238,000
Y	Mid Campus Drive Infill	Academic/ Research	50,000	200,000
Z	Dole Addition	Academic/ Research	15,000	60,000
AA	University Gardens Support	Academic/ Research	13,700	13,700
BB	Parking Garage 2	Parking	119,350	359,100
CC	Peters Athletic Center Additions East / West	Sports and Recreation	38,400/ 36,600	38,400/36,600
DD	Facilities Relocation on Claflin Road	Facilities	88,000	88,000

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DESIGN GUIDELINES

The design guidelines for the North Campus Corridor build on the previous efforts of the 2012 Campus Master Plan Update. These high level design considerations are intended to promote a cohesive aesthetic character for the Kansas State University campus as a whole.

INTRODUCTION

The Kansas State University campus has generally developed in three perceptual campus “zones”. Each zone consists of features that are common across the campus and variations that make each zone distinctive. These differences are driven by a variety of factors such as the era that the buildings were developed, building function and use, and accommodation of circulation and parking.

Historic Core

The historic core zone is generally defined as the campus south of Claflin Road, with many of the buildings constructed in the first half of the twentieth century, and a highly pedestrian oriented campus setting.

Building materials in this zone are predominantly pitched faced, coursed ashlar limestone with smooth limestone accents. Building heights are typically 1-3 stories.

The organization of buildings masses defines a variety of outdoor spaces. The campus perimeter is distinguished by low stone walls and gateway elements.

Mid-Campus Zone

The Mid-Campus zone is generally defined as the campus north of Claflin Road and South of Kimball Avenue. Many of the buildings in this area were constructed from post WW II through the late 1970’s. The organization of the buildings reflects this era of development and is less dense than the historic core. Thus the mid-campus zone differs in spatial qualities found in the historic core.

Building masses and architectural styles are also more varied in this area but many buildings use the same or similar limestone material as is used in the historic core. This creates a cohesive aesthetic and a degree of continuity between zones.

North Campus Zone

The North Campus zone is generally defined as the area north of Kimball Avenue. Building use is predominantly agricultural (education, research, and innovation) and office (KSU Foundation Office Park under construction). Buildings have a broader range of construction materials than the rest of campus, but are generally unified through the selection of color.

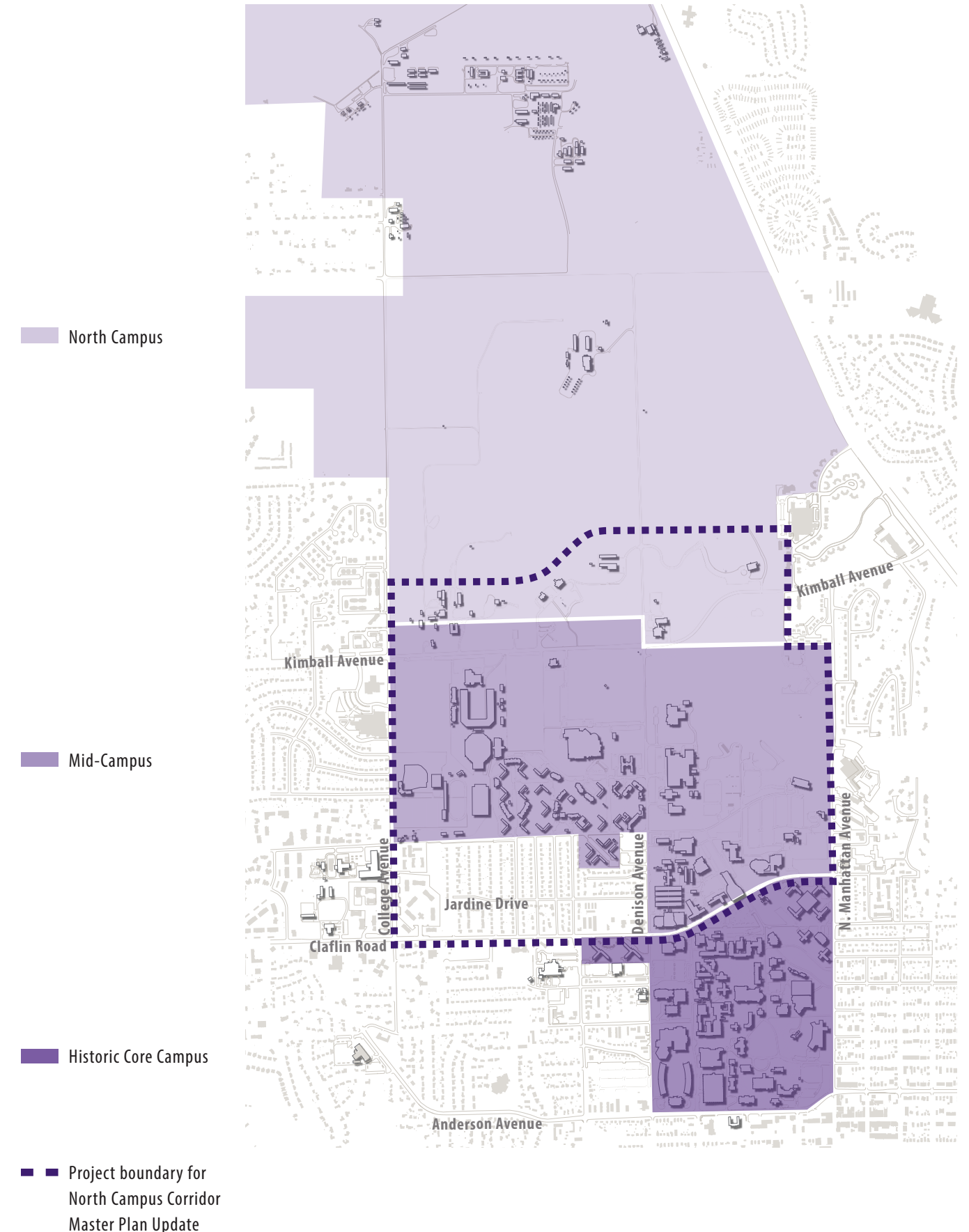
For this update, North Corridor Campus Plan zone is defined as:

Areas facing Kimball Avenue to the north; College Avenue to the west; North Manhattan Avenue to the east, and; Claflin Road to the south.

INTENT

The intent of these design guidelines is to build upon previously adopted design standards of the Kansas State University Master Plan Update 2012.

Recommendations blend the criteria of both the Mid-Campus and North Campus zones of Campus Master Plan Update.



NORTH CAMPUS CORRIDOR	
CHARACTERISTICS	
PREDOMINANT LAND USE	Agricultural Teaching Research Student Life (Residential & Recreational) Athletics Office
INTENDED LOOK & FEEL	Park like campus Rural (agricultural uses)
MASSING AND SPATIAL ORGANIZATION	
ALLOWABLE HEIGHT	No Height limit
SPATIAL ORGANIZATION	
Open Space	<p>Establish or maintain refined agricultural or natural settings for barns, agricultural research facilities, and out buildings.</p> <p>Create hierarchy of formal and informal open spaces for gathering, recreation, special events, and as an organizational element for buildings.</p> <p>Athletic facilities: Create clear and logical circulation paths to major venue entrances from large scale parking areas and adjacent zones.</p> <p>Locate new buildings in a manner for pedestrians to transition through a sequence of outdoor paces or quadrangles.</p>
Placement & Orientation	<p>Cluster buildings as functionally appropriate to create wind breaks, service yards, and required adjacencies.</p> <p>Promote building orientation to optimize solar lighting and solar gain for energy efficient design.</p>

NORTH CAMPUS CORRIDOR	
MASSING & SPATIAL ORGANIZATION (CONTINUED)	
SPATIAL PLANNING CONCEPTS	<p>Enhance spatial and pedestrian quality by relocating parking lots to campus perimeter, development of mixed-use parking structures, removing internal streets and strategic placement of new buildings.</p> <p>Prioritize agricultural zones for agricultural programs which incorporate interdisciplinary education, research, innovation or outreach in agriculture.</p> <p>Promote compact, dense campus enclaves, with departmental adjacencies, destination qualities and identity for:</p> <ul style="list-style-type: none"> Agronomy Campus Milling Science Campus Athletics/Vanier Complex KSU Research Park KSU Foundation Office Park Student Life Campus/Peters Recreation Complex Student Life/Residential Veterinary Medicine Campus

NORTH CAMPUS CORRIDOR	
GENERAL BUILDING DESIGN	
CHARACTER & IMAGE	Architectural sizes may vary but continuity of the established campus should be preserved through incorporating a predominance of limestone and glass exterior wall finishes and comparably colored roofing material.
ACCESSIBILITY	<p>All new construction must comply to ADA (Americans with Disabilities Act) and other required codes.</p> <p>Strategically place and locate accessible spaces to provide the best possible convenience to facility access.</p> <p>Consider placing classrooms and labs that have high utilization at the ground level and/or lower levels to accommodate classroom changes.</p> <p>Provide accessible parking and unloading spaces for agricultural facilities and access to research areas.</p> <p>Ensure multi-modal stations/shelters accommodate accessible needs.</p>
BUILDING MASSING	<p>Arrange multistory volumes to promote a sense of "place".</p> <p>Organize building massings to shape formal and informal outdoor spaces.</p> <p>Clearly define primary building entrances.</p>

NORTH CAMPUS CORRIDOR	
EXTERIOR FINISH, MATERIALS & COLORS	
EXTERIOR WALLS	<p>Natural limestone is the preferred primary exterior finish.</p> <p>A broader range of materials as complementary may be permitted that include:</p> <ul style="list-style-type: none"> • Limestone-colored cast and pre-cast concrete and other masonry products. • Limestone or warm medium gray metal panels, masonry, stucco or engineered wood, concrete or composite siding as secondary/accent materials with Campus Planning & Facilities Management (CP&FM) input and approval. <p>Exterior finish insulation system (EIFS) is discouraged and only allowed with (CP&FM) input & approval.</p>
ROOFING	<p>Visible sloping roofs should be a warm medium gray color similar to campus standard "Oxford Gray" architectural textured composition shingles.</p> <p>Campus standard MBCI "Ash Gray" color should be used for metal roofs on agricultural buildings .</p> <p>Strive to incorporate RoofPoint principles including durability, thermal discontinuity, energy efficiency, air barriers, daylighting, traffic protection, etc.</p>
GLAZING AND DOOR & WINDOW FRAMES	<p>Glass may range from clear to dark gray or bronze tones. Mirrored or colored glass is prohibited.</p> <p>Door and window frames may be clear anodized aluminum or gray/bronze tones.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS	
OUTDOOR SPACES	<p>Cluster buildings as functionally appropriate to create wind breaks and service yards.</p> <p>In addition to pedestrian accommodations, bike parking facilities shall be provided in approved locations.</p> <p>Consider appropriate landscape design for the intent of the space (turf, shade trees, native plant materials, annuals, perennials, irrigation, artwork, formal or informal landscape design). Consult adopted Kansas State University Landscape Guidelines.</p> <p>Incorporate places for people to gather in plazas and include benches, waste and recycling receptacles, bike parking, and lighting. Optional furniture may include tables, canopies or shade structures, and wayfinding/directory kiosk with Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
CAMPUS EDGE SETBACKS	<p>Kimball Avenue Building: 100' setback from Public Right of Way. Surface Parking: 25' setback from Public Right of Way.</p> <p>Denison Avenue Building: 50' setback from Public Right of Way. Surface Parking: 25' setback from Public Right of Way. Note: On the east side of Denison Avenue, from Jardine Drive to Kimball Avenue, a 75' surface parking setback should be maintained to accommodate the North Campus Esplanade concept.</p> <p>College Avenue Building: 100' setback from Public Right of Way. Surface Parking: 25' setback from Public Right of Way.</p> <p>North Manhattan Avenue Building: 50' setback from Public Right of Way. Surface Parking: 25' setback from Public Right of Way.</p> <p>As streetscape designs are undertaken, the design process should be coordinated with Campus Planning & Facilities Management (CP&FM) and the City of Manhattan for input to ensure pedestrian/bicycle, transit, limestone walls/fencing applications, gateways, stormwater management, utilities and landscape is implemented at the highest level of quality and meet the aspirations of the North Campus Corridor Plan.</p> <p>Deviations or variances to these setback standards may be considered to accommodate larger campus building goals, but must have Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
LANDSCAPING	<p>Provide thoughtful selection of trees, shrubs, native grasses and plant materials, perennial and annual materials to enhance the campus aesthetic and climatic environment.</p> <p>Pursue a native landscape palette that minimizes the need for irrigation.</p> <p>Consult the adopted Kansas State University Landscape Guidelines.</p>
EXTERIOR LIGHTING	<p>Adopt a common pedestrian and light standard for the campus.</p> <p>Work with the City of Manhattan to incorporate campus lighting standards along public streets that engage the campus environment.</p> <p>Pedestrian walk and street lighting shall be illuminated to EIS standards and conform and conform to adjacent fixture and pole styles.</p> <p>Parking lot and other security lighting shall be illuminated according to EIS standards and incorporate night sky and cutoff features.</p> <p>When possible, combine vehicular and pedestrian light fixtures to reduce the number of poles and reduce visual clutter. When feasible consider affixing wayfinding and other signage systems to lighting standards to further reduce visual clutter.</p> <p>LED fixtures are preferred. High pressure sodium fixtures are not permitted.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
DUMPSTERS, GROUND-MOUNTED INFRASTRUCTURE & EQUIPMENT	<p>Placement and design of service areas, waste dumpsters, recycling receptacles, and ground-mounted equipment such as transformers, generators, cooling towers, condensing units and so on must be Must be coordinated and approved by the University Landscape Architect and Campus Planning & Facilities Management (CP&FM). Incorporate landscape and fencing to screen service areas. No overhead utilities permitted.</p> <p>Relocate overhead utility to underground, when feasible.</p>
SITE FURNITURE	<p>Develop and adopt standards for campus site furnishings. Provide a consistency in color and material for benches, waste receptacles.</p>
WALLS & FENCING	<p>Incorporate low limestone walls, black steel metal picket fencing with limestone columns, as appropriate, as part of the campus design vocabulary along public streets that engage along and through the campus (per recommendations of the plan).</p> <p>Replace chain link fencing with black steel metal picket fencing with limestone columns (per recommendations of the plan).</p> <p>Functionally appropriate fencing types are permitted for animal containment with Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
GATEWAYS & ENTRY FEATURES	<p>Refer to Signage and Wayfinding Guidelines available from Campus Planning & Facilities Management for identification, directional and directory signage systems. The following are exceptions:</p> <ul style="list-style-type: none"> • Gateways. Incorporate recommended gateway hierarchy as recommended by the North Campus Corridor Plan 2015. • Gateways to include signage system that identifies “Kansas State University” and; “Founded 1863” for university gateways. • Gateways may incorporate a variety of elements, as outlined in the gateway “kit of parts”, per the 2015 North Campus Corridor Plan. <p>Coordinate with the City of Manhattan on gateways along public streets to ensure sight lines and other traffic safety standards are met.</p> <p>Gateways and signage systems at entrances to remote buildings or complexes may be at a larger scale to permit readability from greater distances in faster moving vehicles.</p> <p>Powercat logo should be utilized only for athletic and recreation complex facilities and sites.</p> <p>All signage must have Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
SIGNAGE	<p>Refer to Signage and Wayfinding Guidelines available from Campus Planning & facilities Management for identification, directional and directory signage systems, with exception to:</p> <ul style="list-style-type: none"> • Campus directory kiosk. Implement new standard as recommended by the 2015 North Campus Corridor Plan. • Building Signs. Incorporate limestone color concrete base (rather than steel frame) for building identification signs. • Partnership Gateways. Allow for interchangeable tenant signage panel for multi-tenant buildings that may developed in the KSU Foundation Office Park and the Research Park, These signage panels are secondary, with the primary signage system identifying the larger destination (Office and Research Park). <p>Powercat logo should be utilized only for athletic and recreation complex facilities and sites.</p> <p>All signage must have Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CAMPUS CORRIDOR	
SITE & GROUNDS (CONTINUED)	
STORMWATER MANAGEMENT	<p>Promote an interlocked system which accommodates the quantity and quality of runoff such that there is no increase in stormwater runoff from the campus.</p> <p>Undertake a comprehensive stormwater study and management plan to specifically address the appropriate solutions for the campus in the future. These best management practices and solutions may include, but are not limited to:</p> <ul style="list-style-type: none"> • Green roofs • Rainwater gardens • Cisterns • Underground cisterns/detention • Permeable pavement • Detention basins • Bioswales <p>Coordinate with the City of Manhattan on proposed stormwater initiatives.</p> <p>Implement the “Campus Creek” concept as part of the stormwater management plan.</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION	
MULTI-MODAL TRANSPORTATION	<p>Provide sidewalk and bicycle infrastructure to promote and encourage walking and bicycle riding along transportation corridors.</p> <p>Provide bicycle parking facilities in locations that are coordinated with bicycle routes, transit stops and campus destinations.</p> <p>Develop a unified campus standard for transit shelters. Transit shelters should be designed in a manner that are accessible, visible, lighted, offer a measure of weather protection, and incorporate compatible materials that further the campus aesthetic. This may include limestone, limestone-colored cast and pre-cast concrete, other masonry products, and limestone or warm medium gray metal panels. Other materials may be considered, however, final design must be approved by Campus Planning & Facilities Management (CP&FM).</p> <p>Ensure transit shelters accommodate accessible needs.</p> <p>Provide wayfinding and/or campus directory kiosk at transit shelter locations.</p> <p>Provide transit shelters at recommended locations per the North Campus Corridor Plan. Coordinate with the Area Transportation Authority to ensure a higher degree of connectivity among the campus and the City of Manhattan.</p> <p>Incorporate North Campus Corridor Master Plan recommendations to minimize conflicts between pedestrians and moving vehicles.</p> <p>Transit shelter design and locations must have Campus Planning & Facilities Management (CP&FM) input and approval.</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
PARKING	<p>Screen parking areas with plant materials according to the landscape guidelines.</p> <p>Incorporate best management practices for paving materials and stormwater management. Each parking area may have its own unique application, and should be addressed on a project-by-project basis (furthering recommended campus-wide stormwater management strategies).</p> <p>Parking areas should be appropriately illuminated to provide a measure of safety and security (refer to EXTERIOR LIGHTING GUIDELINES).</p> <p>For mixed-use parking structures, natural limestone is the preferred primary exterior finish.</p> <p>A broader range of materials as complementary may be permitted that include:</p> <ul style="list-style-type: none"> • Limestone-colored cast and precast concrete and other masonry products. • Limestone or warm medium gray metal panels, masonry, stucco or engineered wood, concrete or composite siding as secondary/accent materials with Campus Planning & Facilities Management (CP&FM) approval. <p>Exterior finish Insulation System (EIFS) is discouraged and only allowed with (CP&FM) approval.</p> <p>The ground floor of mixed-use parking structures that are designed for occupied space should have a mostly transparent facade. Glass may range from clear to dark gray or bronze tones. Mirrored or colored glass is prohibited.</p> <p>Door and window frames may be clear anodized aluminum or gray/bronze tones.</p> <p>Roof tops of mixed-use parking structures may be designed for parking, recreation space (with appropriate safety features or green roofs for stormwater mitigation and management).</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
STREETS	<p>Future Right-of-Way (ROW) expansion to 120' section.</p>
KIMBALL AVENUE <i>Prairie Ribbon Prototype</i>	<p>5 lane section (2 westbound and eastbound) moving traffic lanes with a center turn lane. Implement access management recommendations for a more efficient and safe traffic flow.</p> <p>Relocate all overhead utilities underground.</p> <p>Approximately 30' of amenity zone on both the north and south sides of Kimball Avenue. Within these zones, incorporate a 12' multi-use trail for pedestrians and bicyclist.</p> <p>Provide thoughtful selection of trees, shrubs, native grasses and plant materials, perennial and annual materials to enhance the campus aesthetic and climatic environment.</p> <p>Strategically cluster shade and ornamental trees.</p> <p>Pursue a native landscape palette that minimizes the need for irrigation. Incorporate native grasses, turf and other native plant materials bioswales and other best management practices into the final streetscape design.</p> <p>University vehicular and pedestrian lighting standards with optional seasonal/event/University banners.</p> <p>Incorporate Memorial Drive columns at access/egress points to the parking areas.</p> <p>Incorporate enhanced pedestrian crossings (pavers, colored concrete or other design applications) along Kimball Avenue at College and Denison Avenues, and future proposed signalization by the Intercollegiate Rowing Center/east stadium lot, with appropriate visual and audio crossing signalization.</p> <p>For game-day experience, additional enhanced crosswalks may be considered in front of the Vanier Football Complex.</p> <p>South side of Kimball Avenue, low limestone walls up to the Peters Recreation Complex athletic fields. Transition to limestone column with black metal picket fencing treatment (replacing chain link fence application).</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
STREETS	University gateway moments at the southeast corner of Kimball and College Avenues Vanier Complex, and Northwest corner of Kimball and Denison Avenues (KSU Foundation Office Park).
KIMBALL AVENUE CONT...	<p>Complementary gateway moments (optional) for College of Agriculture, Vanier Athletic Complex, KSU Foundation Office Park, and KSU Research Park.</p> <p>Signage moments for Bill Snyder Family Stadium, Bramlage Coliseum, Agronomy Education Center, Wheat Innovation Center, Multi-Tenant for KSU Foundation Office Park, and Intercollegiate Rowing Center.</p> <p>Consult adopted Kansas State University Landscape Guidelines.</p> <p>Final streetscape design must be approved with Campus Planning & Facilities Management (CP&FM) input and review.</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
STREETS	On the east side, create a tree allée, with double row of shade trees that in effect, creates a linear park between Kimball Avenue and Claflin Avenue.
DENISON AVENUE <i>North Campus Esplanade Prototype + Campus Prototype</i>	<p>3 lane section (1 northbound and southbound) moving traffic lanes with a center turn lane.</p> <p>East side: North CAMPUS ESPLANADE PROTOTYPE 10' green zone from curb to trail with shade trees and accommodate University lighting standards, a 12' multi-use trail, with the remaining areas for tree plantings to create the formal tree allée.</p> <p>Coordinate design with NBAF to ensure security metrics are met for the portion of the North Campus Esplanade that fronts the facility are met.</p> <p>West side: CAMPUS PROTOTYPE: Campus prototype with a 5' to 8' sidewalk and the remaining green zone from sidewalk to curb to accommodate tree plantings, University lighting standards, and Intermittent Bio - Detention Areas.</p> <p>Provide thoughtful selection of trees, shrubs, native grasses and plant materials, perennial and annual materials to enhance the campus aesthetic and climatic environment.</p> <p>University gateway moment at Denison Avenue and Jardine Drive and Denison Avenue and Kimball Avenue.</p> <p>Complementary gateway moments (optional) for College of Veterinary Medicine and Peters Recreation Complex.</p> <p>Signage moments for University Gardens, Veterinary Medicine facilities, Jardine Student Life, Mike Goss Tennis Center, Peters Recreation Complex, and Bramlage Coliseum.</p> <p>Consult adopted Kansas State University Landscape Guidelines.</p> <p>Final streetscape design must be approved with Campus Planning & Facilities Management (CP&FM) input and review.</p>

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
STREETS	8' Sidewalk Width.
JARDINE DRIVE, CLAFLIN ROAD AND KSU RESEARCH PARK + DENISON AVE (WEST SIDE) <i>Campus Prototype</i>	5' Landscape Zone Between Curb and Walk with Native Prairie Grasses, Turf and Intermittent Bio - Detention Areas.
	University lighting standards.
	Ornamental & Shade Tree Clusters where appropriate.
	Optional: Low limestone walls and black metal picket fencing with limestone columns (where appropriate).
	Enhanced pedestrian crosswalks along Denison Avenue at Claflin Road, Jardine Drive and Kimball Avenue.
	University gateway moment at Jardine Drive and Denison Avenue.
	Complementary gateway moments (optional) for College of Veterinary Medicine and College of Agriculture.
	Consult adopted Kansas State University Landscape Guidelines.
	Final streetscape design must be approved with Campus Planning & Facilities Management (CP&FM) input and review.

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
STREETS	Landscape Zone Between Curb and Walk with Native Prairie Grasses, Turf and Intermittent Bio - Detention Areas - width will vary.
NORTH MANHATTAN AVENUE <i>Campus East Perimeter Prototype</i>	West side of North Manhattan Avenue: Preserve established woodlands that provide a green buffer from Jardine Drive to the KSU Research Park.
	8' Sidewalk Width.
	Relocate all overhead utilities underground.
	University lighting standards.
	Ornamental & Shade Tree Clusters.
	Low limestone walls.
	Enhanced pedestrian crosswalks along North Manhattan Avenue at Claflin Drive and Jardine Drive.
	University gateway moment at North Manhattan Avenue and Jardine Drive.
	Complementary gateway moments (optional) for KSU Research Park.
	Signage moments for KSU Research Park.
	Consult adopted Kansas State University Landscape Guidelines.
	Final streetscape design must be approved with Campus Planning & Facilities Management (CP&FM) input and review.

NORTH CORRIDOR CAMPUS	
CIRCULATION (CONTINUED)	
<p>STREETS</p> <p>COLLEGE AVENUE <i>Campus West Perimeter Prototype</i></p>	<p>Landscape Zone Between Curb and Walk with Native Prairie Grasses, Turf and Intermittent Bio - Detention Areas - width will vary.</p> <p>8' Sidewalk Width.</p> <p>Relocate all overhead utilities underground.</p> <p>University lighting standards.</p> <p>Shade trees and low shrubs and plantings to mitigate visual scale of the west lot from the public realm.</p> <p>Optional: Low limestone walls and black metal picket fencing with limestone columns (where appropriate).</p> <p>Enhanced pedestrian crosswalks along College Avenue at Kimball Avenue and Jardine Drive. A secondary crossing may be considered, near the location of the Hospital drive for game-day events.</p> <p>University gateway moment at College Avenue and Kimball Avenue.</p> <p>Complementary gateway moments (optional) Vanier Athletic Complex.</p> <p>Signage moments for Bill Snyder Family Stadium, Bill Snyder Family Stadium, West Stadium Center; Vanier Football Complex, Bramlage Coliseum and Basketball Training Facility, Tointon Family Stadium; John Allen Strength Center, Brandeberry Indoor Facility and R.V. Christian Track Complex.</p> <p>Consult adopted Kansas State University Landscape Guidelines.</p> <p>Final streetscape design must be approved with Campus Planning & Facilities Management (CP&FM) input and review.</p>

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SIGNAGE AND WAYFINDING

The following signage and wayfinding recommendations build on the 2012 Campus Master Plan Update. New and modified proposals reinforce current campus wayfinding and signage systems. They also support university goals of creating a campus environment that is easy to navigate, accommodates future development, and has a cohesive aesthetic through the North Campus Corridor.

For a complete description for campus wayfinding refer to the *Signage & Wayfinding Master Plan - Fall 2012*.

Wayfinding in the North Campus Corridor

These recommendations are developed to reinforce current wayfinding and signage systems. They also further the goals of creating a campus environment that is easy to navigate, accommodates future development, and extends a cohesive aesthetic in the North Campus Corridor.

Based on this input, revised concepts have been developed for sign types:

- Directory Kiosk
- Building Identification
- Gateway

Standards from the Kansas State University Campus Master Plan Update and Signage and Wayfinding Master Plan of 2012 to be implemented in the North Campus Corridor are:

- Street Signs
- Large Vehicular Directional
- Small Vehicular Directional
- Vehicular Trailblazers

Definitions

Signage

Signage refers to the system of signs on campus that direct navigation through the environment. Signage provides orientation and direction, and identifies destinations.

Wayfinding

Wayfinding is the sum of all visual and informational cues that help users understand where they are. Successful wayfinding uses multiple methods of communication to convey place-based information to users.

Guiding Principles from the Wayfinding & Signage 2012 Master Plan

Advanced Wayfinding

Use multiple wayfinding strategies. Signage is only one tool, wayfinding begins before a person arrives on campus. Advanced wayfinding information can inspire confidence, reduce anxiety, and help visitors navigate a new place more quickly and efficiently.

Strengthen identity

Promote the spirit and reputation of the University with signage that uses branded colors, typography, graphic style, and material. New signs should coordinate with the existing signage system, campus architecture and limestone site features.

Improve Navigation

Clarify navigation for students and visitors. Add directional signs to complement and supplement the existing sign system. Provide a consistent, logical, and extensible wayfinding system.

Clarify Circulation

Prescribe movement along preferred routes to instill user confidence and highlight campus assets. Use signage hierarchy to clearly distinguish between vehicular and pedestrian access and circulation.



Street Sign

Large Vehicular
DirectionalSmall Vehicular
Directional

Vehicular Trailblazer

Vehicular Signage Family

Street Signs

Inter-campus street signs identify roads within the campus boundary. They help regulate vehicular traffic movement and provide orientation for drivers. The proposed design retains the existing sign structure and updates the message panel.

Large Vehicular Directional

Large vehicular directional signs are located on University property along the campus perimeter (where space and sight lines permit) and outside of the City of Manhattan public right-of-way. They provide a strong sense of arrival and give guidance to primary campus destinations such as the Athletics Complex, Parking Garage, and Veterinary Medicine.

Small Vehicular Directional

Small vehicular directional signs are located on University property along the inter-campus roadway network where travel speeds and road complexity are reduced. They may also be used in the southern portion of the campus perimeter where traffic patterns permit. Signs must be placed outside of the City of Manhattan public right-of-way.

Vehicular Trailblazers

Trailblazers announce immediate turns to major destinations and confirm motorist routes. This sign typology is successful in areas with minimal space for signs - they may be installed as freestanding signs or mounted on existing posts.

Pedestrian Signage Family

Map Kiosk

The pedestrian map kiosks are typically the first signs visitors will encounter after parking and leaving their vehicles. This proposed sign type retains the existing sign structure: contained within the unit is a “You Are Here” map of the campus, a contact number for the Security and Traffic Information desk, and other directory information to help acclimate visitors to the campus. Kiosks should be used in parking facilities, drop off locations, transit stops, key intersections, and gathering places. They should also be placed along primary pedestrian routes to supplement directional signs.

Map Kiosk Standard

The current pedestrian map kiosk standard is an ornamental fabricated steel post and frame, with painted finishes and a decorative base.

In the North Campus Corridor Planning Process, concerns of durability and maintenance were identified by stakeholders.

Description

The intent of pedestrian map kiosk signs is to provide students and visitors a location reference and to identify campus destinations.

Construction & Component Recommendations

- Map kiosk will be fabricated aluminum construction with painted finishes
- Includes a smooth cast-in-place concrete base with limestone appearance
- Incorporates an easily readable and user-friendly map pane

Legibility Recommendations

- All symbols and copy will be reflective
- Map cabinet should be removable so it can be readily updated
- Primary typeface, excluding any other branded material will be Myriad Pro
- Each kiosk should contain a map of the Kansas State

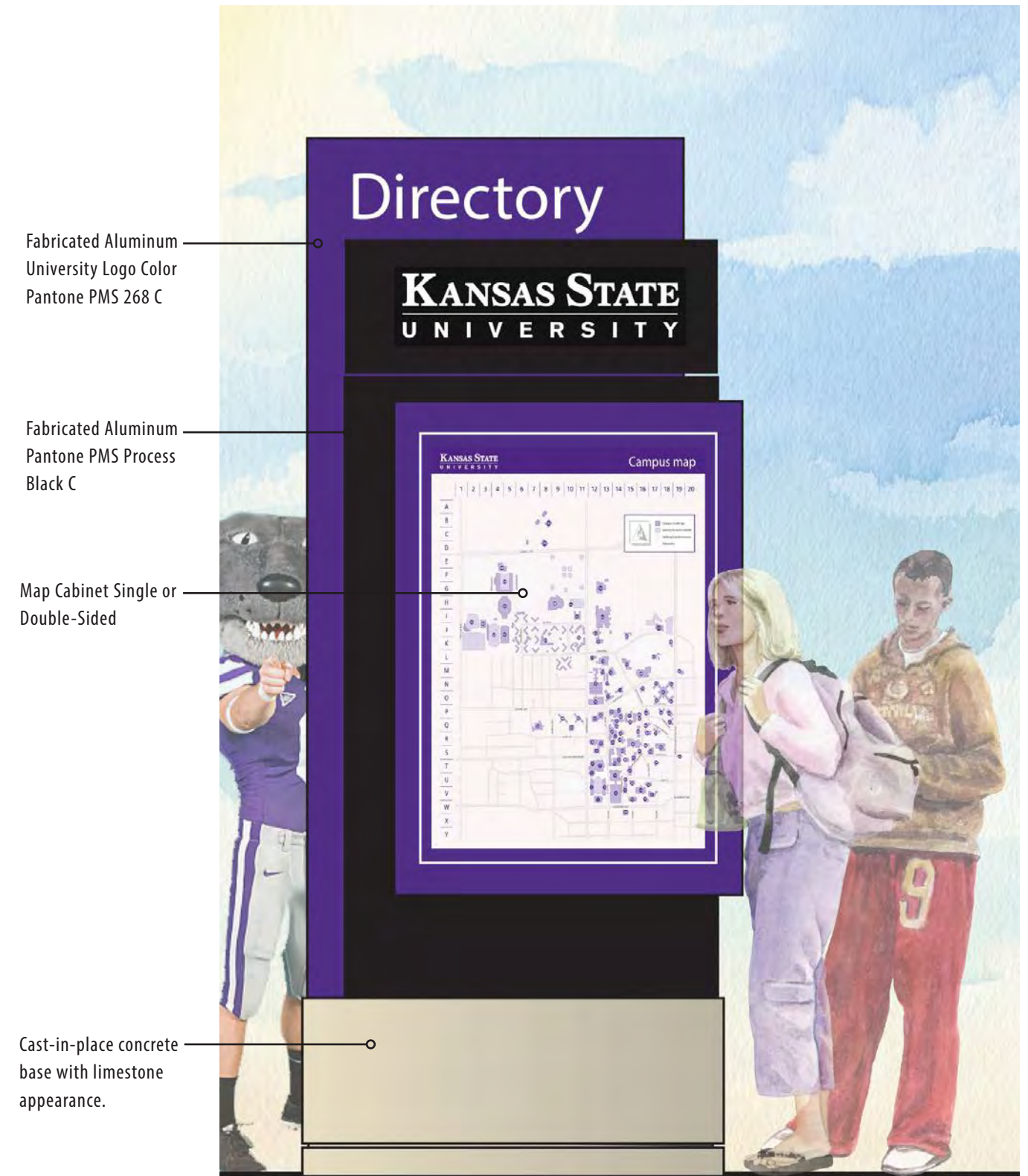
University campus identifying all buildings, monuments and other significant campus elements. Sign panel may be single or double-sided

- Campus maps will include a “You are Here” location reference
- Kiosks should include contact information for campus security and traffic information
- An additional panel or schedule caddy may be included on the map kiosk to hold transit information such as schedules and routes for Kansas State University and the ATA (Flint Hills Area Transportation Agency, servicing the greater Manhattan area)

Placement

Map kiosks signs may be placed in high visibility locations: areas that tend to have a greater degree of convergence among people. These areas in the North Campus Corridor include, but are not limited to:

- Future transit stations/stops
- Kimball Avenue, in front of the Vanier Athletic Complex/Bill Snyder Family Stadium
- Bramlage Coliseum
- KSU Foundation Office Park
- KSU Research Park
- Chester E. Peters Recreation Complex
- Future Mixed-Use Parking Structures
- University Gardens
- Strategic locations along the Campus Creek greenway and pedestrian malls that have anticipated high volumes of pedestrian cross flow



Map Kiosk Standard: Concept Elevation

Building Identification

The building identification sign marks primary entrances to all University buildings and facilities. Uniform in design and with consistent relative placement these signs are a strong component of wayfinding because pedestrians intuitively understand where to look for names of buildings.

Building Identification Standard

The current building identification standard is a sign that consists of a smooth cut limestone slab. The slab is supported by a black metal frame. Signs are landscaped and edged with a mowing strip.

Recommendation: Implement a new standard that departs from the black metal frame with a concrete base to a concrete base with a limestone appearance.

Description

The building identification sign marks the entrance and arrival to all University buildings and facilities. Uniformly designed and consistently placed near entrances, these signs aid in wayfinding as pedestrians intuitively understand where to look for names of buildings.

Construction & Components Recommendations

- Sign consists of a smooth cut limestone slab
- Signs will have a smooth cast-in-place concrete base with limestone appearance
- Signs may be landscaped and edged with a mowing strip

Legibility Recommendations

- Primary typeface, excluding any other branded material will be Myriad Pro
- Signs may be double-sided

Placement

Signs should be placed a minimum of 3'-0" from pathways near the primary and major secondary entrances to the building the sign is identifying.

Additional Signage Systems

In some instances destination complexes may have additional signage. This may be incorporated into low limestone walls that are at the perimeter of a particular complex.

In other instances, large scale destinations may incorporate a larger signage system identifying the building. Given the scale of the building or site, it may require larger signage systems to provide legibility for vehicular traffic and be more contextual in scale. Candidate situation include:

- Bill Snyder Family Stadium
- Bramlage Coliseum
- Mike Goss Tennis Center
- Chester E. Peters Recreation Complex
- Tointon Family Stadium
- Intercollegiate Rowing Center
- The R.V. Christian Track Complex
- Future Soccer and competition Fields Complex
- Kansas Wheat Innovation Center
- Milling Science Complex
- Veterinary Medicine Complex
- Vanier Athletic Complex
- KSU Foundation Office Park
- KSU Research Park

For the KSU Foundation and the KSU Research Park, there should be additional flexibility in design. This specifically addresses the issue of interchangeable tenant signage systems to provide identity for tenants occupying structures within these institutional/research/office/commercial uses.

These additional signage systems should accommodate a measure of flexibility, creativity and uniqueness. They should consist of baseline standards to ensure visual continuity in the Kansas State University signage family.



Building Signage Standard :: Concept Elevation

Primary Material:

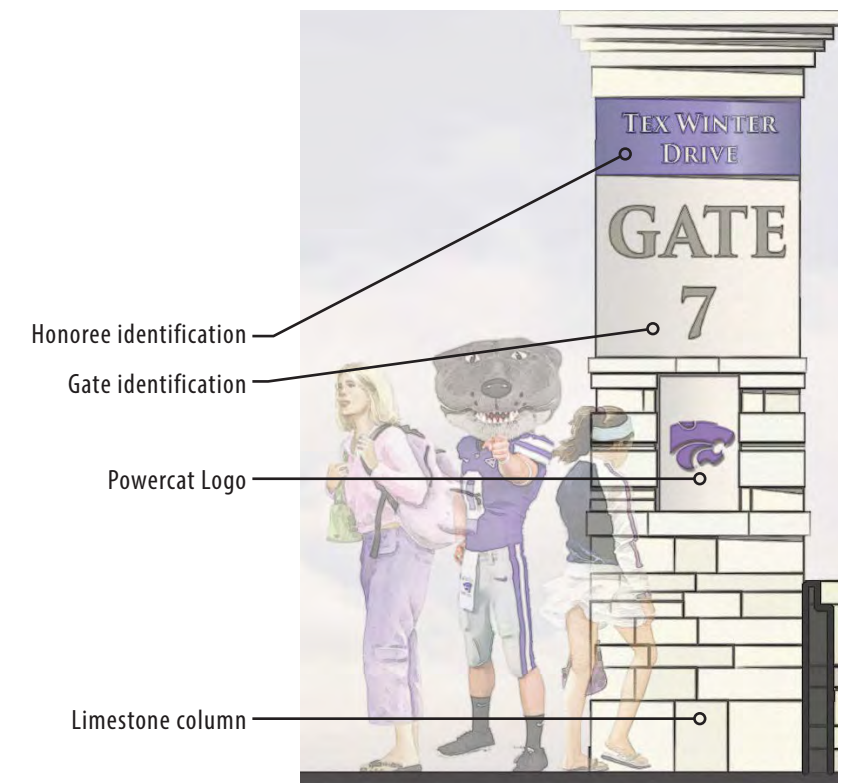
- Natural limestone is the preferred primary material

Complementary/secondary materials may include:

- Limestone-colored cast and pre-cast concrete and other masonry products
- Limestone or warm medium gray metal panels
- Additional Signage Systems need Campus Planning & Facilities Management (CP&FM) input and approval

At the Vanier Athletic Complex, an additional signage moment is intended to celebrate the "Memorial Drives".

The plan envisions limestone columns, gate and honoree identification.



Memorial Gateway Standard :: Concept Elevation

University Campus Gateways

The edges and entrances define the physical boundary and transition between campus and surrounding community. These gateway entrances can “celebrate” arrival to Kansas State University and create visually inviting experiences that provide a welcoming first impression to campus visitors.

There are a number of gateways on the perimeter of campus that signal arrival to a University visitor who is walking to campus or approaching in a vehicle. For the North Campus Corridor, several gateway locations are identified.

- Claflin Road & North Manhattan Avenue
- Claflin Road & Denison Avenue
- Jardine Drive & Denison Avenue
- Kimball Avenue and College Avenue
- Kimball Avenue and Denison Road

Kit of Parts

University gateways are inspired by the grand and ceremonial gateways already established on campus (Higginbotham and Peine Gates). Expanding this design to the North Campus Corridor is envisioned as a means to unify the Historic Core Campus, Mid-Campus and the North Campus zones.

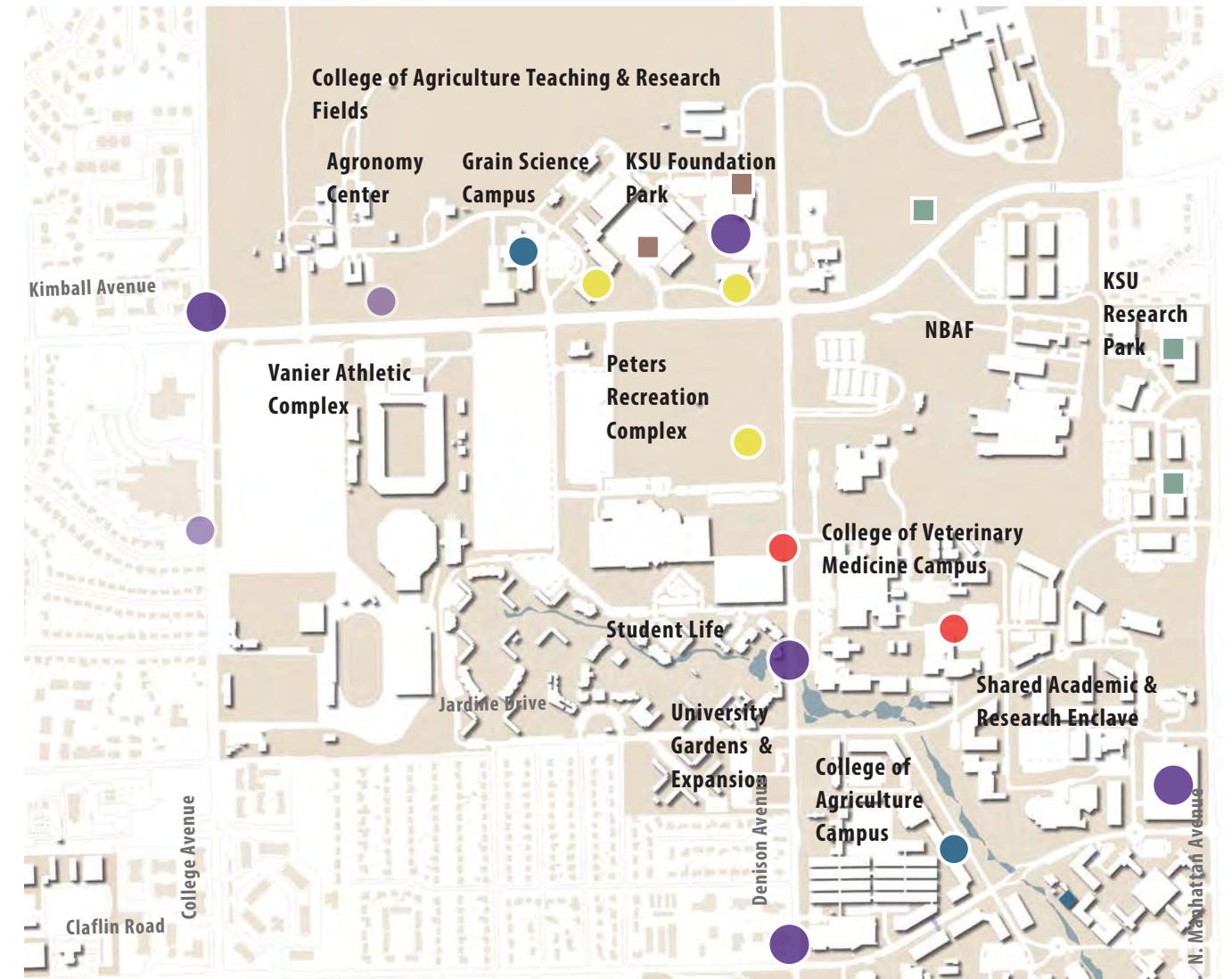
The gateway design provides baseline standards with additional options - kit of parts. This creates a degree of continuity among gateway experiences while creating flexibility to address site specific opportunities and constraints and budget resources.

Base Gateway Standard

- Limestone Wall
- Limestone or Pre-cast Limestone Color Concrete Cap and Accent
- Limestone or Pre-cast Limestone Color Concrete Signage Panel with KANSAS STATE UNIVERSITY
- FOUNDED 1863 type
- Limestone Columns, book ending gateway wall

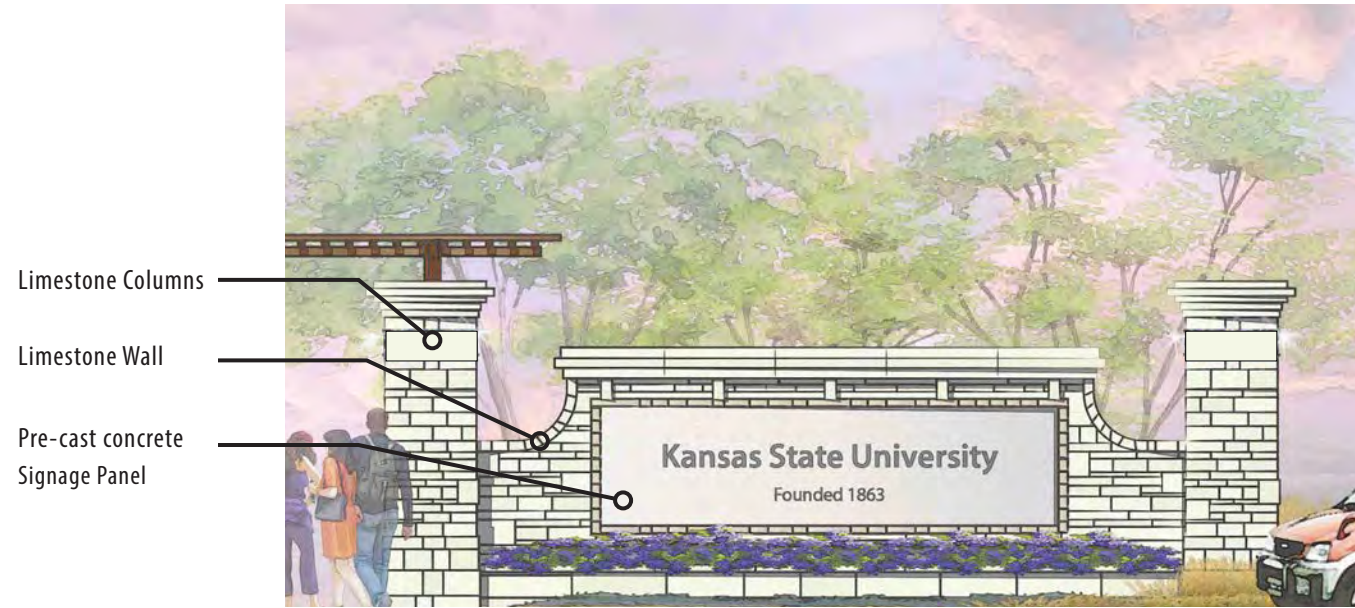
Kit of Parts Options

- Additional limestone column on either side or both sides to create a pedestrian portal with sidewalk
- Engineered wood or metal trellis to better define the pedestrian portal: cap and accent
- Internal lighting fixture in gateway columns
- External ornamental light fixtures on gateway columns
- Raised limestone planter wall in front of gateway wall
- Other accent lighting applications (e.g. ground mounted fixtures in planter bed and so on)
- Donor plaque
- Gateway may be tied into low limestone campus perimeter wall
- Limestone or pre-cast color concrete bench seating



Primary & Complementary Gateway Options: Concept Plan

- Primary: University Gateways
- Complementary: Athletics Complex Gateways or Signage Moment
- Complementary: College of Agriculture Gateway or Signage Moment
- Complementary: College of Veterinary Medicine Gateways Or Signage Moment
- Complementary: Recreation Complex Gateways or Signage Moment
- Complementary: KSU Foundation Office Park Gateways or Multi-Tenant Signage Moment
- Complementary: KSU Research Park Gateways or Multi-Tenant Signage Moment



Base Gateway Concept Features

University Complementary Gateways

To further celebrate specific destinations and places within the campus, complementary gateways may be considered.

Complementary gateways are essentially another option to larger scale signage systems, however, they provide additional branding and identity for specific enclaves within the campus. This hierarchy, plus a common standard, are the differentiators between complementary gateway and large-scale signage.

Complementary gateways options are envisioned for:

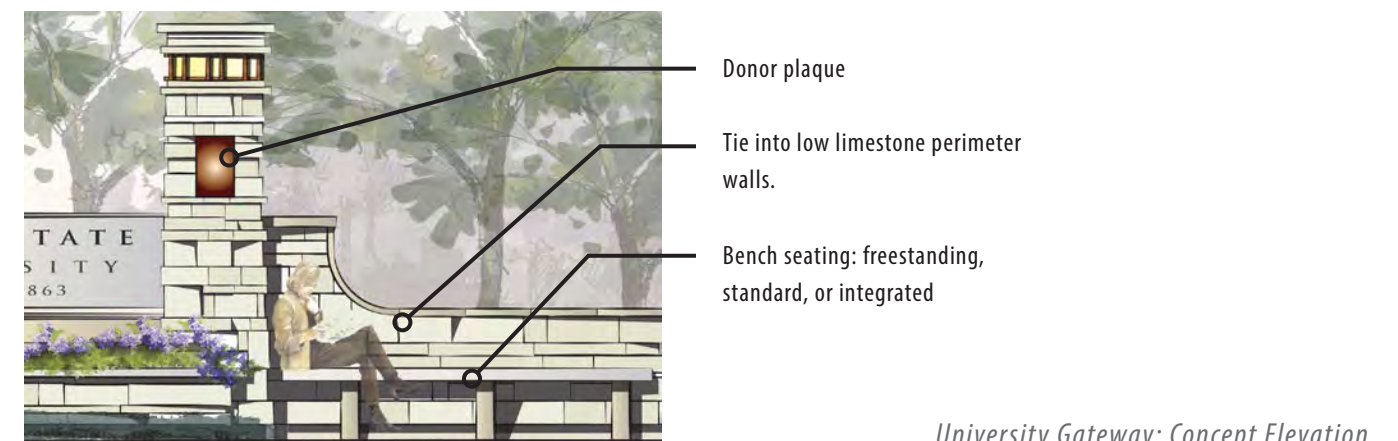
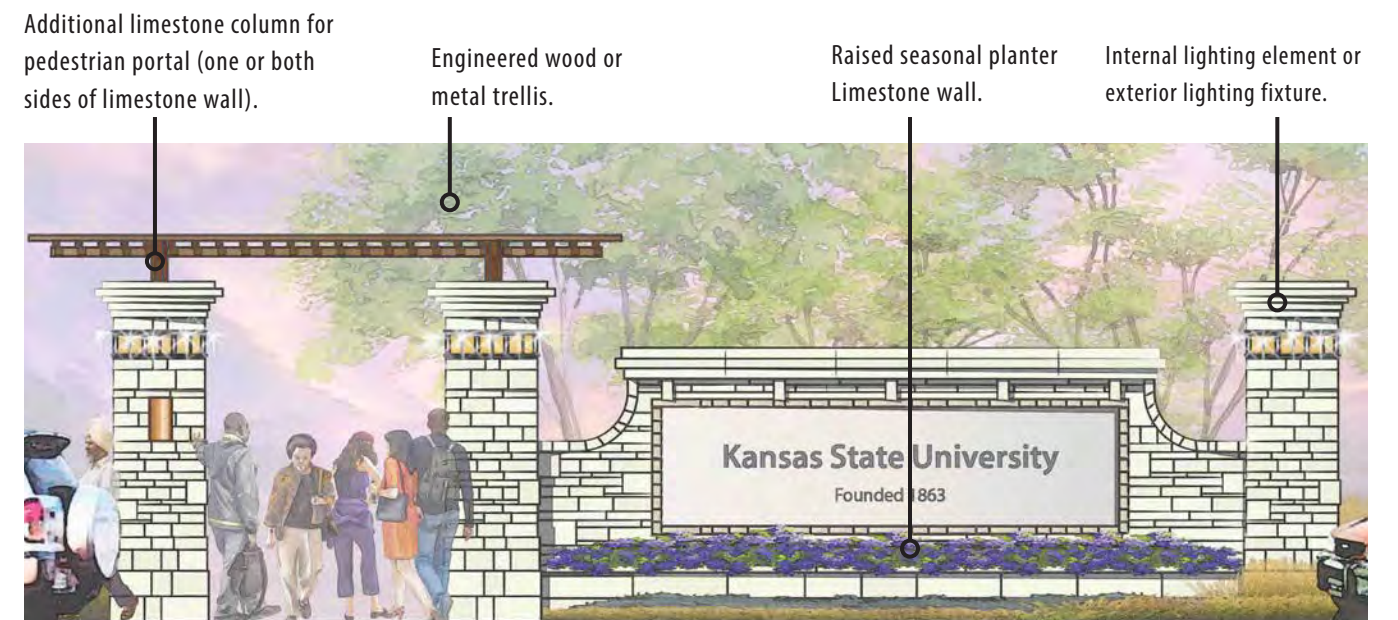
- College of Agriculture
- College of Veterinarian Medicine
- Vanier Athletic Complex
- Peters Recreation Complex
- KSU Foundation Office Park
- KSU Research Park

If possible, a similar standard should be developed with NBAF for a complementary gateway that will add to the campus-like environment at the Kimball and Denison Avenue gateway intersection.

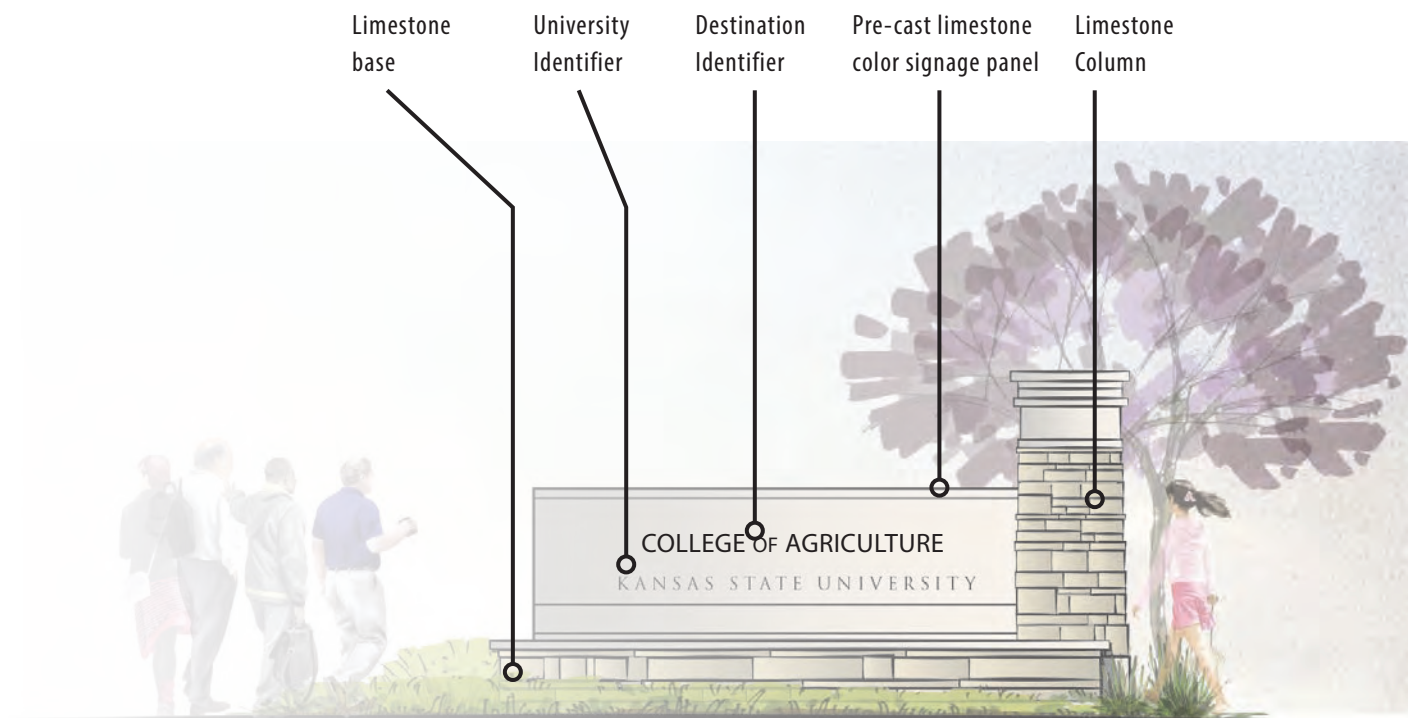
Complementary gateways should be consistent, with a predominance of limestone and pre-cast limestone colored concrete as the primary materials. Unlike larger signage systems, these additional signage systems adhere to an adopted standard to ensure visual continuity in the Kansas State University gateway family. These elements include natural limestone as the preferred primary material.

Complementary/secondary materials may include the following:

- Limestone-colored cast and pre-cast concrete and other masonry products
- Limestone or warm medium gray metal panels
- Additional Signage Systems need Campus Planning & Facilities Management (CP&FM) input and approval
- Identification hierarchy (see below)
- Primary destination Identification (Academic College, Complex or Designation)
- KANSAS STATE UNIVERSITY as the secondary identifier



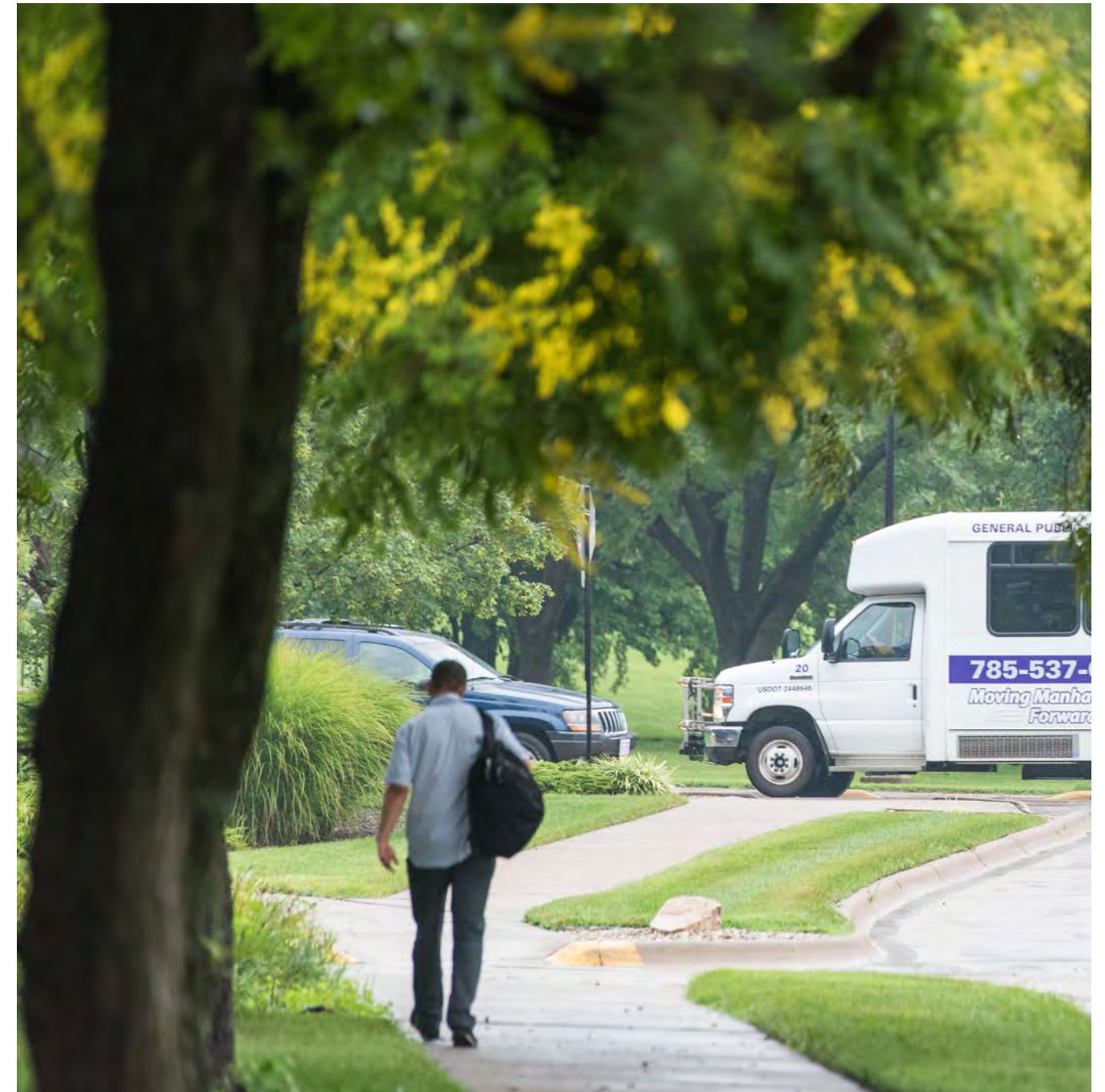
University Gateway: Concept Elevation



Perpendicular-to-Road Concept Elevation: One Column Option



Parallel-to-Road Concept Elevation: Two Column Option



STREETSCAPE FRAMEWORK

The streetscape framework creates concepts for campus perimeter and primary internal streets within the North Campus Corridor planning boundary. The design treatment of these streets will contribute to the campus' landscape aesthetic while providing another type of wayfinding, neighborhood amenities, and opportunities for stormwater management.

The treatment of the public realm along perimeter streets is particularly critical to interlace the campus within the City of Manhattan. These treatments acknowledge a more holistic approach to mobility, connectivity, and meaningful community-wide enhancements.

The streets addressed in this chapter include:

- North and south sides of Kimball Avenue, from College Avenue to Denison Avenue
- East side of College Avenue, from Kimball Avenue to Dickens Avenue
- North and south sides of Jardine Drive, from Denison Avenue threading through the campus and the KSU Research Park to North Manhattan Avenue
- East and west sides of Denison Avenue, from Claflin Road to Kimball Avenue
- North and south sides of Claflin Road, from Denison Avenue to North Manhattan Avenue
- East side of North Manhattan Avenue, from Claflin road to Kimball Avenue

In order to implement the comprehensive streetscape program, it will be necessary for all effected parties to come together in partnership to further the design, funding, and implementation.

Streetscape Concept

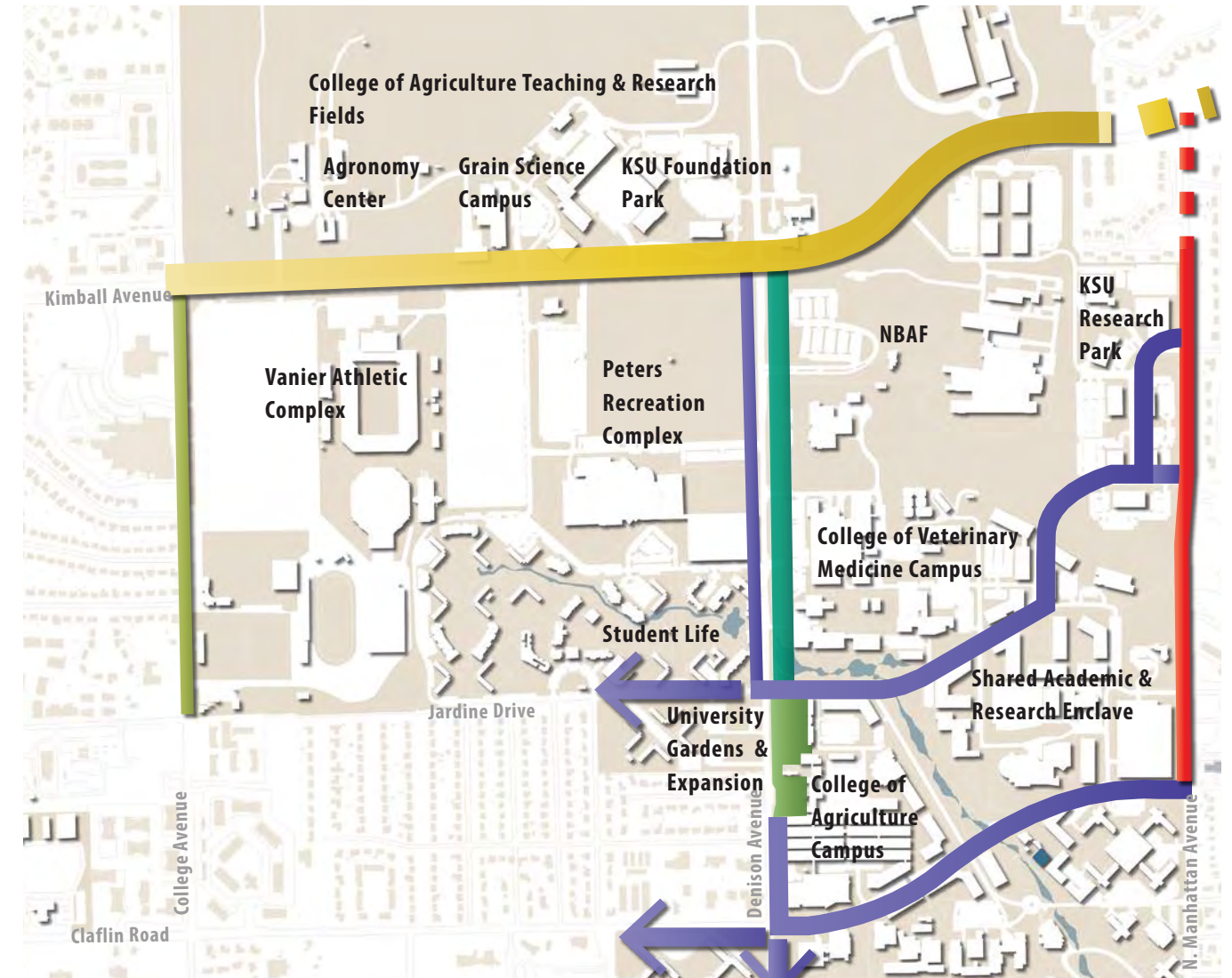
The streetscape concept is based on leveraging opportunities and making the most out of constraints. The intent is to create an aesthetically pleasing and performative campus "face" with high-quality public realm environments that respond to the growth and momentum the area is experiencing.

The streetscape framework is designed to complement other campus systems (signage, gateways, multi-modal transit recommendations, and future development). Within this cohesive platform the framework has diverse applications.

Streetscape Concept Principles

The streetscape concept for the North Campus Corridor area is intended to address the following goals:

- Provide clear, safe and efficient movement of pedestrian, bicyclists and motorists
- Establish a framework of multi-modal connectivity to, through and within the campus environment
- Create a rational and creative aesthetic that promotes the university brand, enhances the City of Manhattan and creates a quality experience
- Promote a higher level of pedestrian and bicycle mobility into the campus environment
- Promote best management practices that will contribute to future overall storm water management plans



Streetscape Prototypes

- █ Prairie Ribbon
- █ North Campus Esplanade
- █ Campus
- █ Campus East Perimeter
- █ Campus West Perimeter
- █ Campus West Perimeter

Kimball Avenue

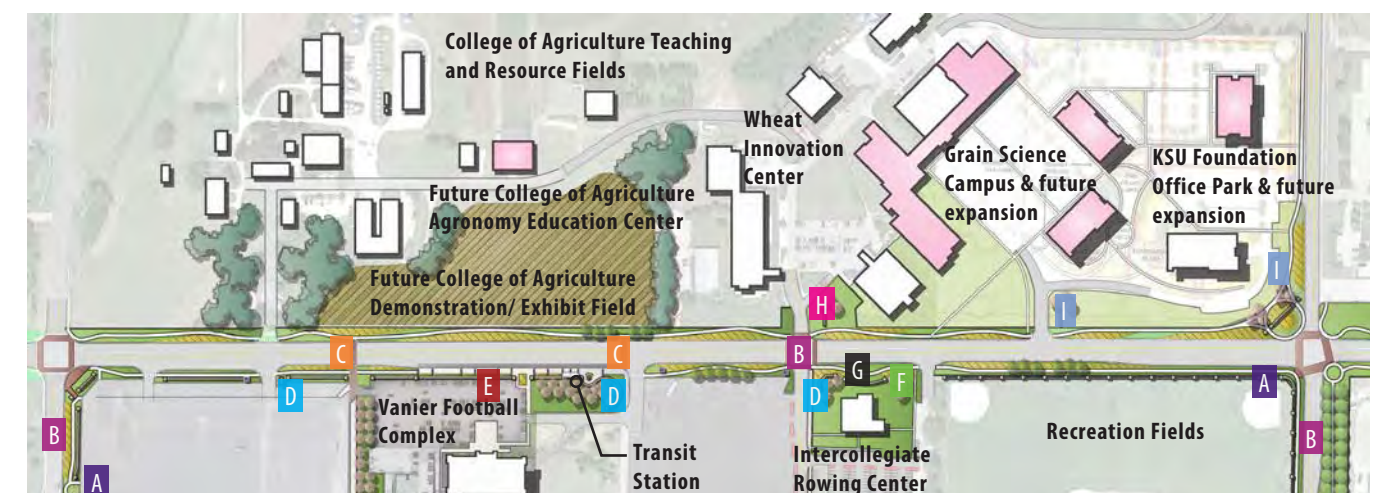
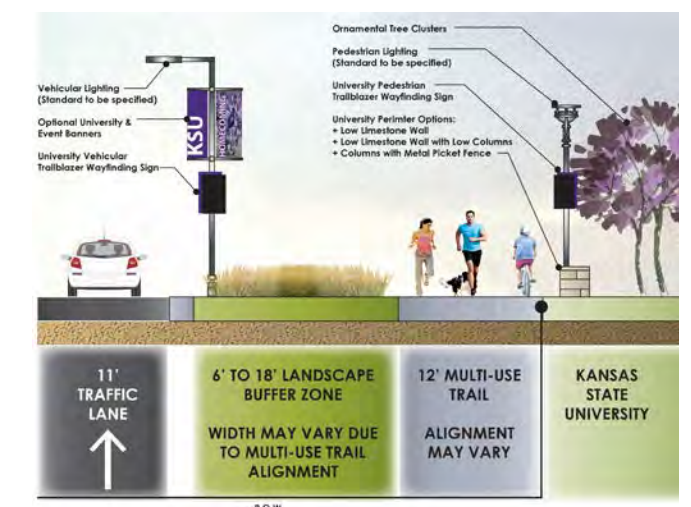
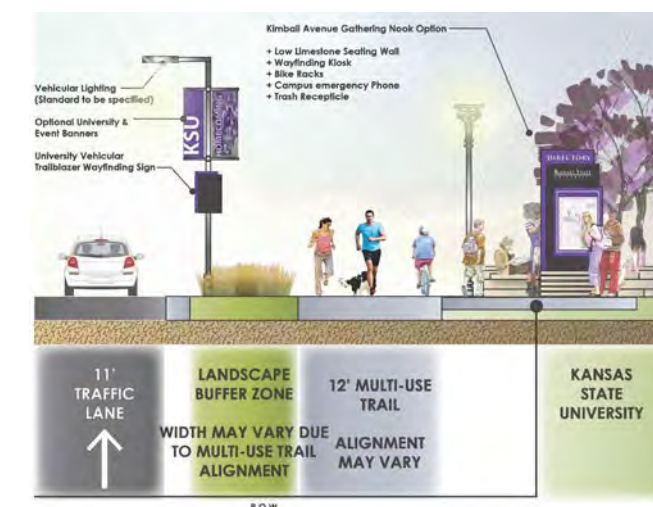
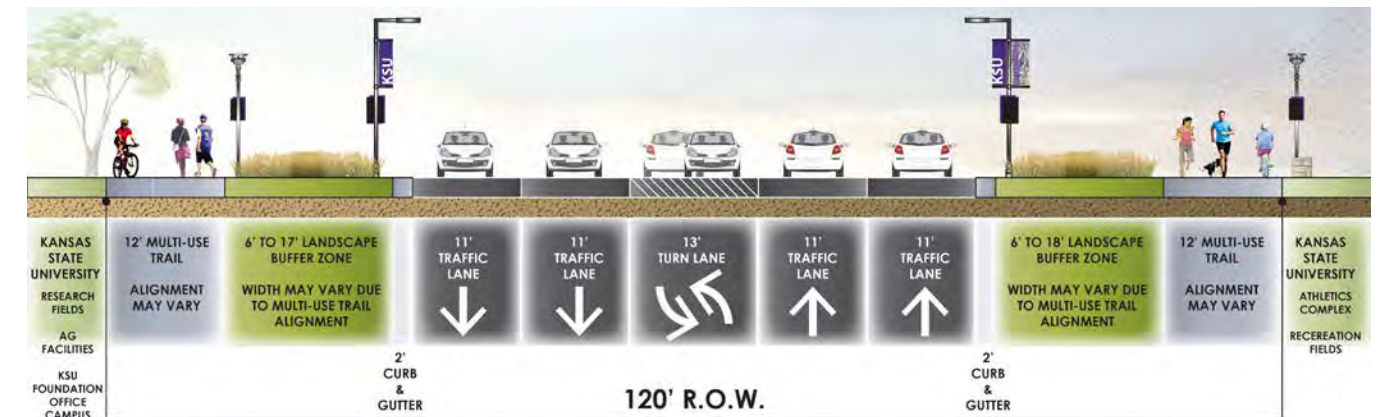
Concept: Bridge campus past and future.

The Prairie Thread Prototype: Weave native prairie ecosystems through the campus to express the roots of the land grant university. Refine and cultivate this prairie ecology to express the University's mission of innovation and leadership in research and development.

Features:

- Future Right-of-Way (ROW) expansion to 120' section
- 5 lane section with 4 (2 westbound and eastbound) moving traffic lanes and a center turn lane. Implement access management recommendations for a more efficient and safe traffic flow
- Relocate all overhead utilities underground
- Approximately 30' of amenity zone on both the north and south sides of Kimball Avenue. Within these zones, incorporate a 12' multi-use trail for pedestrians and bicyclists; develop detailed designs that include:
 - Native grasses, turf and other native plant materials bio-swales and other best management practices
 - Strategically clustered shade and ornamental trees
 - University vehicular and pedestrian lighting standards with optional seasonal/event/University banners
- Low limestone walls to reinforce the campus perimeter and aesthetic
- In front of the Vanier football complex, an additional right hand turn lane is recommended for the section profile. Within this location, the plan envisions a hardscape plaza in the ROW. Breaks in the proposed campus perimeter low limestone wall will provide pedestrian portal entrances and will be aligned with the pedestrian walls on both the east and west side of Bill Snyder Family Stadium
- At the east end of the plaza treatment, a transit shelter and gather nook is proposed. This will enhance mobility, accessibility and provide a gathering or "rally-point" for the game-day experience, as well as for the future park-and-ride opportunities in the east lot
- Memorial Drive columns at access/egress points to the parking areas
- Enhanced pedestrian crossings (pavers, colored concrete or other design applications) along Kimball Avenue at College and Denison Avenues, and future proposed

- signalization by the Intercollegiate Rowing Center/East Stadium lot, with appropriate visual and audio crossing signalization
- For game-day experience, additional enhanced crosswalks may be considered in front of the Vanier Football Complex
- Continue to thread low limestone walls up to the Peters Recreation Complex athletic fields. Transition to limestone column with black metal picket fencing treatment (replacing chain link fence application)
- The north side of Kimball Avenue is not envisioned to incorporate low limestone walls or fencing treatment
- University gateway locations at the southeast corner of Kimball and College Avenues Vanier Athletic Complex, and the northwest corner of Kimball and Denison Avenues (KSU Foundation Office Park)
- Complementary gateways (optional) for the College of Agriculture, Vanier Athletic Complex, KSU Foundation Office Park, and KSU Research Park
- Signage for Bill Snyder Family Stadium, Bramlage Coliseum, Agronomy Education Center, Wheat Innovation Center, Tenants at the KSU Foundation Office Park, and Intercollegiate Rowing Center



- A** Kansas State University Campus Gateway
- B** Primary enhanced pedestrian crosswalk across Kimball
- C** Secondary enhanced pedestrian crosswalk (painted striping)
- D** Gate/Memorial Drive Limestone column
- E** Limestone wall & Vanier Athletic Complex gateway or signage system
- F** Limestone wall & Recreation center gateway or signage system
- G** Limestone wall & Intercollegiate Rowing Center signage
- H** College of Agriculture gateway signage
- I** KSU Foundation/ partnerships gateway or tenant signage system

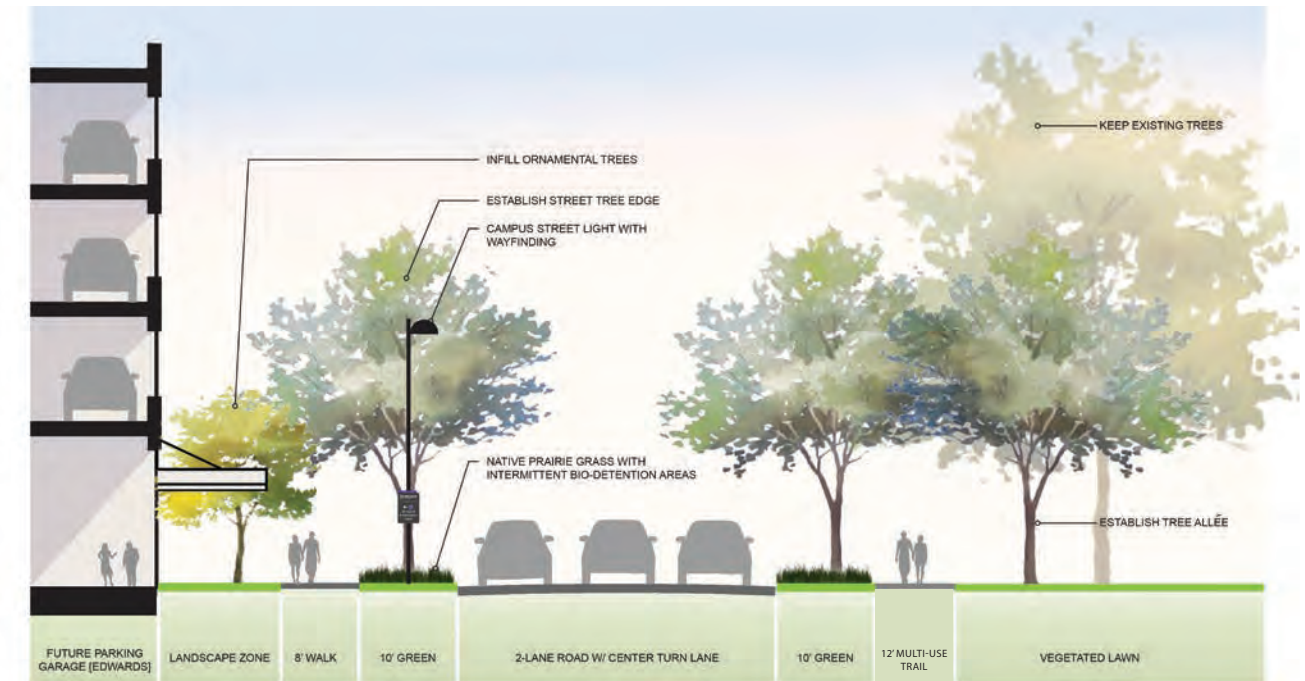
Denison Avenue

Concept: Strengthen the connection of the University as a whole.

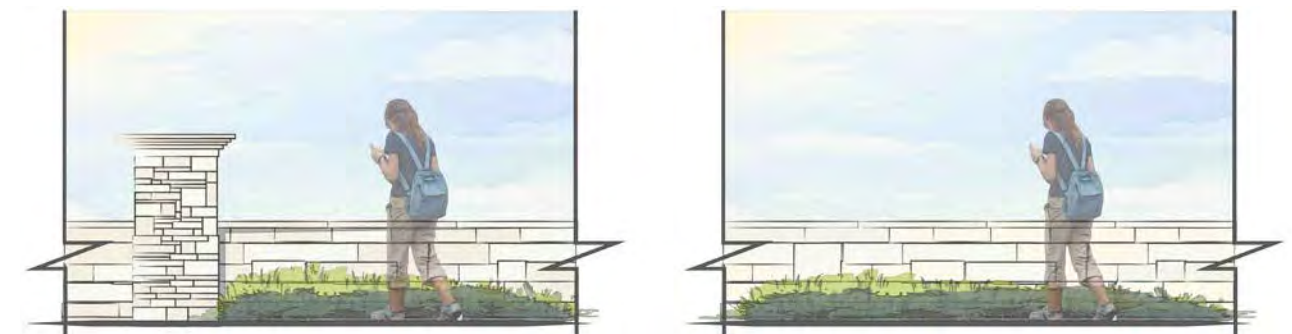
North Campus Esplanade Prototype : Create a formal green link that visually and functionally connects the North Campus Corridor to the Mid-Campus and Historic Core.

Kit of Parts:

- Utilize existing setback on east side of Denison to create a defined aesthetic and functional north-south campus link to enhance connectivity and mobility
- On the east side, create a tree allée, with double row of shade trees that in effect, creates a linear park between Kimball Avenue and Claflin Road. Philosophically, extend the Campus Gardens and Campus Creek green environment into the North Campus Corridor
- 3 lane section with 2 (1 northbound and southbound) moving traffic lanes and a center turn lane
- East side: **North Campus Esplanade Prototype** 10' green zone from curb to trail to accommodate shade trees and University lighting standards, a 12' multi-use trail, with the remaining areas for tree plantings to create the formal tree allée
- West side: **Campus Prototype:** Campus prototype with a 5' to 8' sidewalk and the remaining green zone from sidewalk to curb to accommodate tree plantings, University lighting standards, and Intermittent Bio - Detention Areas
- A hardscape plaza may be considered, in conjunction with the design of occupied space at the ground level of the future mixed-use parking structure envisioned by the plan
- Enhanced pedestrian crosswalks along Denison Avenue at Claflin Road, Jardine Drive and Kimball Avenue
- University gateways located at Denison Avenue and Jardine Drive and at Denison Avenue and Kimball Avenue
- Complementary gateways (optional) for the College of Veterinary Medicine and the Peters Recreation Complex
- Signage for University Gardens, Veterinary Medicine facilities, Jardine Student Life, Mike Goss Tennis Center, Peters Recreation Complex, and Bramlage Coliseum



Denison Ave Section looking North



Parallel-to-Road Concept Elevation: Two Column Option



Parallel-to-Road Concept Elevation: Two Column Option

Jardine Drive, Claflin Road, KSU Research Park

Concept: Streetscape as cohesive unifying thread

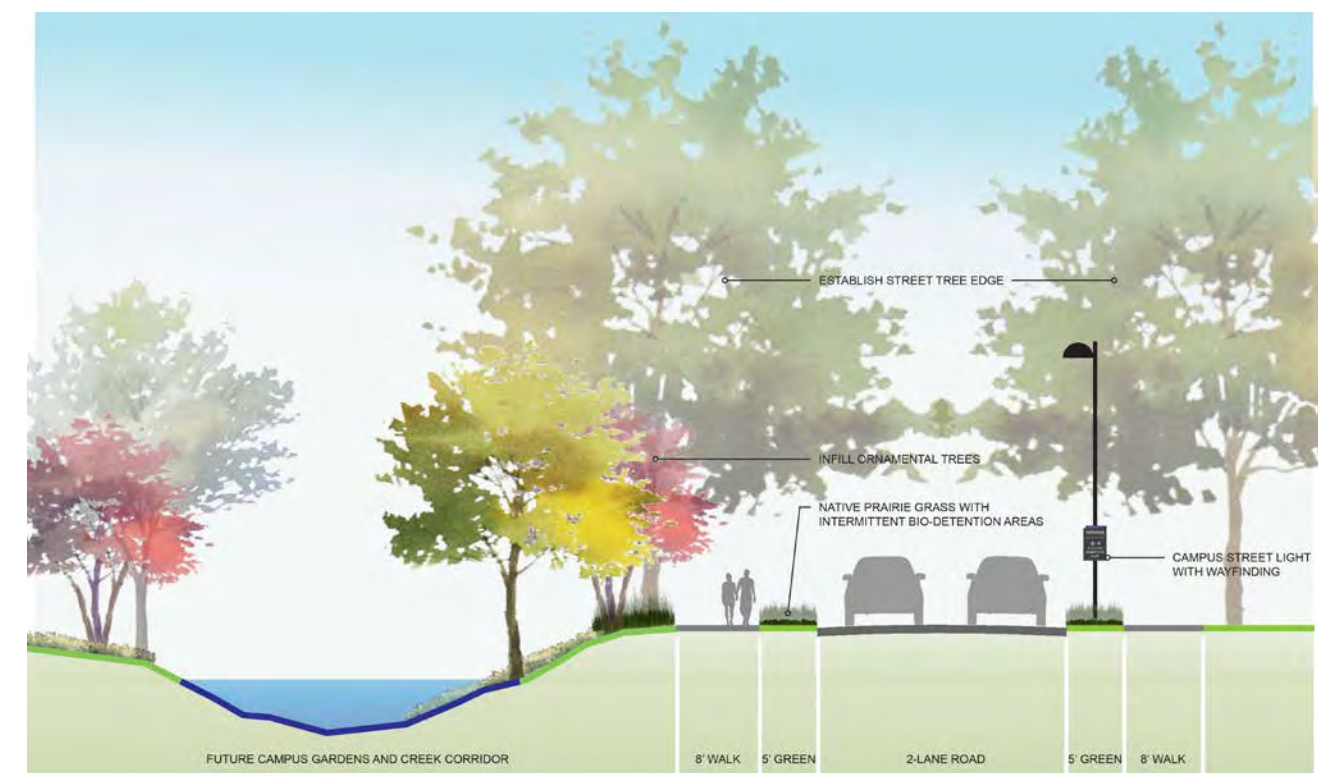
Campus Prototype: Create an aesthetic that includes a cohesive thread and unifies the campus.

Kit of Parts:

- When feasible on both sides, provide enhanced mobility and landscape
- 8' sidewalk width
- 5' landscape zone between curb and walk with native prairie grasses, turf and intermittent bio - detention areas
- University lighting standards
- Ornamental & shade tree clusters where appropriate
- Optional: low limestone walls and black metal picket fencing with limestone columns (where appropriate)
- Enhanced pedestrian crosswalks along Denison Avenue at Claflin Road, Jardine Drive and Kimball Avenue
- University gateways at Jardine Drive and Denison Avenue
- Complementary gateway moments (optional) for College of Veterinary Medicine and College of Agriculture
- Signage moments for all buildings within these Corridors
- Enhanced pedestrian crosswalks along Denison Avenue at Claflin Road, Jardine Drive and Kimball Avenue
- University gateways at Denison Avenue and Jardine Drive and at Denison Avenue and Kimball Avenue
- Complementary gateways (optional) for the College of Veterinary Medicine and Peters Recreation Complex
- Signage for University Gardens, Veterinary Medicine facilities, Jardine Student Life, Mike Goss Tennis Center, Peters Recreation Complex, and Bramlage Coliseum



Claflin Road Section Looking East



Jardine Drive Section Looking East

North Manhattan Avenue

Concept: Streetscape as cohesive unifying thread

Campus East Perimeter: Continue unifying aesthetic to further define the east campus perimeter and preserve natural wooded areas.

Kit of Parts:

- West side of North Manhattan Avenue: preserve established woodlands that provide a green buffer from Jardine Drive to the KSU Research Park
- Landscape zone between curb and walk with native prairie grasses, turf and intermittent bio - detention areas - width will vary
- 8' sidewalk width
- Relocate all overhead utilities underground
- University lighting standards
- Ornamental & Shade Tree Clusters where appropriate
- Low limestone walls
- Enhanced pedestrian crosswalks along North Manhattan Avenue at Claflin Drive and Jardine Drive
- University gateways at North Manhattan Avenue and Jardine Drive
- Complementary gateways (optional) for KSU Research Park
- Signage for KSU Research Park

College Avenue

Concept: Streetscape as cohesive unifying thread

Campus West Perimeter: Continue unifying aesthetic to further define the west campus perimeter and present a softer foreground to the monumental scale of Vanier Athletic Complex venues.

Kit of Parts:

- East side of College Avenue
- 8' sidewalk width
- Relocate all overhead utilities underground
- Landscape zone between curb and walk with native prairie grasses, turf and intermittent bio - detention areas - width will vary
- University lighting standards
- Shade trees and low shrubs and plantings to mitigate visual scale of the west lot from the public realm
- Optional: Low limestone walls and black metal picket fencing with limestone columns (where appropriate)
- Enhanced pedestrian crosswalks along College Avenue at Kimball Avenue. A secondary crossing may be considered, near the location of the Hospital drive for game-day events
- University gateways at College Avenue and Kimball Avenue
- Complementary gateways (optional) at Vanier Athletic Complex
- Signage for Bill Snyder Family Stadium, West Stadium Center; Vanier Football Complex, Bramlage Coliseum and Basketball Training Facility, Tointon Family Stadium; John Allen Strength Center, Brandeberry Indoor Facility and R.V. Christian Track Complex



North Manhattan Avenue Section Looking North



College Avenue



CAMPUS INFRASTRUCTURE: STORMWATER AND PUBLIC UTILITIES

STORMWATER

Stormwater Detention and Treatment Options

Purpose

Kansas State University has expressed concern related to treatment and storage of future stormwater runoff created as a result of the implementation of its North Campus Corridor Master Plan.

As the North Campus Corridor develops over time there will be an increasing need for a comprehensive analysis of existing and future stormwater run-off. This exploration would ideally lead to a stormwater master plan for the entire campus to address the full scope of campus enhancements proposed in both the 2012 Campus Master Plan, the 2025 Kansas State University Master Plan Stormwater System Update (2013), as well as the North Campus Corridor Master Plan. It is recommended that KSU adopts a stormwater policy to limit developed peak flows to existing conditions for future site development in a manner similar to the City of Manhattan.

Underground detention (under parking) can provide significant reductions in peak stormwater flows when enough space is not available for conventional detention. Additionally, each development site should consider low impact development (LID) techniques to achieve pre-developed peak flows. There are many LID techniques, including infiltration and retention swales, rain gardens, green roofs, permeable pavers, and cisterns, that can be coordinated with the recommendations from the Landscaping portion of the Master Plan.

In continuing partnership with the City of Manhattan and Riley County, this future plan would identify and integrate the most appropriate and viable methods of stormwater detention and treatment. These methods should take into account unique qualities of the North Campus Corridor such as it's high visibility, its gateway function, its connection to partners and neighbors, and the critical value of adjacent

research lands. Selected best management practices should preserve existing research plots, provide opportunities for new interdisciplinary research across the sciences and agriculture, address area specific functional goals, improve the public realm and recreation, and provide a landscape aesthetic that supports the overall K-State campus image and identity.

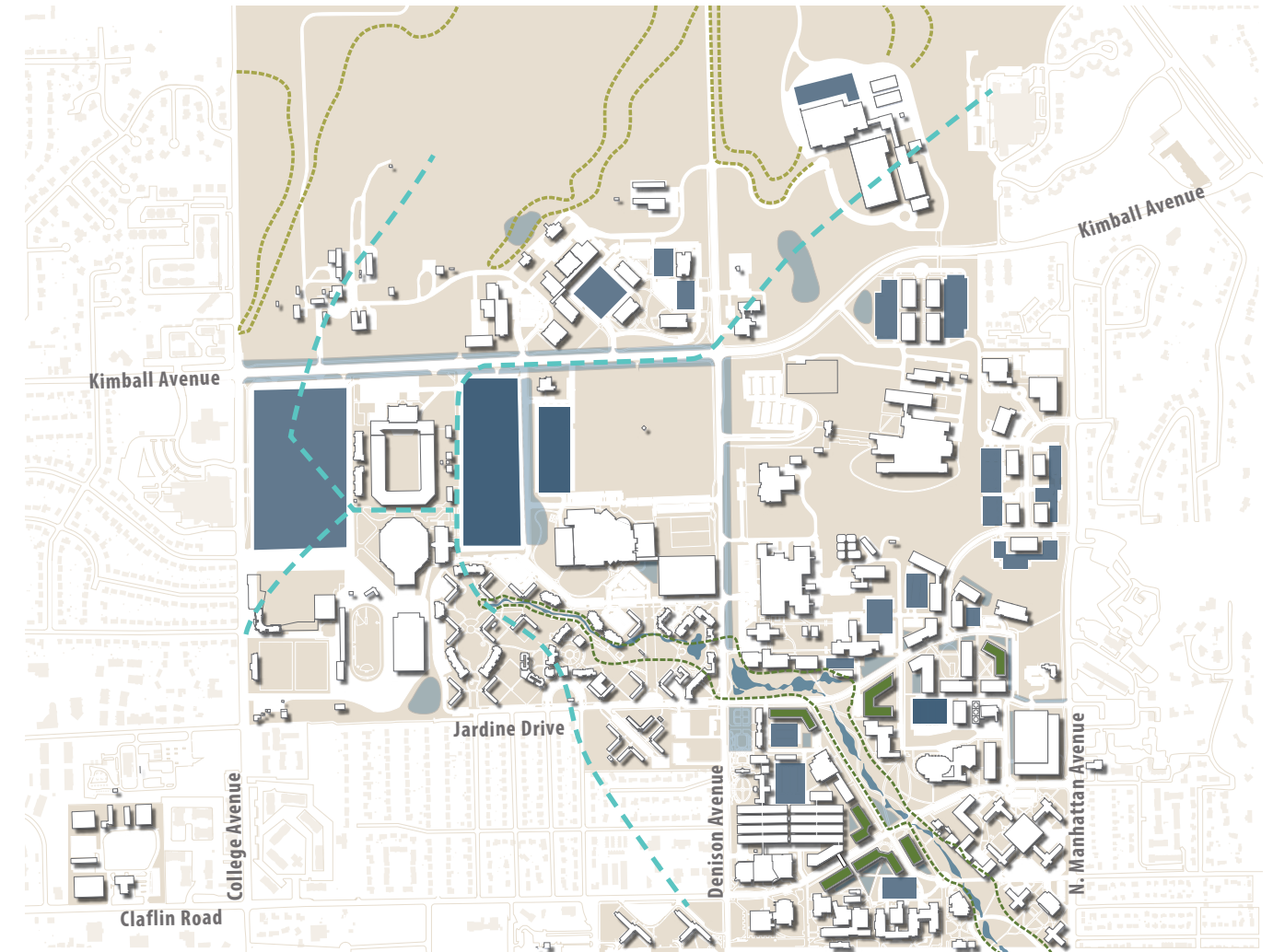
Recommended Best Practices

The North Campus Corridor Master Plan does not address stormwater in the same detail as signage and transportation. In the future as capital planning unfolds and before programming, design and construction are complete on the proposed projects it is the intent of the University is to incorporate stormwater management best practices. While the information in this section is not sufficient to guide future development, it does provide a framework for the options that are available to KSU in addressing stormwater regulations, requirements and concerns. It also provides information about ways the campus can exhibit environmental stewardship and innovative design while addressing an increasingly regional, national and global concern.

The following recommendations were created to assist the University in the future design and construction of stormwater detention basins and structures. Future structures and detention basins shall detain the increased runoff from additional impervious areas and also treat all runoff so that downstream receiving waters are not contaminated.

Structures and Detention Basins

With each project associated with the North Campus Corridor Master Plan, there will be different options for the treatment and storage of stormwater runoff. The options listed below are options that will work for the campus area and can also be readily maintained.



Stormwater Management Opportunities

- Potential Landscape Stormwater BMPs
- Potential Parking Lot Stormwater BMPs
- Potential Green Roofs
- Ag. Water Drainage
- Campus Creek Preserve
- City of Manhattan Principal Watershed Boundaries

Detention Basin

The detention basin is designed to contain additional runoff from development, but it does not treat the runoff. If runoff is being treated elsewhere, this is a viable option. This option requires minimum maintenance and does not have a maximum allowable treatment area.

Underground Detention Basin

Like the detention basin, the underground detention basin will contain the additional runoff from development, but it will also treat runoff. The underground detention basin includes an isolator row of chambers that is used to remove debris and sediments from runoff. The isolator row includes an access manhole that allows for the minimum maintenance of cleaning the isolator row of debris and sediment. Maintenance is required every few years depending on sediment runoff. Permeable pavement can be used with underground detention easily, but will require additional maintenance of the pavement.

Sand Filters

Sand filters treat stormwater runoff by collecting the runoff in a self-contained bed of sand, above ground or below, and removing sediments before the runoff is released into an outfall pipe. The sand filters are built on sites based on the drainage area to the filter, and can treat up to a five-acre area. Maintenance is required to remove sediment and debris. If the sand filter is below grade in chambers, this will require a confined space access.

Native Vegetation and Native Vegetation Swales

Native vegetation and native vegetation swales can be planted on sites to treat runoff. This intervention gives a natural look while also providing a high rate of treatment. Native vegetation plantings consist of prairie grasses and other species. The drainage area that can be treated by a vegetated swale is dependent on the size of the swale and the land cover. Generally this method can treat up to five acres.

Extended Dry & Wet Detention Basin

The extended dry and wet (has water in it at all times) detention basins are designed to control the

outflow of the basin for up to 40 hours. This allows the sediments to settle before being released. The extended dry and wet detention basins are designed and constructed like a typical detention basin, but requires a different outfall that will control and release less flow. The extended dry and wet detention basins do require more maintenance than a typical detention basin, but mainly for the outfall. The outfall must be cleared of all the sediment that is removed from the runoff.

Catch Basin Inserts

Catch basin inserts are fabric liners that can be inserted in inlets. Catch basin inserts are typically used in treatment trains to help the treatment ratings of downstream treatment areas. They can be retrofitted for existing structures, but are typically not a standalone treatment. With pre-developed areas around campus, they could be installed to help mitigate the sediment and debris entering the existing stormwater system. Catch basin inserts do need to be inspected frequently to help insure they will not clog.

Alternative Parking Design

The main objective when creating permeable parking lots is to reduce the amount of total impervious cover. The problem with a majority of parking lots today is that they are constructed with impervious pavement that directs all the stormwater into the storm sewer system. When it rains the water is channeled to the nearest storm drain and may overwhelm the storm sewer system. Permeable pavements or pavers are also a viable option.

Permeable Pavement

Permeable pavement is an alternative to asphalt and concrete that allows stormwater to drain through the porous surface to a reservoir underneath. The reservoir temporarily stores the surface runoff before infiltrating the subsoil where the stormwater is naturally filtered and pollutants removed.

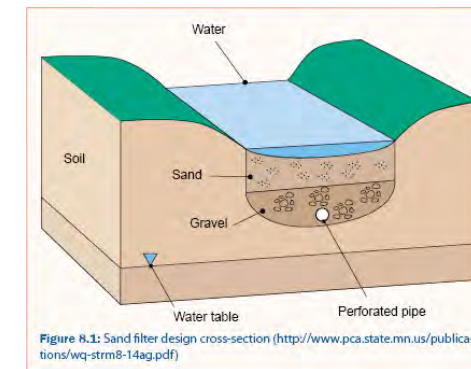
Permeable pavement performs well in pedestrian walkways, sidewalks, driveways, parking lots, and low-volume roadways. The environmental benefits



Example Detention Basin



Example Underground Detention Basin



Example Sand Filter



Example Detention Basin with Native Prairie Grasses



Example Wet Detention Basin



Example Permeable Pavement



Example Permeable Pavers



Example Cisterns

of porous asphalt are an important reason to incorporate it into municipal green infrastructure and low impact development programs. Permeable pavement, which has a similar look as asphalt or concrete, is manufactured without fine materials so as to allow the water to trickle through the pavement and into the reservoir.

Permeable Pavers

Permeable pavers are interlocking concrete block pavers that create voids to allow stormwater infiltration. Plastic turf reinforcing grids are added for structural support for the topsoil and help reduce compaction to maintain permeability. Between the pavers, in the void space, it is recommended to plant grass to allow roots to grow, also improving permeability.

The pavers are manufactured like normal pavers with the elimination of finer particles. In addition to providing stormwater volume and quality management, the lighter color of concrete is cooler than conventional asphalt and helps to reduce urban temperatures and improve air quality. Unlike the smoothed surface of conventional concrete, the surface texture of pervious concrete is slightly rougher, providing more traction to vehicles and pedestrians. These pavers perform well in pedestrian walkways and low-volume roadways.

Rain Barrels and Cisterns

This method of storm water management directs stormwater from an impervious surface - such as a roof or parking lot - to rain barrels or cisterns where it is captured, stored, and reused. Rain barrels are generally used for smaller systems such as gutters on smaller buildings while cisterns are larger storage units. These units typically do not treat the water at all and collect water using gravitational flow.

The primary reason to use these interventions is to reduce runoff and collect water for reuse. In small storm events these stormwater management options may also delay and/or reduce peak flow runoff.

Storm System Improvements

The North Campus Corridor Master Plan reviewed the existing land use situation and compared it with future proposed North Campus Corridor improvements. As each improvement is made and permeable areas are transformed into impermeable areas, storm water improvements will need to be made. The Master Plan reviewed four different rainfall occurrences with design storm return periods of 2, 10, 50 and 100 years. Respectively, they have a probability of occurring each year of 50, 10, 2, and 1%. In further analyzing the 10 year design storm, which has a 10% probability of occurring each year, the current proposed improvements in the North Campus Corridor will have an increase in runoff of about 150 cubic feet per second (cfs) during that 10 year storm. At a minimum, it is recommended that the storm water system improvements will be put in place to handle this increase in storm water runoff to the surrounding area.

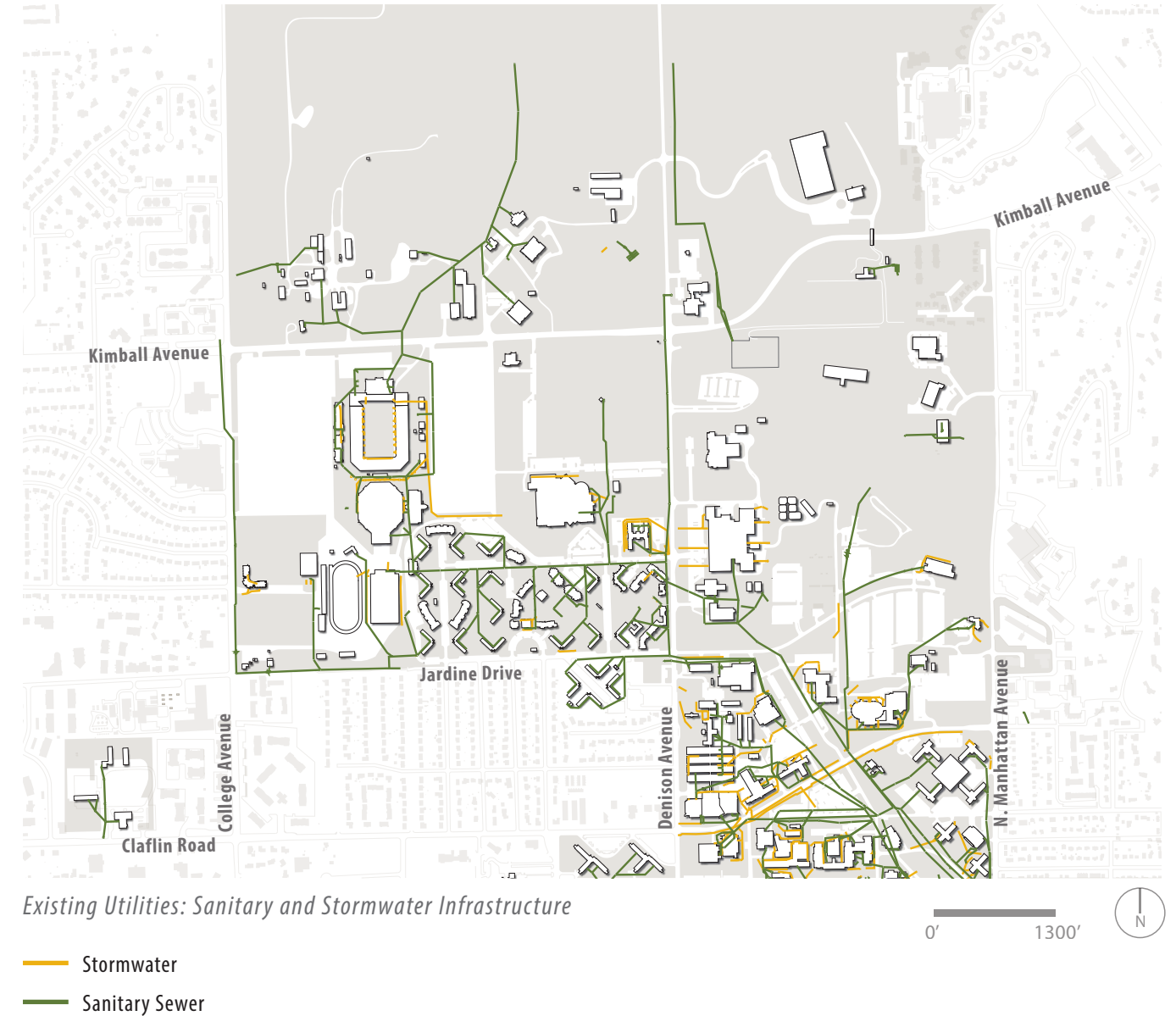
PUBLIC UTILITY

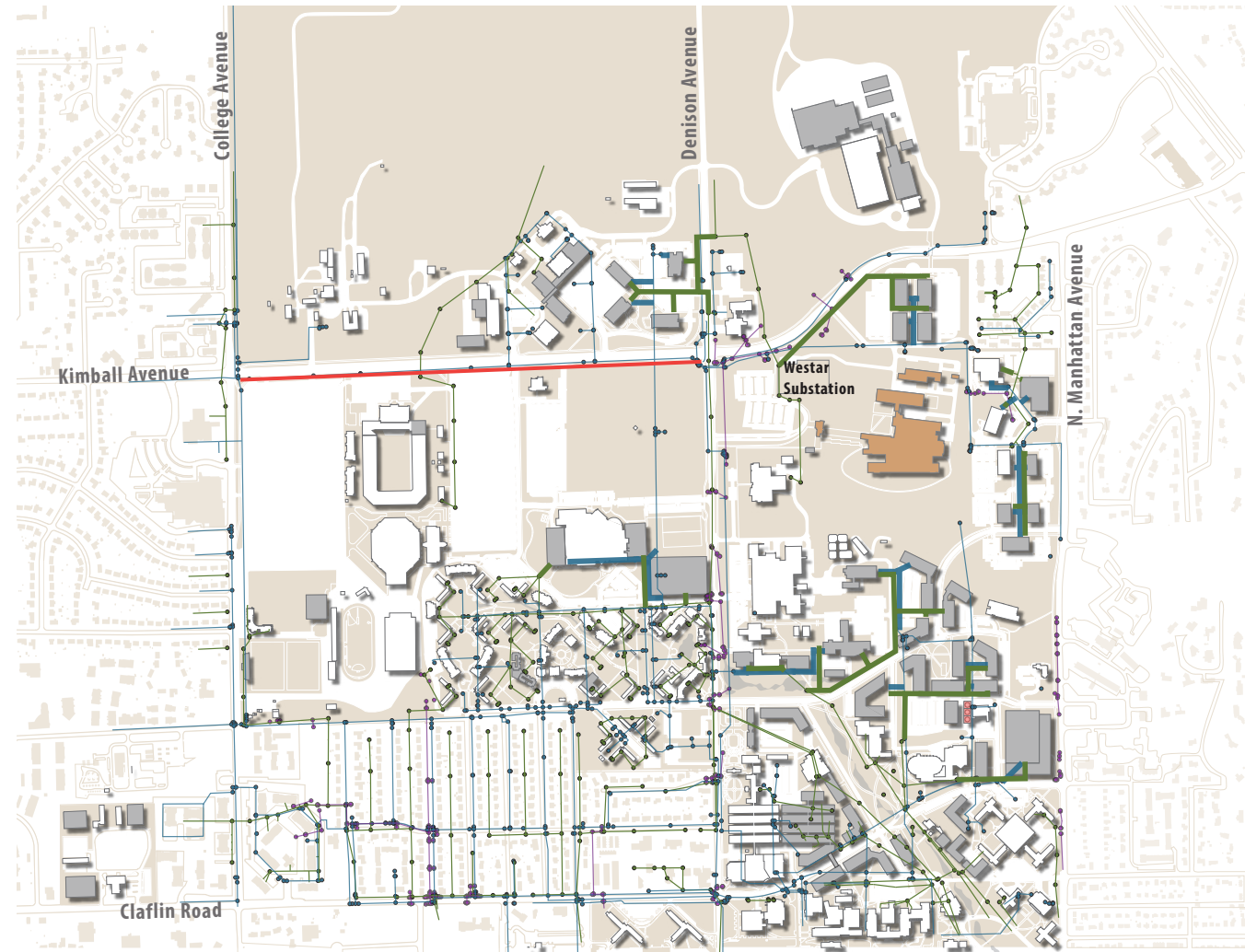
Public utility service to future Kansas State University buildings is a key part of the North Campus Corridor Master Plan. As a part of the master planning effort, extensive modeling of the City’s water and sanitary sewer systems has been analyzed for current and future scenarios. The City’s water mains and sanitary sewer mains are adequate for the proposed University improvements and expansions. Some of the individual collection and distribution lines will need to be relocated as certain proposed construction projects are finalized. However all lines appear to be able to be relocated during the construction of those specific projects.

It is not warranted as a part of the North Campus improvements, but the City is going to need another water transmission line going across the City. This line could go along Kimball Avenue, but it is more than likely going to be located along the Marlatt Avenue alignment.

Utility coordination meetings were conducted with the local utility companies with services located with the north campus corridor. All utility companies will be able to provide services to the proposed University improvements planned as a part of the Master Plan.

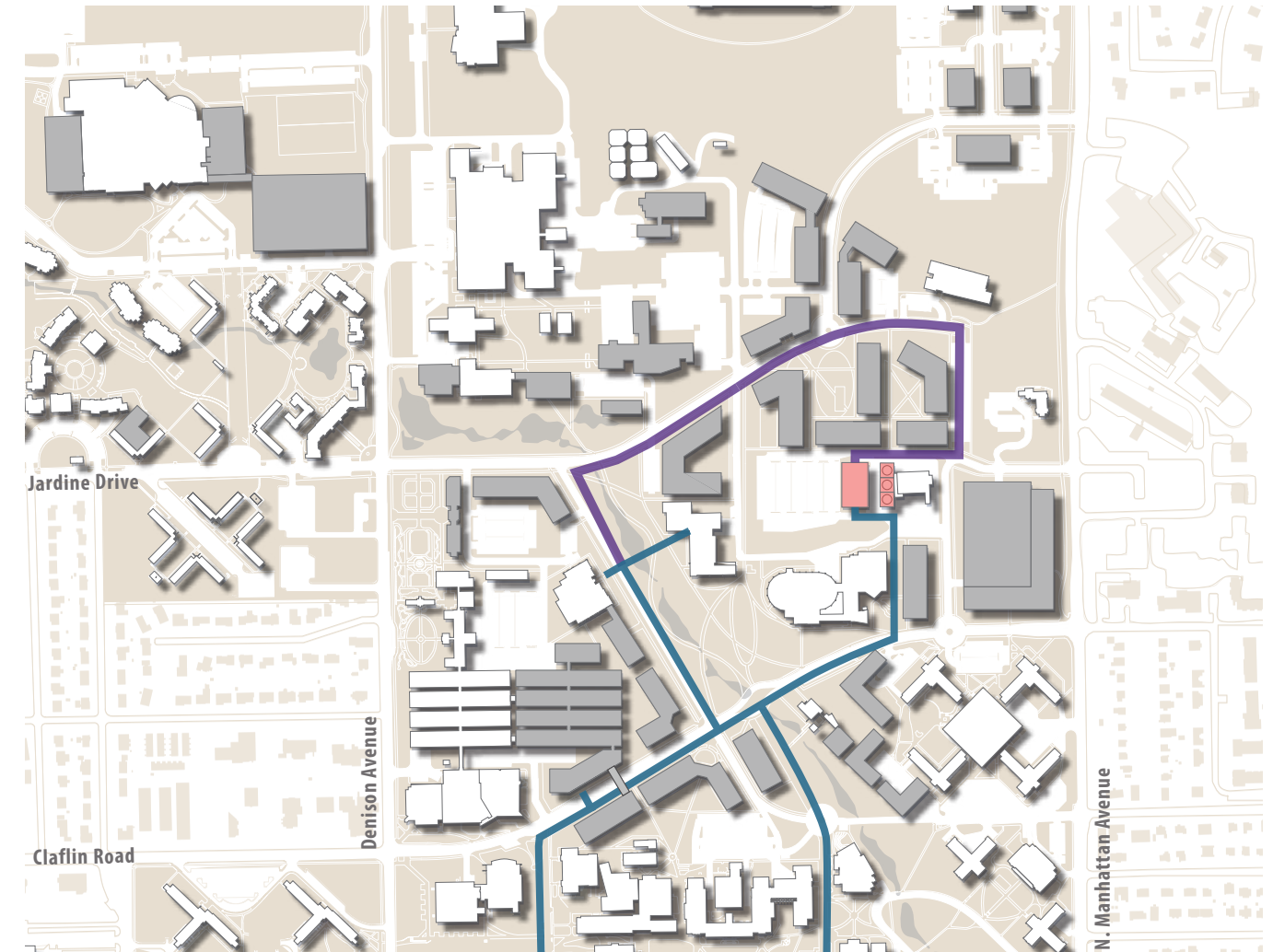
In particular, there is a major Westar electric line along the south side of Kimball Avenue. This existing overhead line is adequate for the proposed University improvements. The existing line should be relocated underground as a part of the proposed Kimball Avenue improvements.





Utilities

- Proposed Underground Electric
- Proposed Sanitary Sewer
- Proposed Water
- Storm Sewer
- Water
- Sanitary Sewer
- Chilled Water Plant Expansion
- Proposed campus building
- NBAF



Chilled Water

- Existing and Proposed Chilled Waterlines
- Future Chilled Waterlines
- Chilled Water Plant Expansion
- Proposed campus building

Chilled Water

The University is currently in the middle of a chilled water expansion project. As the University continues to redevelop between Clafin Road and the Veterinary Medicine Complex, another chilled water expansion project will need to take place to connect the other proposed buildings within that area of the North Campus.



CAMPUS PARKING AND TRANSIT STUDY

Introduction

Parking and transit will become important and interconnected issues as Kansas State University implements its master plan. The amount of parking available today in the core campus is limited during peak times. According to the master plan, many new facilities are to be constructed on the site of existing surface parking lots. Some of these projects are currently underway or are planned to begin in the upcoming years. These facilities reduce available parking and increase demand for parking in and near the core campus.

To address campus growth and loss of existing parking lots, the University must have a strategy to address future parking needs of the campus. Minimal space is available for parking in the core campus, so new parking will be farther from the core. As a result a robust transit system will be needed to connect new parking on the periphery to the center of campus.

Study Purpose

The purpose of this study is to evaluate existing parking and transit at Kansas State University and develop recommendations that can be implemented over the course of the next several years. These recommendations will address campus growth and the specific projects that are either underway or are being planned. The study also includes comparison to peer institutions. This study was completed in conjunction with development of the North Campus Corridor Master Plan.

Existing Conditions

Parking Supply

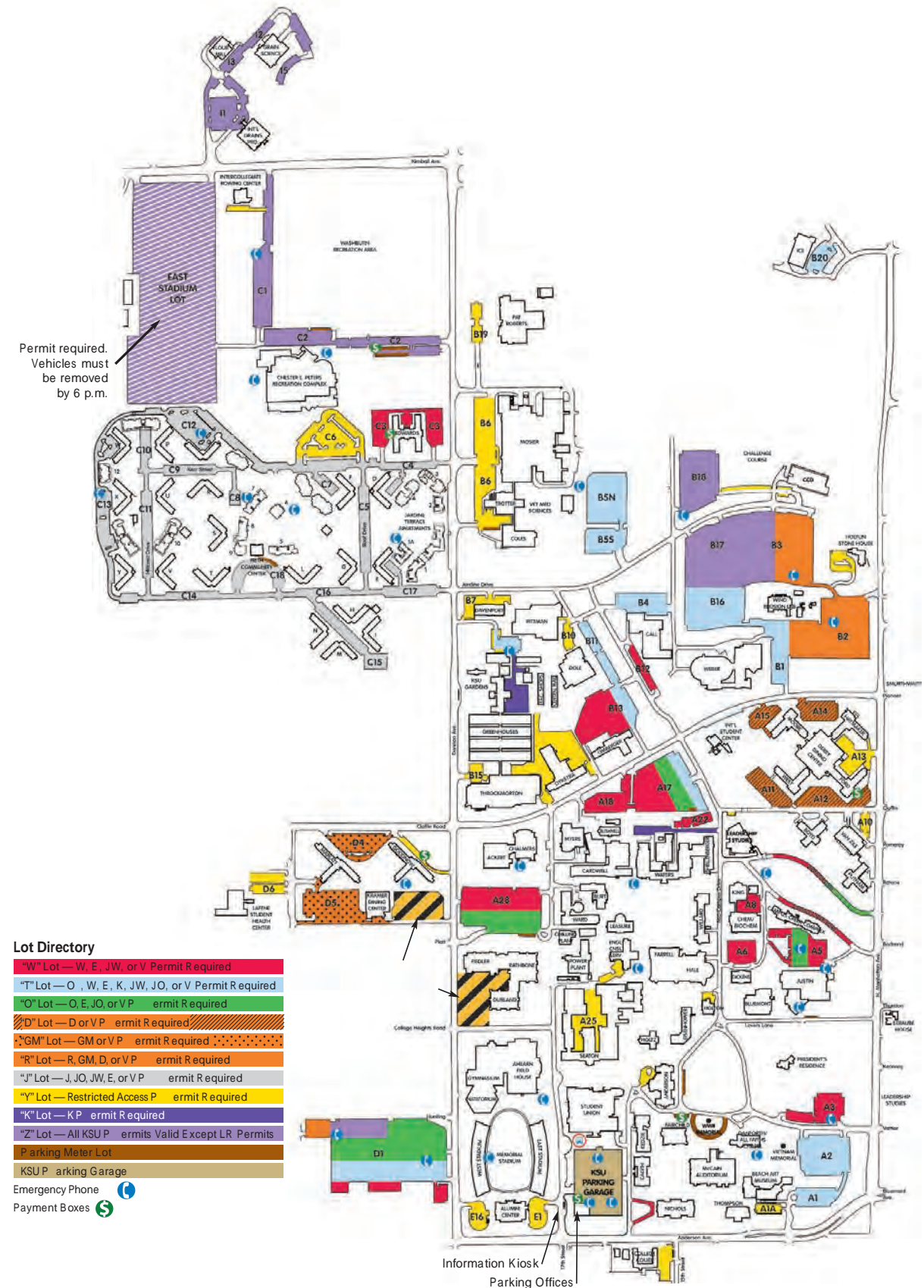
The campus parking supply and permit sales are administered by KSU Parking Services. Inventory data provided by Parking Services identified the location and type of permit required for roughly 11,250 campus parking spaces. There are an additional 4,400 parking spaces on the east and west sides of Bill Snyder Family Stadium which are not included in this inventory. The campus parking inventory is shown in Table 1 by type of permit designated for the spaces.

Several projects in progress affected the total number of spaces in the inventory at the time of this study. Lot D2 is closed for the construction of Wefald Hall. The off-street portion of A26 is closed for the expansion to the Engineering complex. A portion of lot A3 is closed for the construction of the new business building. Parking for university facilities that are not adjacent to the campus, such as the KSU Foundation building on Anderson Avenue and the forestry site on Claflin Road are not included in this inventory.

Table 1: Parking Space Inventory

Parking Lot Type	Designation	Number of Spaces*
O	Off Campus Students	619
W	Faculty/ Staff	1,370
K	Faculty/ Staff	84
T	O, W, K Permits Valid	1,736
D	Derby Complex Residents	345
GM	Kramer Complex Residents	318
R	Dormitory Residents	1,127
J	Jardine Apartment Residents	1,326
Y	Restricted Access	1,127
Z	All Permits Valid	1,737
Parking Garage	Faculty/ Staff Students and Metered	1,367
Other	Miscellaneous	97
Total		11,253

*Does not include motorcycle parking spaces



Campus Parking Map 2014-2015

The inventory includes nearly 1,400 spaces in the parking garage located in the northeast corner of Anderson Avenue and 17th Street, on the south side of the Student Union. The garage includes 500 student spaces, 400 preferred spaces, 130 reserved spaces, and 270 metered spaces. Drivers with permits allowing garage access are issued an RFID tag that operates the entry and exit gates. All other drivers take a ticket upon entry to the garage. Ticketholders can pay at the garage exit or at pay stations in the garage stairwell. Construction of the garage was completed during the 2009 - 2010 school year. At the current rate of payment for the garage, the debt will not be retired until around 2040.

Parking Permits

The types of parking permits correspond to the different categories of parking needs for the campus. The type of permit fees, number of permits sold, and revenue is shown in Table 2.

The majority of parking on campus is for faculty, staff, and off-campus students who commute to campus primarily during business hours on weekdays. There are different types of permits available for commuters. The cost of a staff parking permit varies by salary level. A small number of permits for reserved parking can also be purchased in many of the surface parking lots and in the parking garage.

Many on-campus residents have a vehicle parked on campus throughout each day of the week, including weekends. Residence Hall students can purchase a D, R, or GM permit. Jardine Apartment residents can purchase either a J permit, or a JO permit for an additional \$10. The JO permit allows them to park in both J and O lots.

The on-campus population in dormitories and apartments is roughly 5,200, and there were 3,877 on-campus resident parking permits sold during the 2014 - 2015 school year. This corresponds to approximately 75 percent of on-campus residents

purchasing parking permits, which is a higher percentage than are purchased by the off-campus student population. This is due in part to many off-campus students living close enough to campus that they can bike or walk. There are also a number of off-campus students who park on the streets in the neighborhoods surrounding the campus.

The total number of permits sold in 2014 – 2015 exceeds the inventory for an oversell ratio of 1.2 permits per parking space. Off-campus commuter parking is typically oversold on campuses because the demand for commuter parking varies by day of week and time of day. This is especially true of students who do not attend classes all day every day. Parking for on-campus residents cannot be oversold because essentially all residents with a vehicle need parking available overnight and during much of the weekday.

Parking fees will increase for each type of permit by approximately 5 percent for the 2015 – 2016 school year. With the fee increase, the average student permit (without parking garage access) will cost \$180 per year and the average employee permit will cost \$185 per year. If the same number of permits is sold in 2015 – 2016 with the new fee structure, the total revenue will be approximately \$2,860,000.

Parking Data Collection

To determine how the existing parking supply is utilized, parking occupancy data was collected during typical weekdays when regular classes were in session. The number of parked vehicles was manually inventoried on Tuesday, December 9, 2014, and Wednesday, December 10, 2014. During these days, temperatures were close to the averages, skies were clear, and there was no precipitation. Inventories were conducted at each parking area every two hours during one of the days between 7:00 a.m. and 5:00 p.m. Parking occupancy data for the garage was derived from the count of entering and exiting vehicles, which was provided by Parking Services staff. The peak occupancy of each lot was generally

Table 2: 2014-2015 Annual Parking Permit Fees and Revenue

Parking Permit Type	Designation	Permit Cost	Number of Permits Sold*	Permit Revenue
O	Off-Campus Student	\$170	2,109	\$358,530
O (with garage access)	Off-Campus Student	\$180	4,007	\$721,260
R, D, GM	Residence Hall	\$170	2,991	\$508,470
J	Jardine Apartment Residents	\$170	133	\$22,6101
JO	Jardine Resident Commuter	\$180	753	\$135,540
W, K, Y	Faculty Staff (FT1)	\$150	437	\$65,550
	Faculty Staff (FT2)	\$175	1,315	\$203,125
	Faculty Staff (FT3)	\$190	1,502	\$285,380
	12-Hour Reserved	\$900	89	\$80,100
	24-Hour Reserved	\$1,300	14	\$18,200
Garage Preferred	Faculty Staff	\$410	294	\$120,540
Garage Reserved	Faculty Staff	\$610	119	\$72,590
Total			13,247	2,591,895

*Through April 10, 2015

Table 3: Peak Parking Occupancy

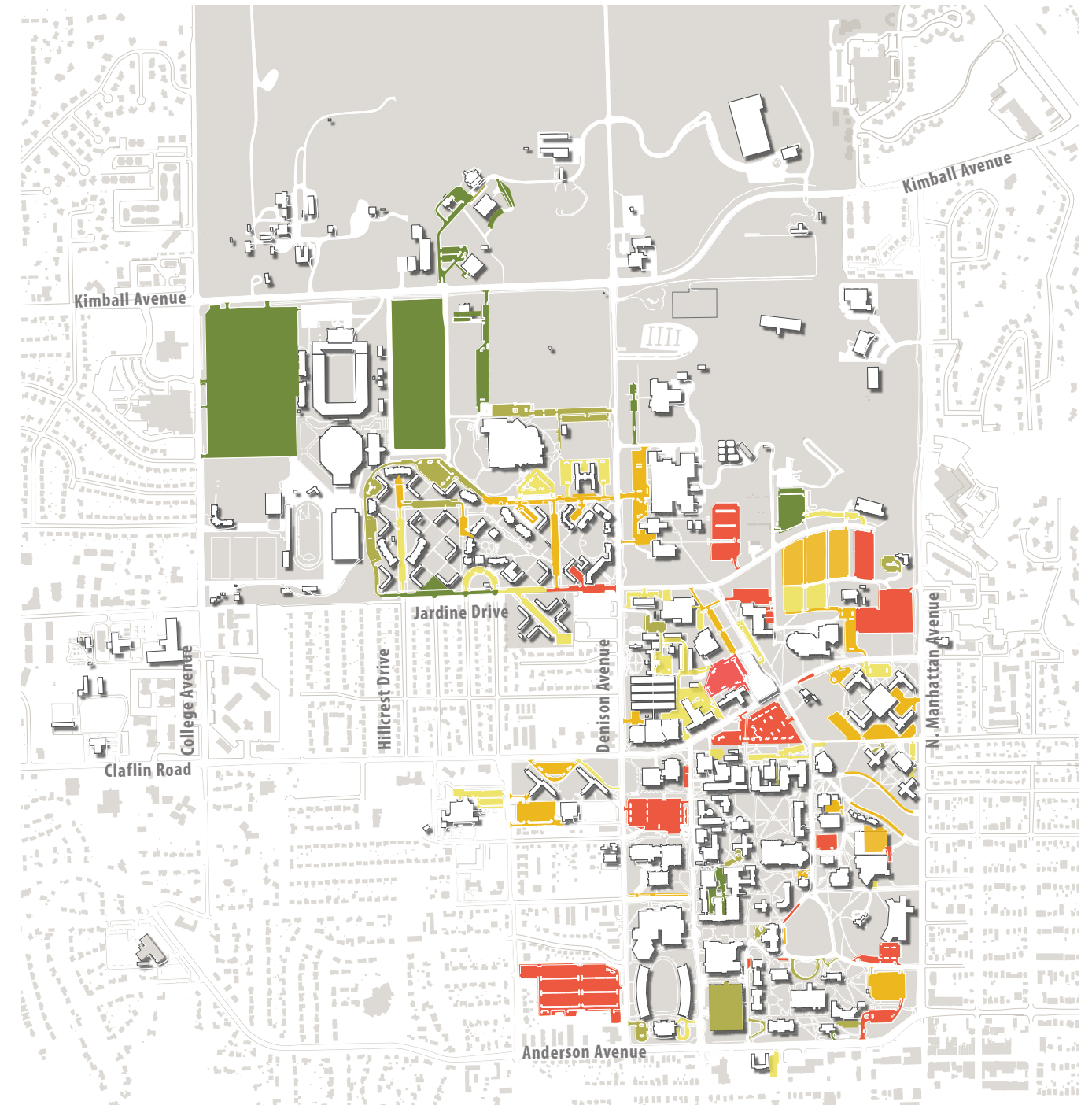
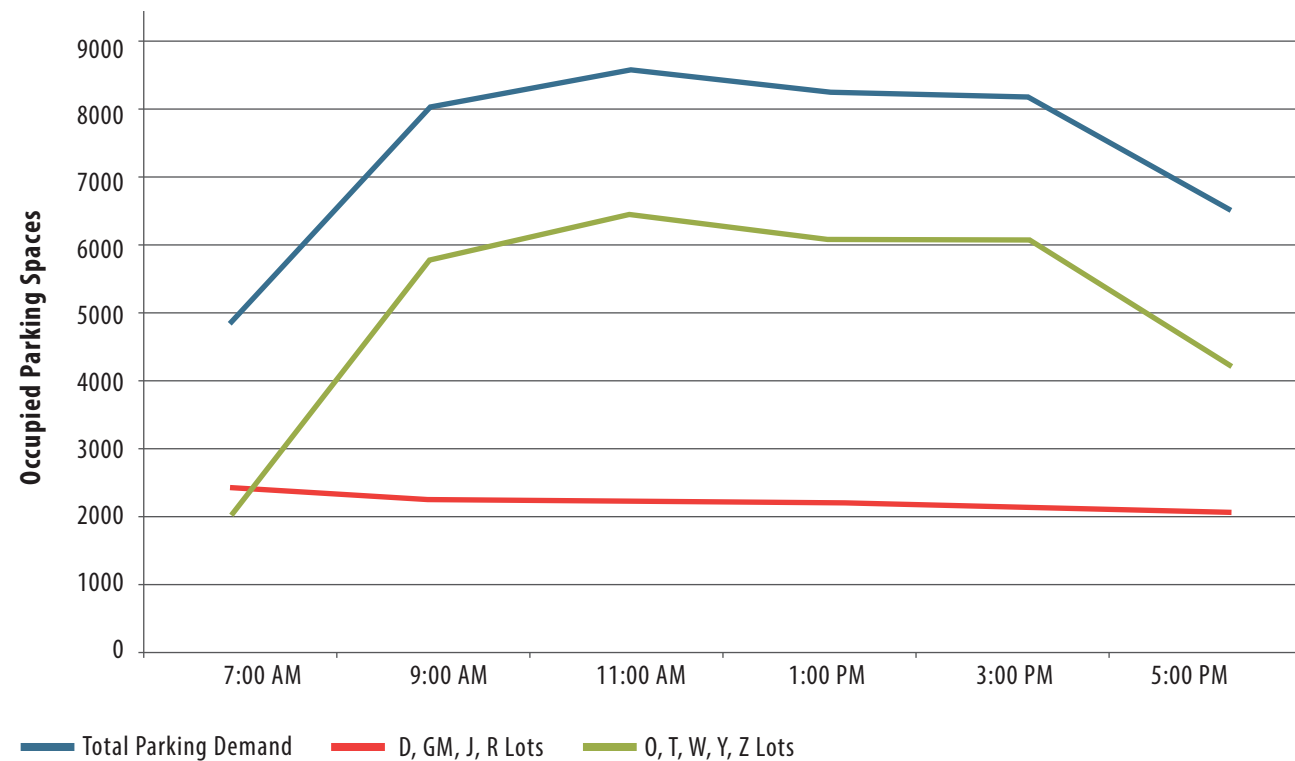
Parking Lot Type	Designation	Number of Spaces	Peak Occupancy	Percent Occupied
O	Off-Campus Students	619	609	98%
W	Faculty/ Staff	1,370	1,263	92%
K	Faculty/ Staff	84	64	76%
T	O, W, K Permits Valid	1,736	1,612	93%
D	Derby Complex Residents	345	304	88%
GM	Kramer Complex Residents	318	291	92%
R	Residence Halls	1,127	1,132	100%
J	Jardine Apartment Residents	1,326	959	72%
Y	Restricted Access	1,127	875	78%
Z	All Permits Valid	1,737	1,080	62%
Parking Garage	Faculty/ Staff Students and Metered	1,367	864	63%
Other	Miscellaneous	97	78	80%
Total		11,253	9,131	81%

found to occur between 9:00 a.m. and 1:00 p.m. The results of the parking occupancy data collection is shown in Table 3.

The data collected indicates that most of the surface parking areas south of Claflin Road are essentially full at peak times on a typical weekday. The available parking remaining consists of reserved, metered, or handicapped spaces. Parking occupancy begins to decrease north of Claflin Road, but remains at 70 percent or more in most areas. The only sizable parking areas with low occupancy percentage are north of Jardine Drive. The exception to this is the parking garage at the Student Union. It has a low parking occupancy rate due to low usage of reserved, preferred, and metered parking at the time of the data collection.

The graph illustrates the demand for parking over the course of a typical weekday. The peak demand for parking on campus occurs at 11:00 a.m., then slowly declines throughout the afternoon. One trend to note is demonstrated when the parking demand for on-campus residents and commuters is separated. The demand for on-campus residents is essentially unchanged throughout the course of a typical weekday, while the commuter demand fluctuates. This indicates that on-campus residents generally do not use their vehicles over the course of a typical weekday. Many on-campus residents park in Z lot as well (lot D1 and B17) because R lots are at capacity during all time periods.

Parking Occupancy During a Typical Weekday



Existing Peak Parking Occupancy

- < 50% Peak Occupancy
- 50%-70% Peak Occupancy
- 71%-85% Peak Occupancy
- 86%-95% Peak Occupancy
- > 95% Peak Occupancy

Transit Routes

The Flint Hills Area Transportation Agency (ATA) currently operates two fixed routes on campus and four city-wide fixed routes. These routes are illustrated on the existing transit service figure. The fleet is composed of ADA-accessible, 20-passenger cutaway vehicles equipped with bicycle racks. Detailed information for the existing routes, is included in the appendix and is based on FY 2014 from July 1, 2013 to June 30, 2014 (with the exception of the Park and Ride route that is based on estimates from the Fall 2014 semester). In FY 2014, ATA provided 248,868 total trips.

Jardine Shuttle

The Jardine Shuttle serves approximately 600 students with residence hall contracts that reside in the Jardine Apartments due to housing shortages at the residence halls on campus. These 600 students require transportation to the Derby Dining Center for meals. The Derby Dining Center is more than one-half mile away from the Jardine Apartments and nearby parking is limited. The few parking spaces that may be available are largely reserved or metered spaces. To accommodate these students, ATA operates the Jardine Shuttle directly between the apartments and the Derby Dining Center throughout the day with a service frequency of 10 minutes. In FY 2014, the Jardine Shuttle provided 156,976 trips – an increase in ridership of nearly 50 percent from the previous year. It is the highest ridership route provided by ATA.

Campus Park and Ride

The Park and Ride, which first began operating in Fall 2014, shuttles commuters from the B17 parking lot north of Weber Hall to stops along Mid-Campus Drive before looping back at McCain Auditorium. Because the Park and Ride has only been in operation for one year, there is limited ridership information available. The latest data reports that 4,071 trips were provided during the Fall 2014 semester from late August through mid-December.

Citywide Routes

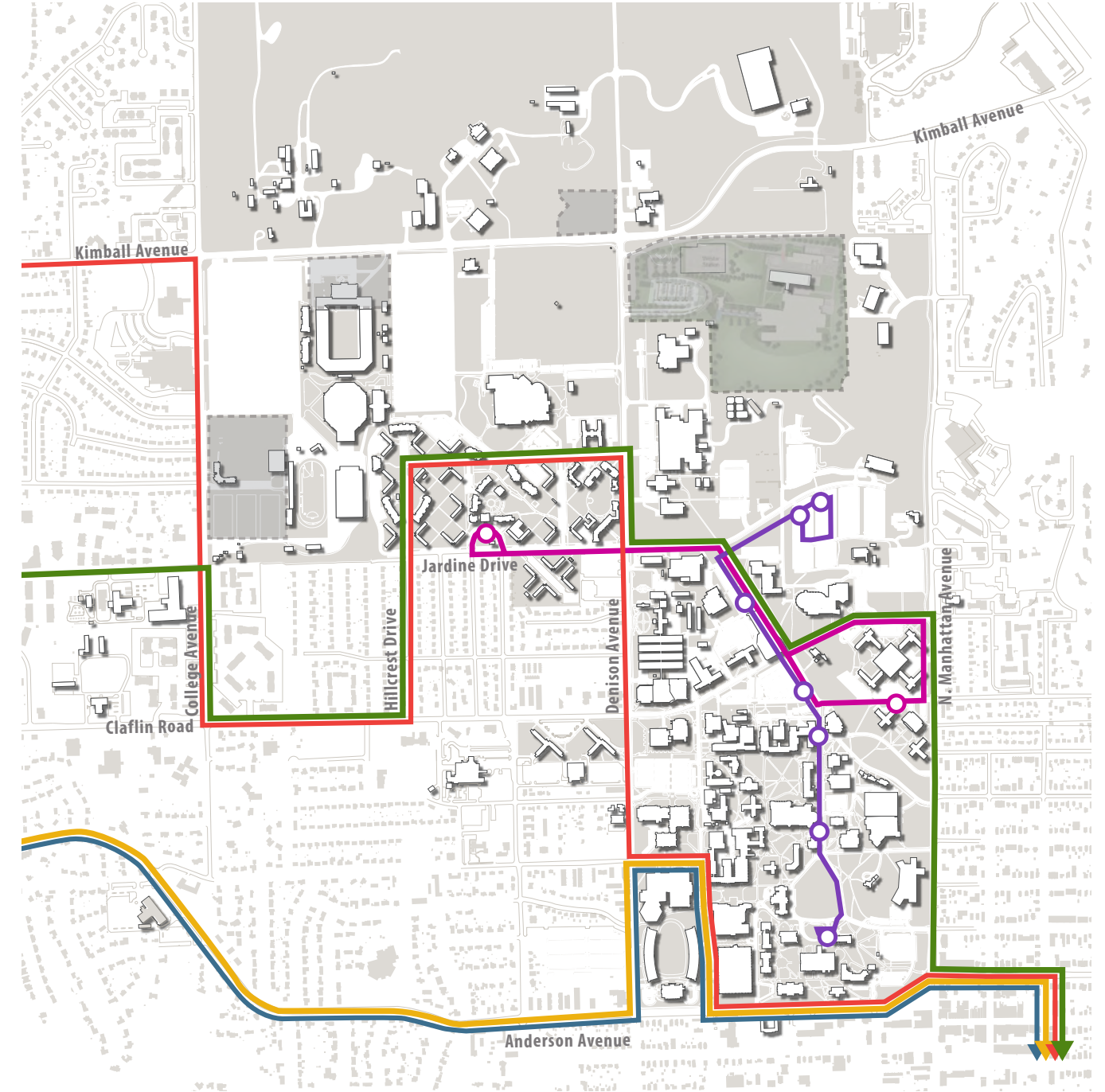
The four city-wide fixed routes travel through campus. The routes are named Orange (Fremont/Osage), Green (Dickens), Blue (Bluemont), and Red (Candlewood). In FY 2014, ATA provided 49,956 trips on city-wide routes – a decrease in ridership of approximately 8 percent from the previous year. The Red (Candlewood) route is the highest ridership route followed by the Blue (Bluemont) route. The Kansas State University Student Union is the highest ridership bus stop for all four city-wide routes. According to the 2014 ATA Annual Report, 75 percent of off-campus students and 35 percent of employees live within five minutes of the ATA city-wide routes.

University Crossing Route

In addition to the city-wide and campus routes, ATA operates an additional route for the privately-owned, 700-tenant University Crossing Apartments. The University Crossing shuttle is funded as a public deviated route through state and federal funding with the local match by the University Crossing Apartments. The apartment complex is located northwest of Kimball Avenue and College Avenue. The shuttle stops at the University Crossing Apartments and the Kansas State University Student Union, but will deviate up to 3/4-mile to pick up riders who have requested a ride with at least 24-hour notice. Service is free for apartment residents and \$2.00 for the general public. In FY 2014, ATA provided 25,914 trips on the University Crossing route – an increase in ridership of about 30 percent from the previous year. This route is largely a duplication of the Red (Candlewood) route.

SafeRide

In addition, ATA also offers three campus routes as part of the SafeRide shuttle service. The SafeRide program offers students and their guests a safe ride home on Thursday through Saturday nights. In FY 2014, the three SafeRide routes provided 16,022 trips.



Existing Transit Service

- Jardine Shuttle
- Jardine Shuttle Stops
- Campus Park and Ride
- Park and Ride Stops
- Fremont/ Osage Bus Route (Kansas State in session)
- Bluemont Bus Route (all year)
- Dickens Bus Route (University in session)
- Candlewood Bus Route (all year)



Transit Revenue and Operating Costs

In FY 2014, ATA had a total revenue of \$1,831,410 (including demand response service). Federal grants provided \$1,142,829 while service contracts generated \$550,975. Farebox recovery generated an additional \$130,982. Excluding federal funding, the largest source of funds is the service contract with Kansas State University for \$289,750 – approximately 16 percent of the total revenue. The university contract covers the operating cost for the campus routes in addition to subsidizing a portion of the city-wide routes. Because the Park and Ride shuttle was not in operation during FY 2014, the referenced contract information does not include the Park and Ride route (estimate provided by ATA for the Park and Ride route for the Fall 2014 semester is approximately \$37,000).

Campus routes are currently funded by six different funding sources: four university departments, one private entity, and general ATA funding through state and federal funds. There is no student fee dedicated to transit service at this time and service on the campus routes is provided at no charge to students, faculty, and staff with valid university identification. Students, faculty, and staff are also eligible for free point-to-point service on the city-wide routes only from the Kansas State University Foundation, the Student Union, or Edwards Hall. Full fare for the general public on city-wide and campus routes is \$1.00 (with the exception of SafeRide routes for \$2.00 for the general public).

The total operating budget for FY 2014 was \$562,316. Of that budget, the Jardine shuttle has an annual operating cost of \$114,417, which converts to an hourly operating cost of \$23.38 per hour. Annual operating cost of the campus Park and Ride route is not included in the budget as it was not in operation during FY 2014. The operating cost for the Park and Ride route is estimated to be \$74,000, or an hourly operating cost of roughly \$38.50 per hour.

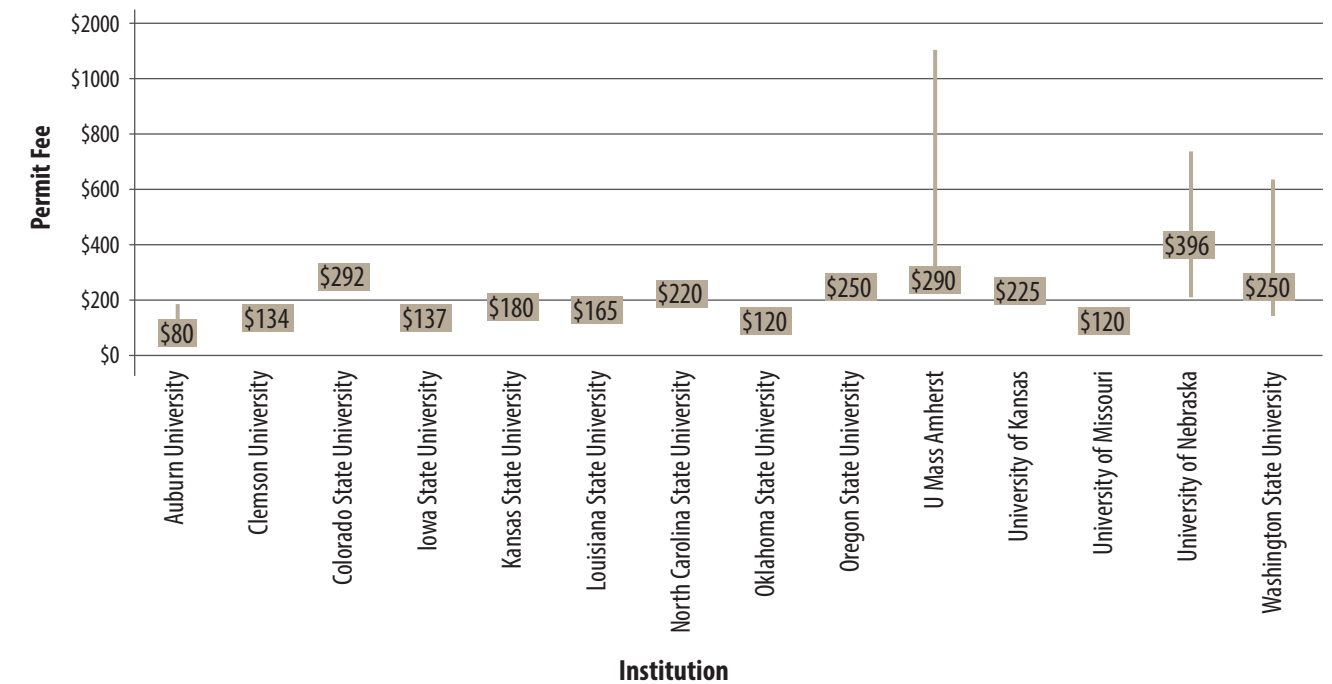
Peer Comparisons

Parking and transit information was collected from thirteen peer institutions. The peer institutions were identified by the University and include ten land grant institutions with similar enrollment and academic programs that represent a broad geographic distribution. Three other institutions were included that are within close proximity to Kansas State University for local comparison as well. The peer data was analyzed to compare practices and to provide context for recommendations that were developed for Kansas State University. Key findings from the peer institutions comparisons are provided below:

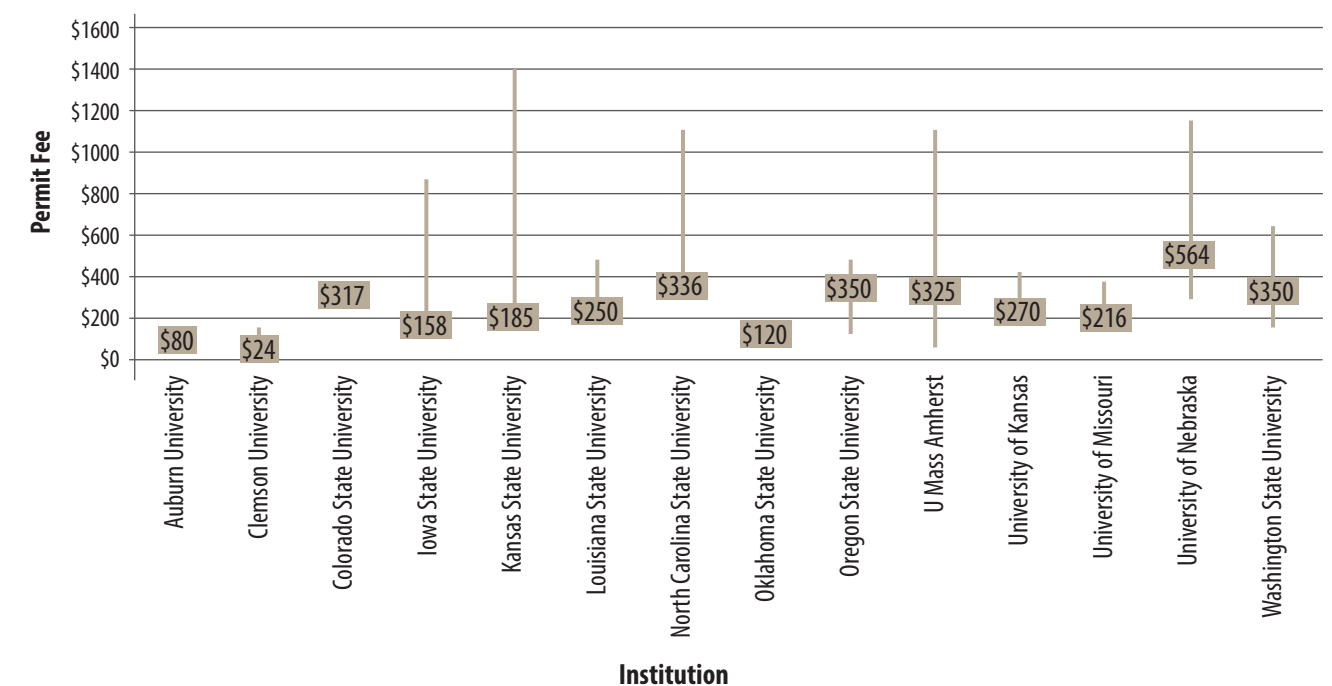
Key Parking Findings

- **Parking Permit Fees:** Parking permit fees at Kansas State University for the 2015 – 2016 school year are below the average prices from peer institutions as indicated in the graphs. The graphs show the range of permit fees and identify the average permit fee for each institution. The average student parking permit among the peer institutions is \$206 and the average faculty/staff permit is \$258.
- **Zoned Parking:** Almost all peer institutions vary parking permit fees to some degree based on the location of parking lots relative to the areas of highest demand. Several universities have implemented a zoned parking system. The zones provide a range of pricing options for students, faculty, and staff, rewarding those who are willing to park in less convenient locations.
- **Commuter Parking:** Many peer institutions provide commuter parking on the perimeter of the campus and utilize the campus transit system to shuttle commuters to the core of campus. These commuter parking lots typically have a reduced permit fee, or do not require a parking permit. Stadium parking lots are frequently used as commuter parking.
- **Parking Ratio:** One method to quantify campus parking is to compare the ratio of parking spaces to the number of students enrolled on the campus. The ratios of the peer institutions vary as shown in graph. Each university has unique characteristics that affect the ratios. For instance, at Iowa State University, the commuters park off campus. The average ratio of the peers is about 0.50 students per space, which is not uncommon for a walkable urban campus well

Student Parking Permit Fees



Faculty/ Staff Parking Permit Fees



served by transit. Kansas State University has a ratio that is slightly higher than the average.

Key Transit Findings

- **Transit Operating Structure:** The peer institutions utilize a range of transit operating models. Some transit systems only serve the university campus while others serve both the campus and city-wide to provide service to residential and commercial hotspots. In the case of campus and city coordinated systems, the lead agency can be the university (i.e. Oklahoma State University) or the city agency (i.e. Washington State University). In cases where the university financially supports the city-wide transit system, students can typically travel system-wide at no charge.
- **Campus Vehicle Restrictions:** All peer institutions allow buses to utilize the internal campus streets for transit service. Eleven of the thirteen universities also have some form of campus vehicle restriction to reinforce a pedestrian-friendly environment. Common vehicle restriction types include an identified campus core area, along designated corridors, or pedestrian malls. However, the majority of the transit services authorize buses to use the restricted areas in order to improve on-time performance and customer service in the campus core.
- **Days and Hours of Service:** Campus transit systems typically operate Monday through Friday from 7:00 AM - 6:00 PM with a service frequency of ten minutes or less to meet peak demand. Reduced service is often available during the evening or weekends. Systems also operate at reduced service during university holidays and breaks. The University of Nebraska utilizes on-call service for some perimeter parking lots and after peak operating hours.
- **Technology:** Nearly all universities utilize GPS tracking available via mobile devices or the internet to provide real-time transit service information to improve customer service and reliability.
- **Student Transit Fee:** Most universities charge a student transit fee per semester as shown in the graph. As a result, students, faculty, and staff can utilize the transit service at no additional cost. Fees range from as low as \$15.00 per semester up to \$131.00 per semester. Of the universities that charge a student transit fee, the average fee is about \$50.00 per semester. Establishing a relationship between enrollment and revenue also allows the transit system to expand service as needed to accommodate future growth and demand.

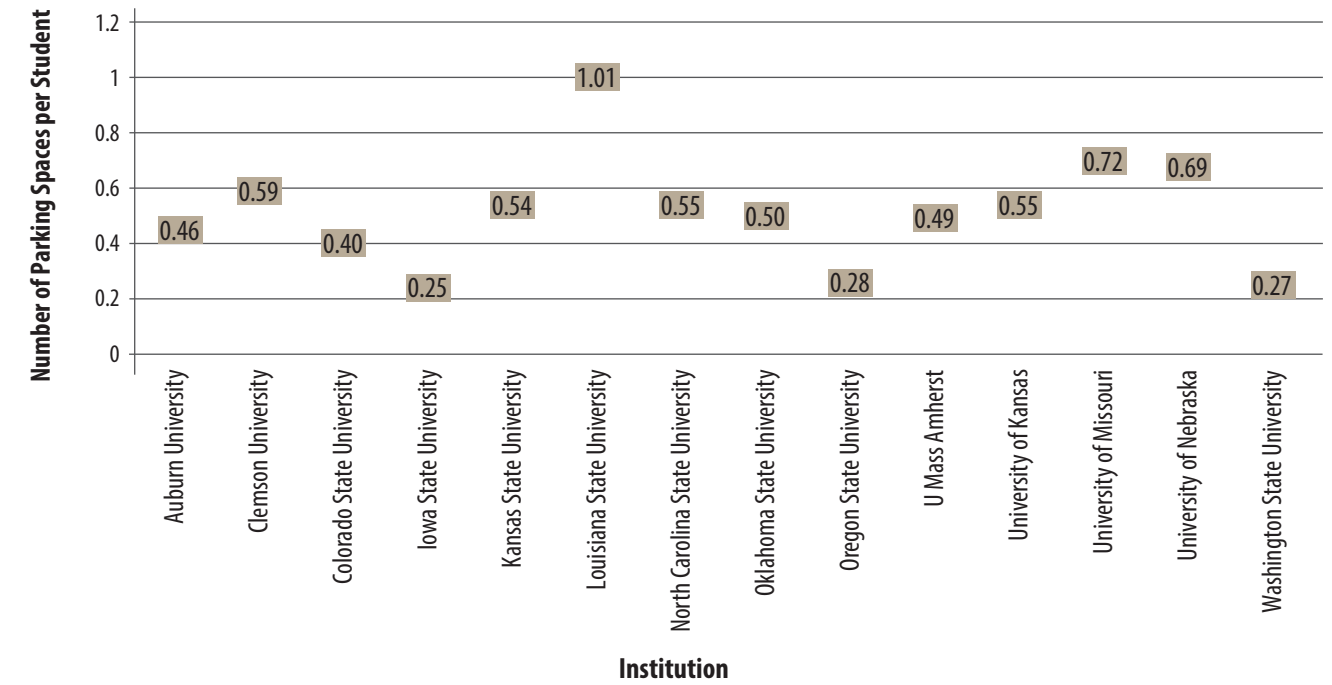
- **Transit Revenue Sources:** Typically, the revenue generated by student fees does not entirely cover the operating cost of the transit system. Universities range in their approaches to providing additional revenue. Approaches include utilizing university parking revenue, farebox revenue from the general public, state and federal transit funds, local utility or transportation taxes, or other university funds to subsidize the system. The operation model of the transit system (campus vs. campus and city-wide) affects the sources available for funding.
- **Innovative Operating Methods:** The University of Massachusetts - Amherst has found success in employing students as staff in order to keep operating costs low. About 95 percent of the 180 staff members are students. As a result, the transit system operates at \$50.00 per hour compared to regional peers, which operate near \$85.00 per hour.

Master Plan Impacts

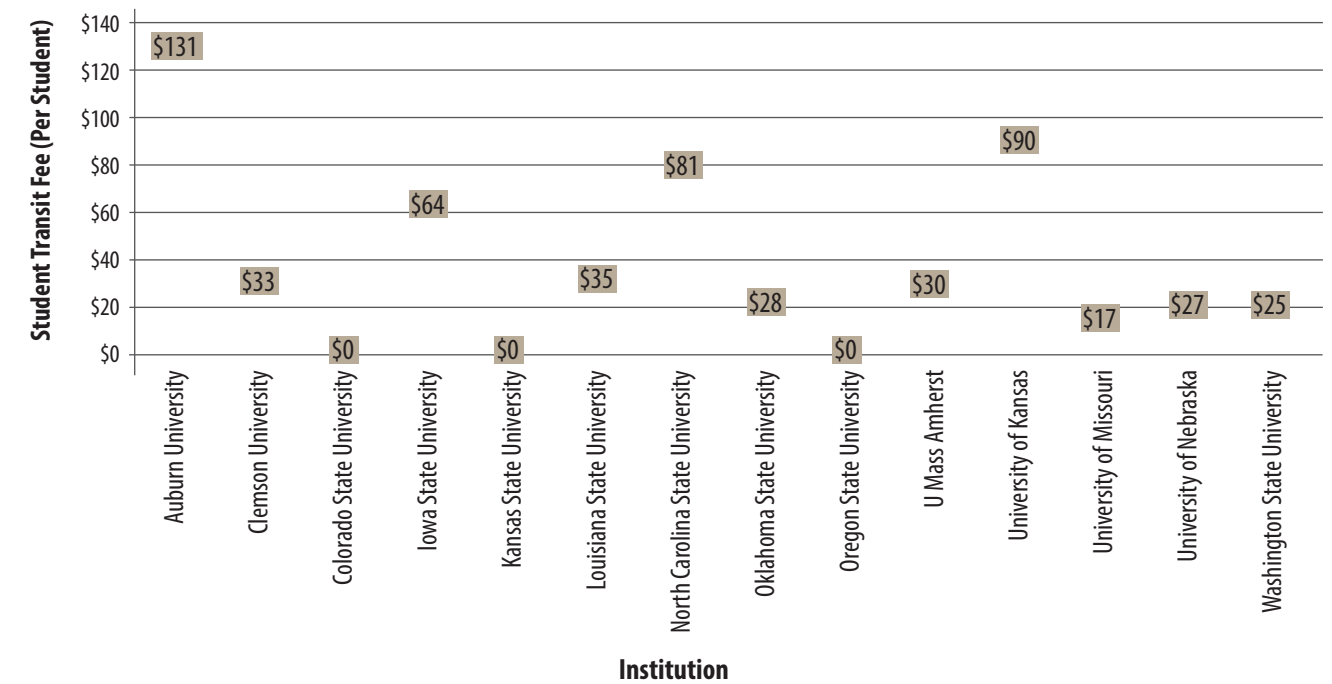
The campus master plan includes several items that will significantly affect parking on campus. The most significant impact is that several new facilities are to be constructed on the site of existing parking lots in the core campus area. The parking removed is to be replaced in a new parking garage in the northwest corner of North Manhattan Avenue and Claflin Road, and at the existing parking lot on the east side of Bill Snyder Family Stadium. A new transit route is to be established that will connect the core campus to these parking areas on the periphery.

It will take time to implement the parking changes recommended in the master plan; however, several projects that will impact the parking supply will be constructed in the next few years. Parking and transit recommendations are needed for the short term and that are consistent with the long term plan. The following sections describe the timing of specific recommendations for the next several years.

Campus Parking Ratios



Student Transit Fees



2015 – 2016 School Year Impacts

Construction of a new chiller plant began in the spring of 2015. During construction, 200 parking spaces north of Weber Hall in lot B16 will be used for construction vehicles for the school year. At the time of data collection, lot B16 had a capacity of 271 spaces, with a peak occupancy of 215 (79%). Based on the data collected, there will be capacity in nearby lots B17 and B18 to accommodate the loss of parking in B16; however all three of these lots will be near capacity at peak times. During parking data collection, equipment and trailers were observed parking in lot B18. To maximize the capacity of the lot, these vehicles should be moved out of the lot.

To increase availability of parking in “O” lots, the “JO” permit should be discontinued. Jardine Apartment residents already have parking spaces allotted for them on campus in J lots. As such, it is not necessary to allow them access to the “O” lots as well. This will be a major change for Jardine Apartments residents, however they do have options to travel to destinations on campus. They can walk, bicycle, or ride transit.

In conjunction with the chiller plan project, Mid-Campus Drive will be reconstructed as a pedestrian mall between Lovers Lane and Old Claflin Road. The pedestrian mall will be constructed as a 26-foot wide concrete corridor. The pedestrian mall will be closed to public travel, however emergency and service vehicles will be able to travel on the corridor. This change will impact the Park and Ride route, as it travels primarily on Mid-Campus Drive.

The Park and Ride should be able to continue operating on Mid-Campus Drive after it is converted to a pedestrian mall. Since the pedestrian mall has been designed to accommodate emergency and service vehicle traffic, the 20-passenger cutaway buses should not have any difficulty traveling

through the corridor. It should be noted that other peer institutions permit buses to operate on designated corridors where vehicle use is typically restricted.

Allowing transit to operate along the pedestrian mall is a safety concern since pedestrians may not anticipate vehicle traffic on Mid-Campus Drive. Travel speeds of buses on the corridor will be slow, allowing ample time for bus drivers and pedestrians to observe and react to conditions. Currently, the Park and Ride route is not significantly hindered by pedestrian traffic on Mid-Campus Drive. Nonetheless, the current Park and Ride schedule can shift approximately five minutes in an effort to avoid class change times and reduce pedestrian conflicts during peak times. This is most significant near Hale Library and Willard Hall. The operation of the Park and Ride on the pedestrian mall can also serve as a trial to assess the safety and operational impacts of transit on the pedestrian mall. The outcome of the trial will have implications on future route options as the campus transit service expands.

2015 – 2016 Recommendations

- Move all equipment and trailers out of Lot B18
- Discontinue sale of “JO” parking permits
- Operate Park and Ride route on the Mid-Campus Drive pedestrian mall
- Adjust Park and Ride schedule to avoid peak pedestrian conflicts during class change times

2016 – 2017 School Year Impacts

Two large projects will be complete for the 2016 – 2017 school year. The new College of Business Administration (CBA) building and Wefald Hall will open. Both buildings will have a nominal effect on the parking supply, as few spaces will be added. The parking data collected already accounts for parking displaced by the two buildings, because those areas were closed when the parking supply and occupancy data was collected.

The demand for on-campus resident parking will increase for the 2016 – 2017 school year. Wefald Hall will add 540 beds for on-campus residents. The initial occupancy of Wefald Hall is not known but, there will be no more residence hall contract students living at the Jardine Apartments when Wefald hall opens. Based on current parking permit sales, 75 percent of on-campus residents purchase a parking permit. Therefore, at least 400 parking spaces are needed for Wefald Hall at full occupancy. The CBA building will have a minimal effect on parking demand in the short term, as the college is already on campus and will grow into the new space over time.

There is no parking available adjacent to Wefald Hall that can accommodate the new demand. Residents of the Kramer complex (residence halls adjacent to Wefald Hall) currently park in lots D1, B2, B3, and B17. These lots are between 1/3 and 2/3 of a mile from the Kramer complex. This distance is an existing concern of these residents since they must walk to get to and from their vehicles. There is no capacity available in lots D1, B2, or B3. Chiller plant construction will be complete in 2016, restoring the capacity of lot B16 to 200 spaces, which will increase availability in the adjacent lots B17 and B18. Even so, there will only be about 200 spaces available in those lots. The result is between 200 and 400 additional parking spaces will need to be provided for Wefald Hall residents.

The only area on campus with significant available parking will be near Bill Snyder Family Stadium. The condition of the pavement at the stadium will not support everyday vehicle traffic and will need to be reconstructed before it is used on a daily basis. Parking at the east stadium lot is not a desirable option for residence hall students, as the lot must be vacated before men’s and women’s basketball games and football games. Therefore, the east stadium lot is only an option for commuter parking. Coordination with the Athletics department will be essential to make sure that the commuters have exited the lot in time for game traffic to arrive. Commuter parking could be consolidated to the east stadium lot, allowing lot B18 and a portion of lot B17 to be designated for residence hall parking. Residents would then be able to ride campus transit to and from their vehicles parking in these lots. Another option would be to designate more space in the D1 lot for residents, however it would not be served by transit. Commuters currently parking in the D1 lot could be relocated to the east stadium lot and/or the parking garage. Allotting more spaces in the garage to commuters would require a policy change.

Ongoing coordination with the Athletics Department will be essential to ensure that parking is provided for commuters and for basketball operations. The parking lot is used on a daily basis for the Basketball Training Facility. On basketball game days, a portion of the lot is needed for Athletics staff, media, and special guests.

Zoned Parking

Relocating commuter parking to the east stadium lot will be a significant change for many Kansas State University students, faculty, and staff. For a remote parking strategy to be successful, there should be some benefit for drivers who choose to park in the commuter lots. The benefit must offset the additional time and inconvenience that will be created.

A zoned parking system of varying fees based on proximity to the campus core will provide a financial benefit to commuters who park in the east stadium lot. The zoned system would involve dividing the campus into areas or zones of several parking lots. Permits for each zone would have a price that is based on how desirable it is to park in the zone. The zones closest to the campus core would be most desirable, and therefore have the highest permit fees. The remote commuter parking permit would have the lowest price in order to provide a financial benefit to those who park in the remote lots. The zoned parking figure illustrates how this system could apply to Kansas State University.

The zoned system will do away with the current system of parking permits. Students, faculty, and staff will generally be able to purchase the permit for the zone that meets their needs. Not every zone will need to be made available for purchase to all customers. For example, permits for certain zones may only be sold to on-campus residents, such as the Jardine Apartments area. The proper ratio of employee and student parking in a zone can be controlled through the number of permits sold to each group.

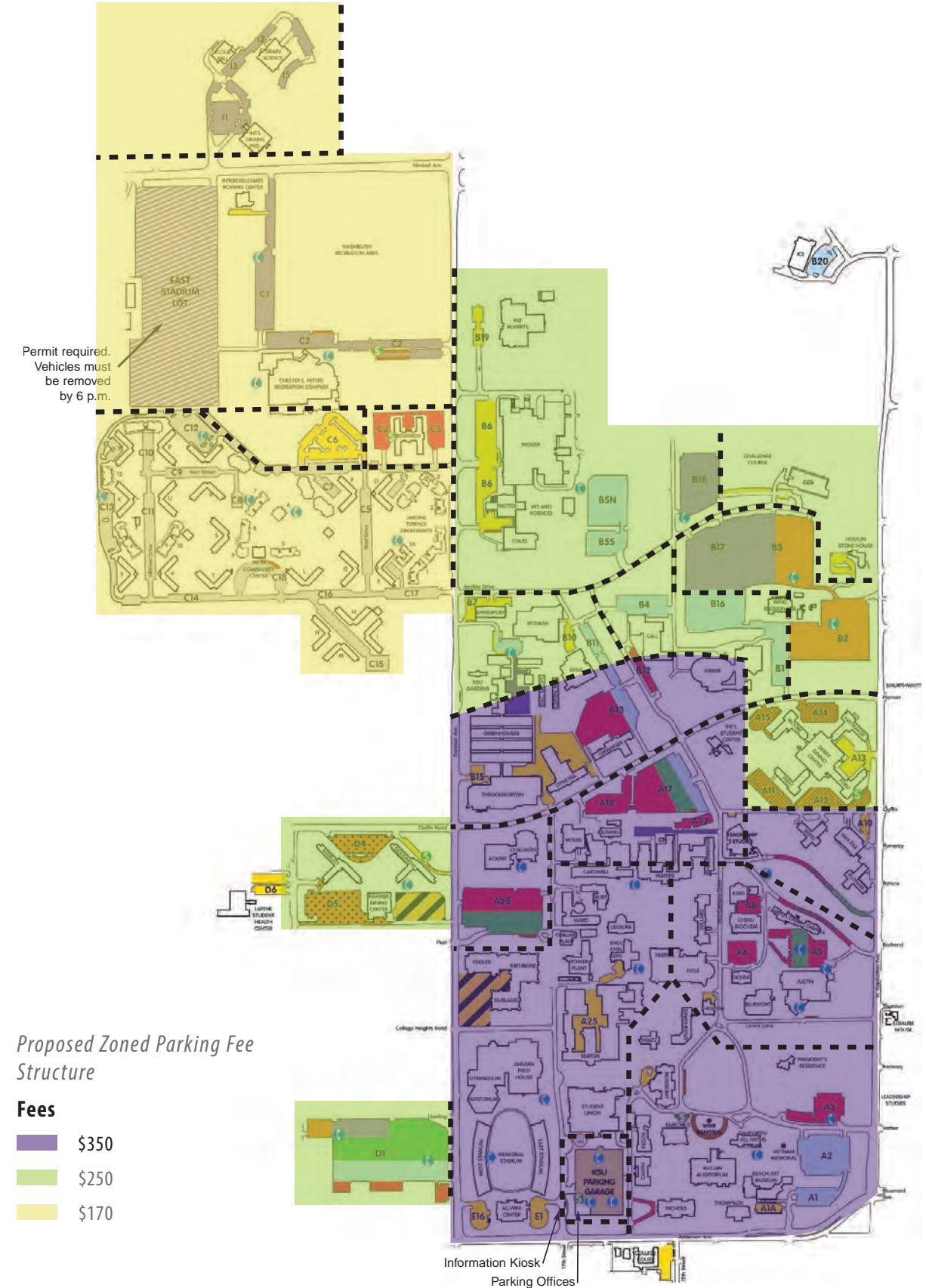
To make the higher priced zones in the campus core desirable, these zones cannot be oversold as they are currently. Drivers who hold these permits must be able to find a space in the zone they purchase. The larger commuter lots can be because the demand does fluctuate over the course of the day, since not all commuters are on campus at the same time each day.

Customers will benefit from a zoned parking system in several ways. First, they will have the choice to buy the permit that meets their needs. Next, reducing the oversell ratio in the core campus will increase the probability of finding a parking space in those lots at peak times. Lastly, since zoned parking will make it easier to find an available parking space, vehicle circulation through parking areas will be reduced. Time required and stress experienced while searching for a parking space will be reduced as well.

The University will need to monitor zoned parking regularly to maintain a proper balance between the number of available parking spaces and number of permits sold. The price of permits will also need to be evaluated annually to establish the permit fee for each zone. The permit fee can also affect the balance of permits sold in each zone.

2016 – 2017 Parking Recommendations

- Allocate 400 spaces in lots B17 and B18 for Wefald Hall residents
- Reconstruct pavement at the east parking lot of Bill Snyder Family Stadium for use as a commuter parking lot
- Implement a zoned parking system



Campus Transit

The stadium is a significant distance from the core campus and will require transit service to connect commuter parking to the core campus. The existing Park and Ride shuttle route will not be convenient to the commuters parking in the east stadium lot. Since there will be no more residence hall contract students living in Jardine Apartments, there will be no need for the Jardine shuttle service to continue. This will be an opportune time to make changes to the campus transit system.

A comprehensive transit route that connects the campus should be established. Such a route is referred to in this study as the campus circulator. Dependent upon the outcome of the trial of transit operation on the pedestrian mall, two options are available for the campus circulator. Option 1 utilizes perimeter streets to circulate around campus. In contrast, Option 2 utilizes internal campus streets, including the Mid-Campus Drive pedestrian mall. The internal streets route for the circulator may no longer be an option when bus headways cannot be scheduled to avoid class change times on Mid-Campus Drive. A description of each option is provided in the following paragraphs.

2016 – 2017 Transit Recommendations

- Discontinue Jardine shuttle and current Park and Ride service
- Begin Campus Circulator and Union Express routes
- Construct transit shelters at all stops
- Construct bus turn-outs on Denison Avenue at the Kramer Complex stop

Campus Circulator Option 1 (Perimeter Streets)

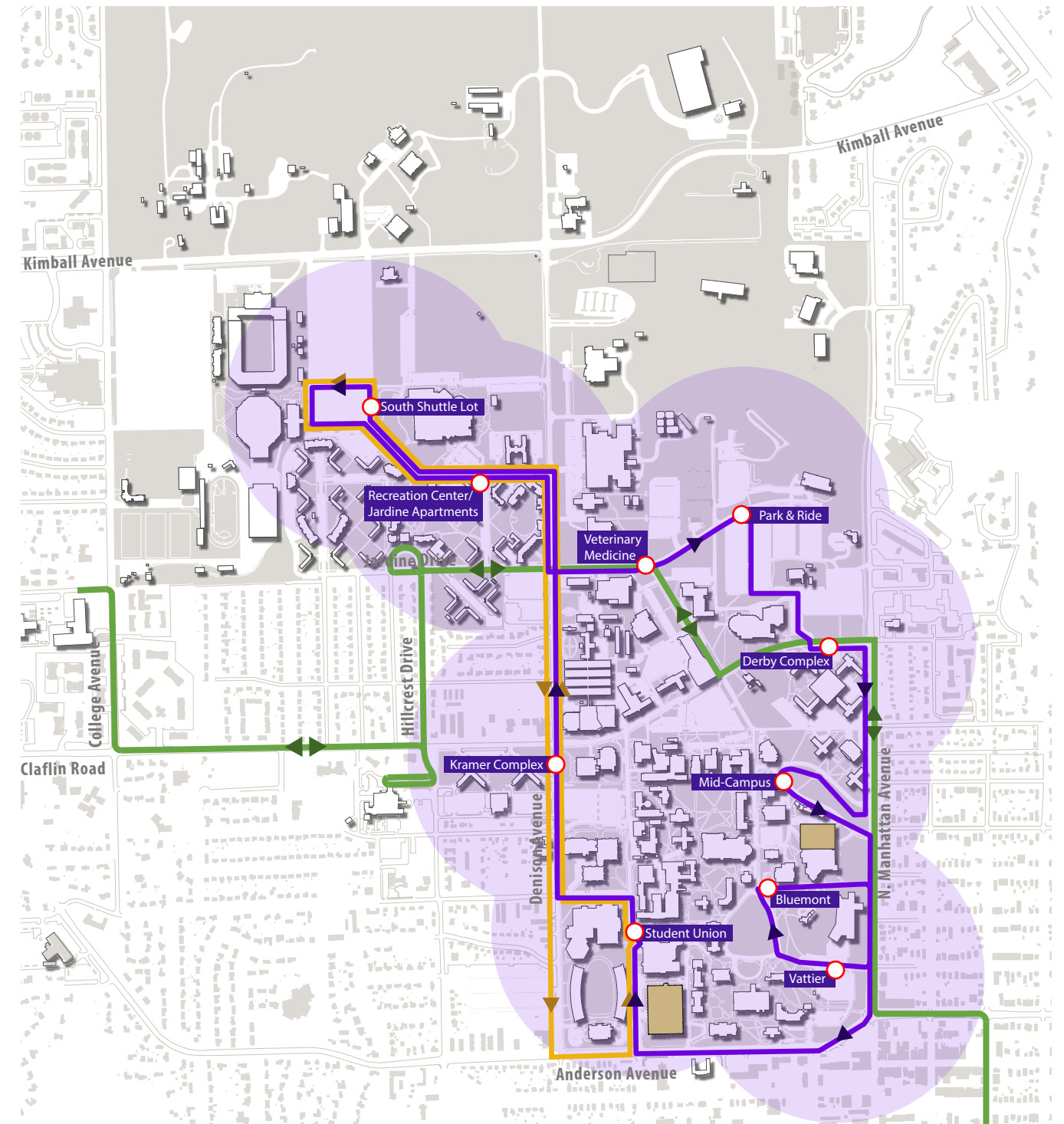
Option 1 is a 4.7-mile route with ten transit stops. The clockwise route, uses perimeter streets to serve the east stadium parking lot and several locations within the campus core. This route uses ten transit stops that are situated to provide convenient service to major campus destinations within a five-minute walking distance. Option 1 travels on several of the access roads around the campus in order to serve stops internal to the campus. Four 20-passenger cutaway vehicles will be sufficient to meet the projected transit demand during peak times.

The route for Option 1 includes some duplication along North Manhattan Avenue to account for one-way eastbound traffic flow on Lovers Lane. If the traffic flow on Lovers Lane were reversed to be in the westbound direction, the route length and running time could be reduced. This could reduce the operating cost of the route, as three cutaway vehicles would be sufficient. Reversing the direction of travel will also affect which side of the street the transit stop is on.

One-way flow in the westbound direction may be advantageous on Lovers Lane if a raised median is constructed on North Manhattan Avenue at the Vattier Street intersection. This raised median has been considered before and would improve traffic and pedestrian safety at the intersection. If constructed, the median would eliminate northbound left-turn movements into campus from North Manhattan Avenue. The northbound left turns would then be able to be accommodated at Lovers Lane.

Campus Circulator Option 2 (Internal Streets)

Option 2 is a 4.1-mile route with nine transit stops. The clockwise route, uses internal campus streets, including the Mid-Campus Drive pedestrian mall, to serve the east stadium parking lot and several locations within the campus core. Nine transit stops



Transit Plan Option 1 - Perimeter Streets

- Campus Circulator Route Option 1
- Proposed modification to existing ATA route
- Union Express Route
- Transit Stop
- 5 minute walk radius
- Parking Garage

are situated to provide convenient service to major campus destinations within a five-minute walking distance. Although Option 2 provides the same level of service in terms of campus coverage as Option 1, the route headway is shorter due to the shorter travel distance and one less stop. Therefore, the operating cost of Option 1 is slightly higher than for Option 2. Three 20-passenger cutaway vehicles will be sufficient to meet the projected transit demand.

Either option for the campus circulator begins to elevate the University to the level of service provided by many of the peer institutions. Connecting campus destinations reduces dependence on personal vehicles for intra campus trips. This will create a more pedestrian and bicycle friendly environment and enhance mobility for all users across campus. The circulator system will also better connect the Kramer Complex with parking in lots B17 and B18.

Union Express Route

The Union Express route is a 3.0-mile route with three transit stops, and is intended to provide additional capacity for passengers during peak times when commuters are arriving at or leaving campus. This route provides direct service for commuters rather than circulating around the entire campus. The route travels primarily along Denison Avenue to serve the east stadium parking lot, the Kramer Complex, and the Student Union. Two 20-passenger cutaway vehicles will be sufficient to meet the projected transit demand.

Transit Shelters

Transit shelters should be provided at each stop to protect riders from the wind and precipitation while they wait for buses to arrive. Shelters will enhance the comfort of transit passengers in all weather conditions. The average three- or four-sided transit shelter costs about \$9,000. It should be noted that the costs of shelters can vary significantly depending on the types of materials and features that are included in the transit shelters.

Transit shelters also offer an opportunity to coordinate shelter design with campus branding,

wayfinding, signage, and architecture. Transit shelters can easily incorporate sculptural art and lighting effects to reflect campus pride while also being highly visible, informative, and accessible to riders. Security features that should be included in the design of the shelters are lighting, emergency phones, and security cameras. Technology features such as electronic message boards can also be included. Message boards can be used to display a variety of information to transit riders including real-time bus arrival information.

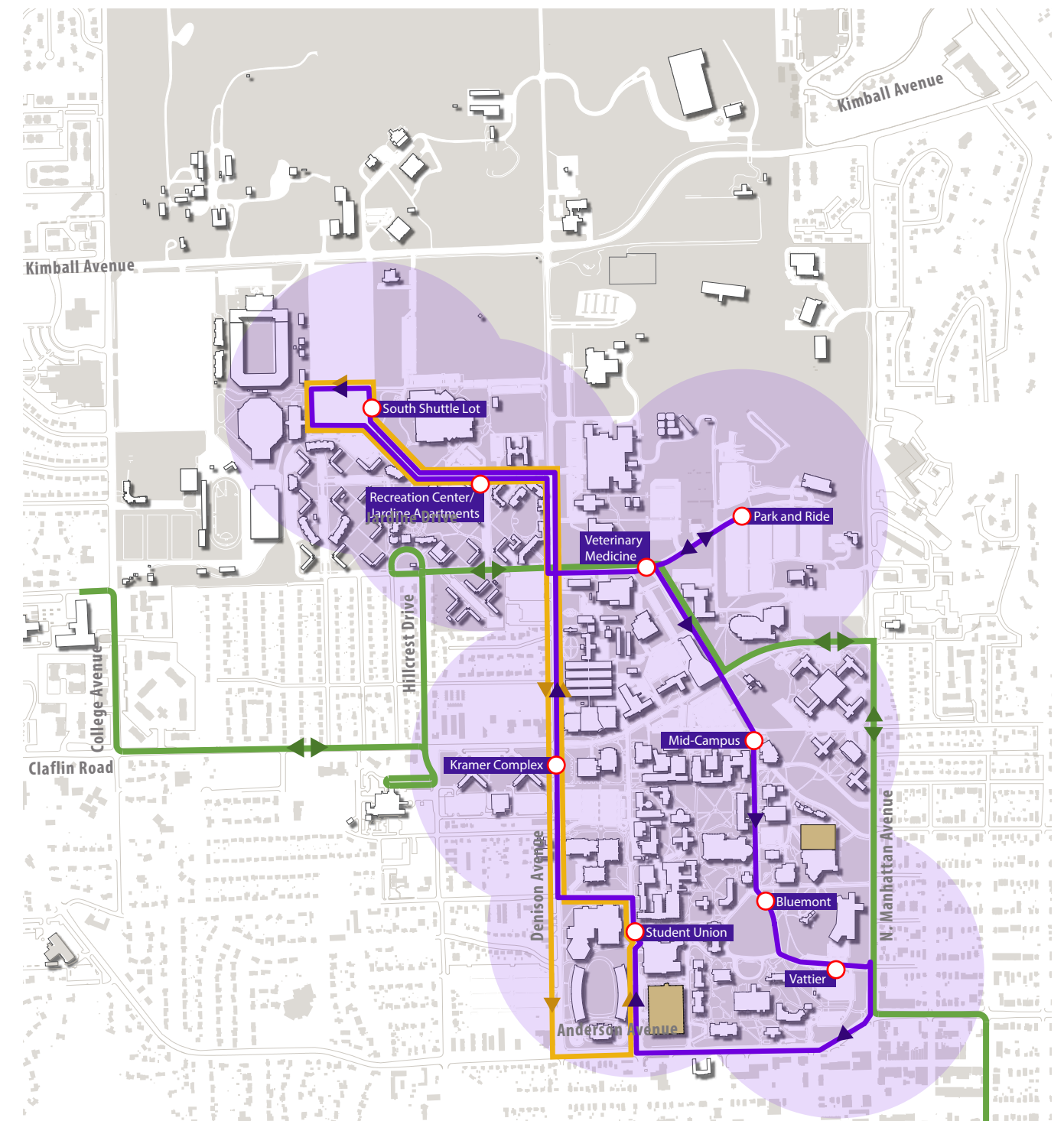
The transit stop at the east stadium lot will need to accommodate a large number of commuters during peak times in the morning. A simple three- or four-sided shelter will not provide enough space. A larger shelter should be considered. The cost of a larger transit shelter will vary significantly depending upon desired capacity and design. A design that is expandable in the future should be considered to allow the shelter to be appropriately sized for the ultimate ridership at the stop.

Bus Turn-Outs

Bus turn-outs should be considered on each side of Denison Avenue at the Kramer Complex stop. The turn-outs will allow traffic to bypass buses that are stopped along this heavily traveled corridor. An average cost for a turn-out varies significantly based on many factors, but \$40,000 per location is a sufficient estimate of the pavement and sidewalk construction that is needed.

Technology

Technology can play an important role in the reliability of transit service. Providing accurate arrival time information can minimize wait times for passengers, which leads to a more convenient and pleasant transit experience that can increase ridership. Buses should be equipped with GPS tracking features that enable automatic vehicle location (AVL). AVL systems can be used to allow transit riders to track buses in real time online or on their phone and mobile devices. Nearly all peer universities use a form of real-time technology to enhance transit service.



Transit Plan Option 2 - Internal Streets

- Campus Circulator Route Option 2
- Proposed modification to existing ATA route
- Union Express Route
- Transit Stop
- 5 minute walk radius
- Parking Garage



Other Improvements

Justin Hall Parking Garage

The amount of parking removed by the master plan requires more than the east stadium parking lot to replace what will eventually be removed. More than one parking garage will be needed on campus. Most of the land available for construction of new parking garages is located in the north campus area. With a zoned parking system, the zone for the north campus area will have a lower cost for parking permit fees, as it will have a lower demand for parking than in the core of campus. The lower parking permit fees combined with the high construction cost of a parking garage makes it difficult to fund garage construction with parking permit revenues.

An alternative location that should be considered for a parking garage is on the site of lot A5, north of Justin Hall. This garage could be constructed with four levels accommodating 800 cars. The garage would replace the existing 200 car parking lot, for a net gain of 600 parking spaces.

There are several advantages to a garage on this site. The location is within 500 feet of nine academic buildings in the core of campus. Those who park at this garage will have a short walk to destinations in the core campus. A garage at this location would also be screened in nearly all directions by adjacent buildings or foliage. Access to the garage can be provided from North Manhattan Avenue. The topography of the site will also allow for another access point on the second level of the garage from Campus Creek Drive.

To accommodate traffic flow in and out of the garage, Campus Creek Drive will need to be realigned to intersect North Manhattan Avenue at the Bertrand Street intersection. The intersection will be a good candidate for traffic signal installation for several reasons. First, it is the intersection of two collector

streets. Second, projected traffic volumes exiting the garage are likely to satisfy the warrants for a traffic signal installation. A traffic signal will enhance safety for pedestrians crossing North Manhattan Avenue. Lastly, the intersection provides good spacing from the adjacent signalized intersections on North Manhattan Avenue (roughly 1,500 feet). A signal at the Bertrand intersection should be coordinated with the adjacent signals to provide progression for through traffic on North Manhattan Avenue.

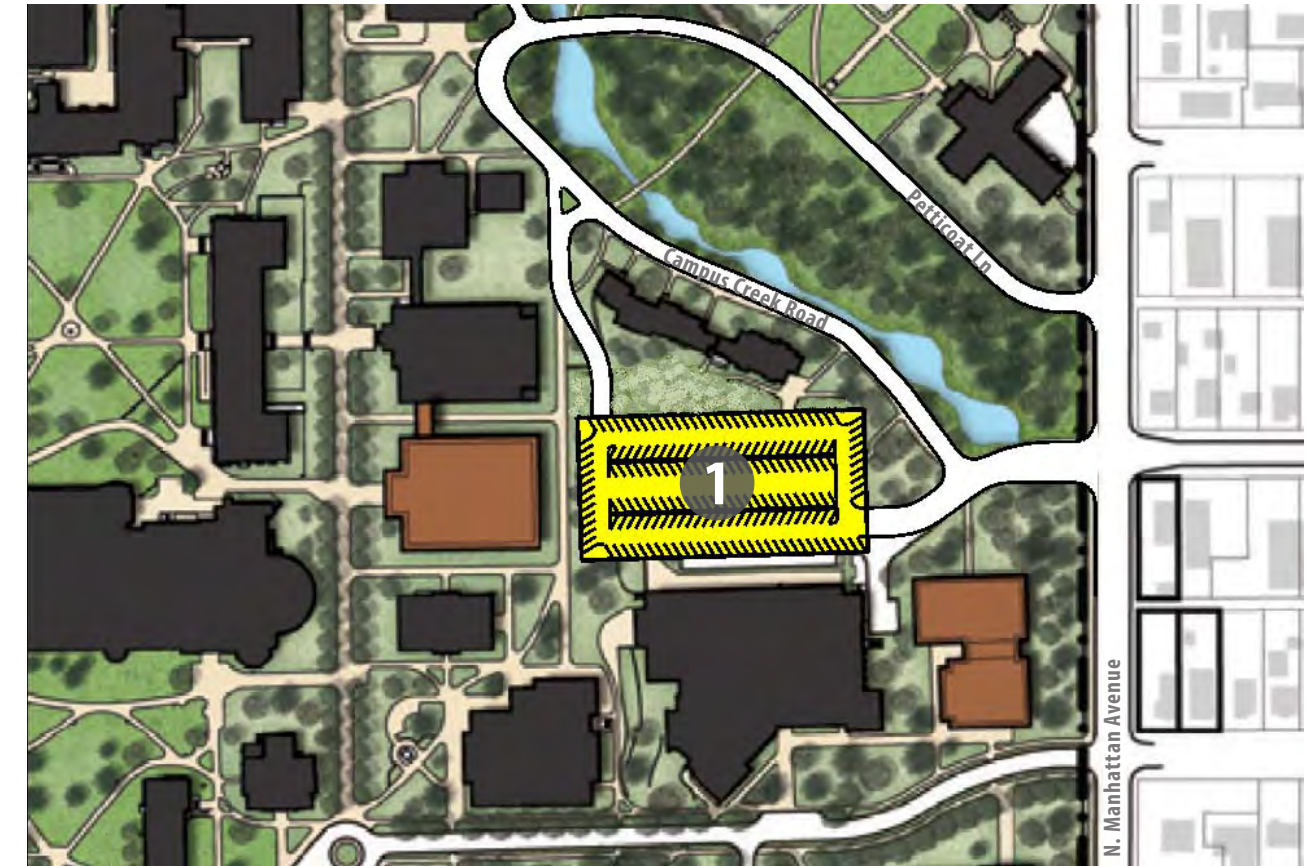
Parking Lot Expansion near Rowing Center

An alternative to using the east stadium parking lot for remote parking would be to expand existing parking lot C1 in the area just south of the rowing center along Kimball Avenue. The C1 lot can be expanded to the west to create approximately 500 new parking spaces. This location is currently has a gravel and turf surface that is used for football game day parking only. Therefore, parked vehicles would need to be removed from this lot before home football games, but parking in this lot would not be in conflict with basketball games. New pavement for a parking lot on this site would require stormwater detention for the new impervious surface. The most likely solution would be in cisterns under the lot.

Expanding lot C1 would be an interim step in providing ample parking for the campus. Eventually the demand for commuter parking will require that the east stadium parking lot is used. However, the C1 lot expansion would allow the University to delay reconstruction of the east stadium lot, and provide more flexibility for parking in the area since the C1 lot is not needed for basketball games.

Potential Modifications to City-Wide Fixed Transit Routes

Increasing ridership on the city-wide fixed routes could decrease parking demand and traffic on campus. Each of the routes passes large existing parking lots throughout the city. There may be opportunities to create park and ride service from



1 Alternative Garage Location: North of Justin Hall (shown over 2012 Master Plan)

these lots. For example the Red (Candlewood) and Green (Dickens) routes pass by CiCo Park, Manhattan Town Center, and Dillon's East. The Blue (Bluemont) and Orange (Fremont/Osage) routes pass by Target, the Westloop Shopping Center, Kansas State University Foundation, HyVee, and Walmart.

Modifications to the ATA's Green route should also be considered. Currently the green route travels between Downtown and the Manhattan Area Technical College. The route travels through campus, with stops at the Derby complex, Call Hall, and Edwards Hall. The route also stops just west of campus at the Riley County Health Department. The Red route makes this same stop. If the Green Route was modified to stop at Lafene Health Center instead, it would be convenient to Kramer complex.

This would provide an east/west transit connection across campus, linking the residence hall complexes and Lafene Health Center. It would also be beneficial for the Green route to stop in Aggieville, as it passes through the commercial district.

Neighborhood Parking Recommendations

There will be drivers who seek out other opportunities to find convenient parking as the supply decreases in the core of campus and the price of parking permits increases. To deter students, faculty, and staff from parking on the street in the neighborhoods adjacent to campus, the City should consider increased fines for illegal parking in the surrounding residential parking zones. Fines could be escalated for repeat offenders if the officers issuing tickets had prompt access to a database of previous violations.

Cost of Improvements

East Stadium Parking Lot

The reconstruction of the east parking lot of Bill Snyder Family Stadium will be a significant parking expense. The level of reconstruction needed is assumed to be a full depth reconstruction of the pavement, which is estimated to cost \$2,000 per space. The lot has approximately 1,750 spaces for a total cost estimate of \$3,500,000. This cost does not include any storm water management solutions for this existing parking lot.

In the short term, reconstruction of only a portion of the lot would be possible, as the entire lot will not be needed as a commuter lot until closer to the estimated build out of the master plan. If that is the case, the southern portion of the lot adjacent to the transit stop should be constructed first. Another alternative would be to expand lot C1 as mentioned previously. The cost to expand lot C1 is estimated to be \$1,100,000. This estimate includes stormwater detention in cisterns below the lot.

Justin Hall Parking Garage

Construction of a parking garage at Justin Hall itself is estimated to cost as much as \$20,000,000 based on estimates of \$20,000 to \$25,000 per parking space. Roadway improvements would be required in conjunction with the garage. Campus Creek Drive would need to be widened and realigned. A traffic signal installation and associated interconnection would also be required. While this garage is not needed in the next few years, it should be programmed as funds become available.

Transit Service

A number of capacity assumptions were utilized when developing estimates for the operating and capital costs for transit service. Transit service is expected to be offered during the fall and spring semesters, equating to 160 weekdays when school is in session. To accommodate the morning and evening peak of commuters, two hours of peak

service is expected from 7:30 AM - 9:30 AM with an additional two hours of peak service from 4:00 PM - 6:00 PM. During peak service, service frequency is about 10 minutes. Eleven hours of non-peak service would also be offered, establishing transit service hours from 6:00 AM to 9:00 PM. Non-peak service frequency is about 15 to 20 minutes.

Based on the capacity assumptions and desired service levels, estimates for the transit operating and capital costs are outlined in the appendix. Capital costs do not include estimates for transit storage, and maintenance facilities. These costs will be dependent upon the University's decision to operate the transit service in-house or through a contracted operation.

Summary of Short Term Improvement Costs

The cost of the short-term improvements identified in this study are summarized in Table 4. As mentioned in the other improvements section, there are alternatives to reconstructing the entire east stadium parking lot in 2016. A portion could be reconstructed in the short term, and the remainder of the lot can be deferred. Parking lot C1 can also be expanded to provide the commuter parking needed in the short term.

Funding Opportunities

Parking Revenue

The zoned parking recommendations would be expected to increase parking revenue. Table 5 illustrates the revenue that would be projected from a zoned parking system. The proposed permit fees shown in the table are estimated to be lower than that of many peer institutions. Based on the limited sale of preferred and reserved spaces it is not known if higher price points can be supported. The price of the reserved spaces was held constant in the table below for comparison purposes. It is assumed that reserved spaces would continue to be sold with the zoned parking system. The inventory includes the east stadium parking lot in the yellow zone, and a slight increase in parking permit sales to account for campus growth.

Table 4: Short Term Parking and Transit Improvement Costs

Improvement	Estimated Cost		
	2015-2016	2016-2017	Beyond 2017
East Stadium Parking Lot Reconstruction		\$3,500,000	
Justin Hall Parking Garage Construction			\$13,000,000
Parking Lot C1 Expansion			\$1,100,000
Annual Transit Operating Costs	\$188,400	\$281,700	Ongoing
Annual Transit Capital Costs		\$86,500	Ongoing
Total	\$188,400	\$3,868,200	\$14,100,000

Table 5: Zoned Parking Revenue Projections

Permit Type	Parking Inventory by Zone	Permits to be Sold for 2016-2017	Proposed Permit Fee	Proposed Permit Revenue
Purple Zone	3,420	3,420	\$350	\$1,197,400
Green Zone	5,044	5,044	\$250	\$1,261,000
Yellow Zone	4,028	4,772	\$170	\$811,240
Reserved	511	511	\$400- \$1,300	\$291,400
Total	13,359	13,747		\$3,560,640

The zoned parking fee projections could provide an additional \$700,000 annually. This increased revenue will be necessary to fund the short term and long term parking improvements needed to support the changes proposed in the master plan. It is not likely that parking revenue can fund transit improvements as well, unless the permit fees are higher than indicated in Table 5. Other funding sources must be considered to fund transit.

Student Transit Fee

As discussed in the Peer Institution section, most universities charge a student transit fee to cover a portion of transit operating costs. Student transit fees ranged from as low as \$15.00 per semester up to \$131.00 per semester. Based on the estimated annual operating and capital costs, a student transit fee of less than \$10.00 per semester would fully fund the campus circulator and union express service during the 2016 – 2017 school year. Transit operating costs will increase as the number of commuters parking in the east stadium area increases, which should be taken into account if such a fee is considered.

Faculty/Staff Contribution

A significant portion of the transit ridership is expected to be faculty and staff that park at the east stadium commuter lot. Therefore, the University could consider some type of faculty/staff contribution to the transit system. This could be in the form of a small payroll deduction (rather than purchasing a campus parking permit) or included in the cost of a parking permit for the commuter lots. The tax benefits available for commuters should be considered. Federal tax law stipulates that employers can allow employees to use pretax dollars to pay for transit passes or subsidize employees transit passes.

At many of the peer institutions, fee-paying students and faculty/staff are eligible to ride city-wide systems at no additional charge, another potential benefit for both the University and the city's transit system as it continues to grow. This type of partnership should be established as student and/or faculty/staff fees are considered.

Other Funding Sources

Transit Grant Programs

The U.S. Department of Transportation currently administers grant programs for transit related capital improvements. These funds can be used for transit shelters and stops, bus turn-outs, and buses. The federal contribution can be as high as 80 percent of the cost because Manhattan is classified as an urbanized area.

Naming Rights / Advertising

Revenue from naming rights or advertisements is another possible source of revenue. Recognition plaques or advertising space can be integrated into vehicles, transit shelters, benches, and other transit amenities such as trash cans. Advertising is a common source of additional revenue for many campus and municipal transit systems.

Farebox Recovery

While revenue from the public could be a relatively small portion of revenue, farebox recovery offers another potential funding source. With the University supporting the campus transit system, it is not uncommon to charge the public a small fare for use of the service.

Private Partnerships

In addition to the existing city-wide and campus routes, ATA operates an additional route for the University Crossing Apartments that shuttles students from the apartments to the Student Union. The route is funded as a public deviated route through state and federal funding with the local match by the University Crossing Apartments. University Crossing Apartments funds the route because the service is marketing tool and amenity for residents. As demonstrated by the University Crossing route, there is an opportunity to collaborate with other apartment complexes to enhance transit service with high frequency fixed routes between the city's residential hotspots and the University campus.

Other Innovative Methods

As discussed in the comparison of peer institutions, another approach to reducing operating costs is to employ part-time staff. The University of

Massachusetts - Amherst has had success in employing students as staff to keep operating costs low. About 95 percent of the 180 staff members are students. As a result, the transit system operates at \$50.00 per hour compared to regional peers that operate near \$85.00 per hour.



Transit Appendix Tables

Peer Transit Comparison								
University	Structure	Routes	Frequency (minutes)	Annual & Daily Trips ¹	Student Fee per Semester	Annual Student Fee Revenue	Annual Operating Budget	Cost Per Hour
Kansas State University	University contracts with ATA for campus service	10 routes; 5 campus-only routes	10 - 60	181,140 ²	\$0.00	No dedicated student fee ⁴	\$240,916 ²	\$24.51 ²
				1,132 daily			\$636,3160 ³	
				257,010 ³				
Auburn University	University contracts with First Transit for campus service	19 routes; 5 campus-only routes	10 - 30	2.8 million 17,500 daily	\$131.00	\$7.0 million	\$7.0 million	Unavailable
Clemson University	University is operator of campus service	4 campus-only routes	10 - 30	Unavailable	\$33.00	\$1.4 million	Unavailable	Unavailable
Colorado State University	University contracts with City of Fort Collins for campus service	24 routes; 5 campus-only routes	10 - 60	900,000 (student trips) 5,625 daily	Unavailable	Unavailable	\$14.2 million	Unavailable
Iowa State University	University contracts with City of Ames for campus service	12 routes; 3 campus-only routes	15 - 60	6.6 million 38,000 daily	\$64.11	\$4.0 million	\$8.9 million	\$74.19
Louisiana State University	University contracts with First Transit for campus service	8 routes; 2 campus-only	10 - 30	Unavailable	\$35.00	\$2.1 million	Unavailable	Unavailable
North Carolina State University	University contracts with First Transit for campus service	11 routes; 8 campus-only routes	7 - 50	3.0 million 18,750 daily	\$81.00	\$5.5 million	\$5 million	Unavailable
Oklahoma State University	University is operator of city-wide and campus service	8 routes; 3 campus-only routes	10 - 20	700,000 4,375 daily	\$27.60 ⁵	\$1.3 million	\$3.6 million	\$72.00
Oregon State University	University is operator of campus service	3 campus-only routes	5 - 15	Unavailable	\$0.00	No dedicated student fee	\$200,000	Unavailable
University of Kansas	University contracts with Lawrence Transit for city-wide and campus service	19 routes; 3 campus-only routes	5 - 30 campus-only routes	2.9 million 18,125 daily	\$89.80	\$3.2 million	\$5.7 million	\$64.00
University of Massachusetts - Amherst	University is contractor for city-wide and campus service	10 routes; 2 campus-only routes	15 - 30	3.0 million 18,750 daily	\$30.00 ⁶	\$1.4 million	\$3.9 million	\$50.00
University of Missouri	University contracts with City of Columbia for campus service	6 campus-only routes	10 - 30	800,000 5,000 daily	\$16.85	\$1.2 million	\$1.2 million	Unavailable
University of Nebraska	University contracts with StarTran for campus service	3 campus-only routes	10 on-call service	750,000 4,645 daily	\$26.66	\$1.3 million	\$2.0 million	Unavailable
Washington State University	University contracts with Pullman Transit for city-wide and campus service	9 routes; 2 campus-only routes	8 campus-only routes	1.5 million 9,375 daily	\$25.00	\$1.7 million	\$2.9 million	\$110.00

¹ Daily trips are estimated trips based on total trips divided by 160 academic days unless specific data provided by university
² Campus-only routes for FY 2014 including annual estimate for Park and Ride route 2014-2015 school year
³ All ATA fixed routes for FY 2014 including annual estimate for Park and Ride route 2014-2015 school year
⁴ Service contract of \$289,750 is provided by Kansas State University in lieu of dedicated student transit fee
⁵ Estimate based on \$2.30 per credit hour for full-time student with twelve credits
⁶ Equivalent revenue is provided through state salaries based on 2005 student population of approximately 22,500

FY 2014 Transit Routes						
	Route	Service Hours	Service Frequency	Annual Trips	Annual Operating Budget	Operating Cost Per Hour
City	Orange	Monday - Friday 7:00 AM - 9:00 PM	60 minutes ¹	49,956	\$357,627	\$31.23
	Green	7:00 AM - 9:00 PM	60 minutes ¹			
	Blue	Saturday 8:00 AM - 7:00 PM	60 minutes ¹			
	Red	8:00 AM - 7:00 PM	60 minutes ¹			
Campus	Jardine Shuttle	Monday - Friday 7:00 AM - 9:00 PM Saturday 7:00 AM - 9:30 AM 11:00 AM - 1:30 PM Sunday 11:00 AM - 1:30 PM	10 minutes	156,976	\$114,417	\$23.38
	Park and Ride ²	Monday - Friday 6:30 AM - 6:30 PM	15 minutes	8,142 ²	\$74,000 ²	\$38.54 ³
	SafeRide (East)	Thursday - Saturday 11:00 PM - 3:00 AM	20 minutes	16,022	\$52,499	\$28.41
	SafeRide (West)		15 minutes			
	SafeRide (Northwest)		60 minutes			
Other	University Crossing	Monday - Friday 7:00 AM - 5:00 PM	30-60 minutes	25,914	\$37,773	\$25.63

¹ Given the overlap on routes, headways are effectively every 30 minutes for some locations
² Information available from the Fall 2014 semester is doubled to estimate annual trips and annual operating budget
³ Estimate based on 12 hours of service Monday through Friday for 160 academic days

Campus Circulator - Option 1 (Perimeter Streets) and Union Express Routes		
Capacity Assumptions		Operating Costs
160	Operating days per year	\$30.88
4	Hours of peak service	\$118,579
11	Hours of non-peak service	\$163,046
500	Expected number of commuters ¹	\$281,626
50%	Percent of commuters using Campus Circulator route	
50%	Percent of commuters using Union Express route	
50%	Percent of commuters during peak period ²	\$75,000
125	Passengers using Campus Circulator route in peak period	\$9,000
125	Passengers using Union Express route in peak period	\$60,000
20	Passengers per cutaway bus	\$40,000
4.7 miles	Campus Circulator - Option 2 route	\$40,000
5-25	Bus speed (mph)	7
32	Minutes per bus route ³	10
1.8	Trips per hour per bus	1
7	Trips per peak hour	2
4	Buses per peak hour	\$525,000
10	Service frequency in peak hour (minutes)	\$230,000
3	Trips per off-peak hour	\$75,000
2	Buses per off-peak hour	\$11,500
20	Service frequency in off-peak hour (minutes)	\$86,500
3.0 miles	Union Express route	
5-25	Bus speed (mph)	
17	Minutes per bus route ³	
3.5	Trips per hour per bus	
6	Trips per peak hour	
2	Buses per peak hour	
10	Service frequency in peak hour (minutes)	
3	Trips per off-peak hour	
1	Buses per off-peak hour	
20	Service frequency in off-peak hour (minutes)	

¹ Based on campus parking projections (see Parking section)
² Based on projections from Student Union garage arrivals and departures
³ Includes 15 percent recovery time at end of route
⁴ Reported to the National Transportation Database by ATA
⁵ Volpe National Transportation Systems Center bus lifecycle cost model
⁶ Assumes small transit shelter
⁷ Order of magnitude estimate of a large transit shelter

Parking Data Collection Table

Campus Circulator - Option 2 (Internal Streets) and Union Express Routes	
Capacity Assumptions	
160	Operating days per year
4	Hours of peak service
11	Hours of non-peak service
500	Expected number of commuters ¹
50%	Percent of commuters using Campus Circulator route
50%	Percent of commuters using Union Express route
50%	Percent of commuters during peak period ²
125	Passengers using Campus Circulator route in peak period
125	Passengers using Union Express route in peak period
20	Passengers per cutaway bus
4.1 miles	Campus Circulator - Option 1 route
5-25	Bus speed (mph)
25	Minutes per bus route ³
2.4	Trips per hour per bus
6	Trips per peak hour
3	Buses per peak hour
10	Service frequency in peak hour (minutes)
3	Trips per off-peak hour
2	Buses per off-peak hour
15	Service frequency in off-peak hour (minutes)
3.0 miles	Union Express route
5-25	Bus speed (mph)
17	Minutes per bus route ³
3.5	Trips per hour per bus
6	Trips per peak hour
2	Buses per peak hour
10	Service frequency in peak hour (minutes)
3	Trips per off-peak hour
1	Buses per off-peak hour
20	Service frequency in off-peak hour (minutes)
Operating Costs	
\$30.88	Cost per hour per vehicle ⁴
\$98,816	Annual peak service cost
\$163,046	Annual off-peak service cost
\$261,862	Total annual operating cost
Capital Costs	
\$75,000	Cutaway bus (7-year life span) ⁵
\$9,000	Transit Shelters (20-year life span) ⁶
\$60,000	Large transit shelter at commuter lot ⁷
\$40,000	Bus turn-out
7	Number of buses (includes spare)
10	Transit shelters
1	Large transit shelter at commuter lot
2	Bus turn-outs
\$450,000	Total bus cost
\$230,000	Total transit stop cost
\$64,286	Pro-rated annual bus cost
\$11,500	Pro-rated annual transit stop cost
\$75,786	Total annual capital cost
Revenue Options	
\$337,648	Annual operating and capital cost
21,000	Student population
\$8.04	"Break-Even" student transit fee per semester

¹ Based on campus parking projections (see Parking section)

² Based on projections from Student Union garage arrivals and departures

³ Includes 15 percent recovery time at end of route

⁴ Reported to the National Transportation Database by ATA

⁵ Volpe National Transportation Systems Center bus lifecycle cost model

⁶ Assumes small transit shelter

⁷ Order of magnitude estimate of a large transit shelter

Kansas State University Parking Data
Tuesday, December 9, 2014 and Wednesday, December 10, 2014

Parking Lot	Permit Type	Description	Capacity	Beginning at 7:00 a.m.		Beginning at 9:00 a.m.		Beginning at 11:00 a.m.		Beginning at 1:00 p.m.		Beginning at 3:00 p.m.		Beginning at 5:00 p.m.		Peak	
				Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%
I1	Z	Grain Science	58	4	7%	23	40%	21	36%	16	28%	24	41%	17	29%	24	41%
I3	Z	Flour Mill	25	1	4%	3	12%	5	20%	7	28%	8	32%	5	20%	8	32%
I2	Z	Feed Mill	30	0	0%	6	20%	17	57%	11	37%	19	63%	13	43%	19	63%
I6	Z	Kansas Wheat Innovation Center	40	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
I5	Z	Grain Science	21	0	0%	6	29%	7	33%	4	19%	10	48%	9	43%	10	48%
S1		East of Football Stadium	1750	24	1%	35	2%	52	3%	59	3%	70	4%	138	8%	138	8%
S2		West of Football Stadium	2700	55	2%	179	7%	181	7%	178	7%	226	8%	177	7%	226	8%
C1	Z	west of Rec fields	270	0	0%	0	0%	0	0%	1	0%	2	1%	42	16%	42	16%
C2	Z	north of rec center	273	56	21%	72	26%	110	40%	90	33%	144	53%	180	66%	180	66%
C3	W	Edwards Hall	127	46	36%	90	71%	93	73%	99	78%	97	76%	59	46%	99	78%
C6	Y	south of Rec center	108	21	19%	29	27%	51	47%	52	48%	89	82%	89	82%	89	82%
C13	J	west edge of Jardine area	193	114	59%	73	38%	62	32%	60	31%	59	31%	71	37%	114	59%
C11	J	On-Street Parking, Hillcrest Drive	103	87	84%	63	61%	48	47%	51	50%	38	37%	43	42%	87	84%
C10	J	west of Jardine "P" Building	28	25	89%	18	64%	17	61%	16	57%	14	50%	20	71%	25	89%
C12	J	north of Jardine "Q" Building	260	133	51%	85	33%	109	42%	114	44%	92	35%	90	35%	133	51%
C9	J	north of Jardine "R" Building	88	48	55%	31	35%	25	28%	24	27%	24	27%	29	33%	48	55%
C8	J	east of Jardine "R" Building	25	20	80%	22	88%	17	68%	19	76%	20	80%	20	80%	22	88%
C7	J	south side of Kerr Drive	111	103	93%	89	80%	91	82%	88	79%	85	77%	86	77%	103	93%
C14	J	Jardine Drive, south of "L" Bldg.	24	10	42%	5	21%	5	21%	6	25%	6	25%	6	25%	10	42%
C18	J	Jardine Community Center	94	70	74%	69	73%	53	56%	53	56%	57	61%	60	64%	70	74%
C16	J	On-Street Parking, Jardine Drive	34	25	74%	25	74%	21	62%	21	62%	21	62%	17	50%	25	74%
C15	J	south of Jardine Dr, near "N" bldg.	117	89	76%	89	76%	75	64%	76	65%	74	63%	67	57%	89	76%
C17	J	Jardine Drive, south of "E" bldg	65	62	95%	63	97%	62	95%	61	94%	59	91%	62	95%	63	97%
C4	J	On-Street Parking, Kerr Drive	77	65	84%	58	75%	64	83%	63	82%	67	87%	71	92%	71	92%
C5	J	On-Street Parking, Roof Drive	107	99	93%	84	79%	80	75%	76	71%	73	68%	55	51%	99	93%
B19	Y	West of Pat Roberts Hall	41	3	7%	13	32%	15	37%	15	37%	18	44%	3	7%	18	44%
B6	Y	West of Moser Hall	261	98	38%	235	90%	223	85%	236	90%	225	86%	103	39%	236	90%
B5	T	North of Jardine Drive	379	87	23%	373	98%	346	91%	256	68%	268	71%	122	32%	373	98%
B21	Y	Child Development Center	50	7	14%	23	46%	22	44%	19	38%	21	42%	36	72%	36	72%
B18	Z	North of Jardine Drive	206	20	10%	42	20%	76	37%	55	27%	43	21%	24	12%	76	37%
B17	Z	North of Weber Hall	503	352	70%	374	74%	408	81%	410	82%	360	72%	278	55%	410	82%
B3	R	South of Jardine Dr	530	527	99%	529	100%	527	99%	529	100%	515	97%	496	94%	529	100%
F10	Y	Hoefflin Stone House	40	7	18%	24	60%	23	58%	28	70%	27	68%	15	38%	28	70%
B2	R	North of Claflin Ave	537	536	100%	533	99%	532	99%	531	99%	534	99%	531	99%	536	100%
B16	T	North of Weber Hall	271	3	1%	110	41%	215	79%	211	78%	204	75%	69	25%	215	79%
B1	T	East of Weber Hall	120	27	23%	114	95%	110	92%	105	88%	110	92%	92	77%	114	95%
B7	Y	Davenport Hall	39	32	82%	32	82%	28	72%	31	79%	32	82%	2	5%	32	82%
B10	Y	East of Pittman Hall	43	5	12%	29	67%	30	70%	19	44%	32	74%	25	58%	32	74%
B11	T	East of Dole Hall	88	5	6%	74	84%	80	91%	71	81%	74	84%	26	30%	80	91%
B4	T	North of Call Hall	110	8	7%	98	89%	110	100%	95	86%	95	86%	46	42%	110	100%
B13	W	North of Umberger Hall	206	4	2%	202	98%	199	97%	180	87%	191	93%	58	28%	202	98%
B13	T	North of Umberger Hall	30	13	43%	30	100%	28	93%	27	90%	30	100%	15	50%	30	100%
B15	Y	North of Throckmorton Hall	18	9	50%	16	89%	16	89%	14	78%	17	94%	15	83%	17	94%

Parking Lot	Permit Type	Description	Capacity	Beginning at 7:00 a.m.		Beginning at 9:00 a.m.		Beginning at 11:00 a.m.		Beginning at 1:00 p.m.		Beginning at 3:00 p.m.		Beginning at 5:00 p.m.		Peak	
				Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%	Occ.	%
B14	Y	Dykstra Hall	36	24	67%	23	64%	28	78%	20	56%	22	61%	26	72%	28	78%
B8	T	KSU Gardens	51	19	37%	32	63%	31	61%	32	63%	22	43%	8	16%	32	63%
B9	K	behind KSU Gardens	53	36	68%	38	72%	33	62%	35	66%	35	66%	39	74%	39	74%
B12	W	West of Call Hall	40	4	10%	29	73%	30	75%	30	75%	28	70%	10	25%	30	75%
F7		Behind Call Hall	5	3	60%	3	60%	4	80%	5	100%	5	100%	2	40%	5	100%
A16	T	On-Street Parking, Clafin Road	26	1	4%	25	96%	25	96%	23	88%	24	92%	17	65%	25	96%
A14	D	Between Haymaker and Moore	89	69	78%	72	81%	72	81%	74	83%	72	81%	69	78%	74	83%
A15	D	NW of Moore Hall	47	39	83%	42	89%	37	79%	40	85%	38	81%	35	74%	42	89%
A12	D	Between West and Ford Hall	121	92	76%	103	85%	109	90%	104	86%	96	79%	95	79%	109	90%
A11	D	SW of West Hall	88	75	85%	78	89%	79	90%	75	85%	73	83%	63	72%	79	90%
A13	Y	Between Ford and Haymaker	58	30	52%	40	69%	44	76%	55	95%	47	81%	25	43%	55	95%
A23	Y	On-Street, Leadship Studios	4	0	0%	3	75%	3	75%	3	75%	3	75%	3	75%	3	75%
F6		north of Boyd Hall	17	7	41%	6	35%	11	65%	6	35%	6	35%	5	29%	11	65%
A10	Y	North of Van Zile Hall	25	11	44%	14	56%	17	68%	18	72%	17	68%	14	56%	18	72%
A9	Y	Between Putnam and Van Zile Hall	7	3	43%	5	71%	4	57%	5	71%	5	71%	3	43%	5	71%
F5	O	On-Street, Petticoat Lane	17	2	12%	15	88%	14	82%	13	76%	12	71%	12	71%	15	88%
F4	W	On-Street, Campus Creek Drive	23	1	4%	18	78%	21	91%	20	87%	20	87%	17	74%	21	91%
F3	Y	NE corner of Justin Hall	11	7	64%	10	91%	11	100%	7	64%	9	82%	3	27%	11	100%
A8	W	East of King Hall	18	2	11%	13	72%	17	94%	9	50%	13	72%	11	61%	17	94%
A6	W	North of Dickens Hall	72	43	60%	68	94%	69	96%	63	88%	62	86%	56	78%	69	96%
A5	O	North of Justin Hall	34	4	12%	33	97%	34	100%	33	97%	34	100%	32	94%	34	100%
A5	W	North of Justin Hall	165	11	7%	143	87%	148	90%	141	85%	145	88%	110	67%	148	90%
F1		Front of Justin Hall	6	0	0%	5	83%	4	67%	2	33%	3	50%	3	50%	5	83%
A3	W	North of Vattier Street	36	22	61%	44	122%	46	128%	46	128%	43	119%	24	67%	46	128%
A2	T	South of Vattier Street	235	12	5%	214	91%	222	94%	220	94%	213	91%	140	60%	222	94%
A1	T	East of Beach Art Museum	83	9	11%	78	94%	81	98%	80	96%	70	84%	52	63%	81	98%
A1A	Y	South of Beach Art Museum	35	2	6%	14	40%	18	51%	16	46%	17	49%	16	46%	18	51%
A31	Y	south of Thompson Hall	9	3	33%	4	44%	4	44%	4	44%	2	22%	3	33%	4	44%
E13	Y	College Court	40	6	15%	33	83%	29	73%	25	63%	27	68%	7	18%	33	83%
E3	W	Drive to Nichols Hall	5	0	0%	0	0%	2	40%	1	20%	3	60%	0	0%	3	60%
E16	Y	Alumni Center West	40	3	8%	23	58%	22	55%	20	50%	28	70%	26	65%	28	70%
E1	Y	Alumni Center East	19	2	11%	13	68%	11	58%	11	58%	15	79%	10	53%	15	79%
E5		Mid-Campus Drive at Kedzie Hal	4	2	50%	3	75%	4	100%	3	75%	3	75%	1	25%	4	100%
E8		Front of Anderson Hall	13	1	8%	12	92%	11	85%	10	77%	8	62%	6	46%	12	92%
E7		Meters along Vattier Street	8	2	25%	3	38%	6	75%	7	88%	8	100%	4	50%	8	100%
E10		McCain circle drive	21	2	10%	3	14%	9	43%	10	48%	6	29%	13	62%	13	62%
E12		Danforth Chapel	5	0	0%	0	0%	3	60%	1	20%	1	20%	0	0%	3	60%
E6	Y	Behind Anderson Hall	15	0	0%	5	33%	4	27%	2	13%	8	53%	2	13%	8	53%
E9		Front of Eisenhower Hall	12	0	0%	11	92%	10	83%	8	67%	10	83%	12	100%	12	100%
A24	Y	English Counseling Service	13	5	38%	7	54%	8	62%	7	54%	7	54%	7	54%	8	62%
A25	Y	Seaton Hall Courtyard	39	14	36%	12	31%	18	46%	18	46%	18	46%	18	46%	18	46%
A26	W	College Heights Rd	52	20	38%	27	52%	28	54%	26	50%	25	48%	16	31%	28	54%
A20	K	Just north of Waters Hall	31	17	55%	21	68%	25	81%	22	71%	23	74%	19	61%	25	81%
A22	W	Just north of Shellenberger hall	40	15	38%	26	65%	29	73%	29	73%	30	75%	19	48%	30	75%
A17	O	North of Waters Hall	123	3	2%	123	100%	123	100%	113	92%	123	100%	60	49%	123	100%
A17	W	North of Waters Hall	180	8	4%	175	97%	176	98%	172	96%	174	97%	110	61%	176	98%
A17	T	North of Waters Hall	68	1	1%	67	99%	66	97%	67	99%	67	99%	53	78%	67	99%
A18	W	North of Bushnell Hall	119	19	16%	114	96%	116	97%	115	97%	114	96%	79	66%	116	97%
A19	Y	West of Bushnell Hall	20	10	50%	12	60%	17	85%	16	80%	17	85%	14	70%	17	85%
A21	Y	Between Waters & Shellenberger	9	2	22%	5	56%	6	67%	4	44%	5	56%	5	56%	6	67%
A4	Y	North of Holton Hall	7	0	0%	5	71%	6	86%	6	86%	5	71%	4	57%	6	86%
D6	Y	Lafene Health Center	105	5	5%	65	62%	77	73%	32	30%	82	78%	48	46%	82	78%
D4	GM	NE of Marlatt Hall	119	104	87%	104	87%	107	90%	108	91%	102	86%	106	89%	108	91%
D5	GM	South of Marlatt Hall	199	162	81%	173	87%	181	91%	183	92%	179	90%	158	79%	183	92%
D3	Y	Front of Goodnow Hall	22	13	59%	13	59%	16	73%	14	64%	18	82%	8	36%	18	82%
A28	W	Durland Hall	213	73	34%	208	98%	206	97%	204	96%	195	92%	108	51%	208	98%
A28	O	Durland Hall	190	55	29%	185	97%	188	99%	185	97%	183	96%	115	61%	188	99%
D1	O	Old stadium lot	255	22	9%	215	84%	249	98%	235	92%	214	84%	150	59%	249	98%
D1	Z	Old stadium lot	311	311	100%	311	100%	311	100%	310	100%	309	99%	303	97%	311	100%
D1	T	Old stadium lot	275	6	2%	96	35%	263	96%	239	87%	195	71%	110	40%	263	96%
D1	W	Old stadium lot	63	6	10%	28	44%	60	95%	59	94%	53	84%	43	68%	60	95%
D1	R	Old stadium lot	60	60	100%	60	100%	60	100%	60	100%	60	100%	67	112%	67	112%
F5	W	On-Street, Petticoat Lane	11	1	9%	10	91%	9	82%	10	91%	10	91%	7	64%	10	91%
H8	Y	Rowing Center	13	4	31%	5	38%	5	38%	6	46%	2	15%	1	8%	6	46%
H8		17th Street	2	0	0%	1	50%	2	100%	2	100%	0	0%	0	0%	2	100%
H8		17th Street	4	1	25%	2	50%	1	25%	3	75%	2	50%	3	75%	3	75%
	Garage	Union Parking Garage	1367	25	2%	730	53%	864	63%	845	62%	771	56%	505	37%	864	63%
		Subtotal	15703	4411	28%	8146	52%	8798	56%	8444	54%	8410	54%	6492	41%	9495	60%
		TOTAL (stadium lots not included)	11253	4332	38%	7932	70%	8565	76%	8207	73%	8114	72%	6177	55%	9131	81%

Parking Removed for Implementation of K-State Master Plan					
Lot ID		Location	# Spaces Removed	Peak Demand	%
B1	T	East of Weber Hall	120	114	95%
B2	R	North of Clafin Rd	537	536	100%
B3	R	South of Jardine Dr	256	256	100%
B4	T	North of Call Hall	110	110	100%
B5	T	East of Mosier Hall	379	377	99%
B11	T	Dole Hall Lot	88	80	91%
B12	W	West of Call Hall	40	30	75%
B16	T	North of Weber Hall	271	215	79%
B17	Z	North of Weber Hall	768	675	88%
B18	Z	North of Jardine Dr	206	76	37%
C3	W	Edwards Hall Lot	127	99	78%
D5	GM	South of Marlatt	199	183	92%
A11	D	West Hall Lot	88	79	90%
A28	W	Durland Hall Lot	213	208	98%
	O		190	188	99%
B13	T	North of Umberger Hall	30	30	100%
	W		206	202	98%
A17	T	SW Corner of Clafin Rd and Mid Campus Dr	68	67	99%
	O		123	123	100%
	W		180	176	98%
A18	W	North of Bushnell Hall	119	116	97%
A22	W	North of Waters hall	40	30	75%
A21	K	North of Waters hall	31	25	81%
A5	O	North of Justin Hall	34	34	100%
A5	W	North of Justin Hall	165	148	90%
A6	W	North of Dickens Hall	72	69	96%
A2	T	South of Vattier St	235	222	94%
		TOTAL	4895	4468	91%



ACKNOWLEDGEMENTS

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 College of Agriculture
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 Faculty Senate
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 K-State Sustainability

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