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EXECUTIVE SUMMARY

Compact, sustainable, and good for your health, bicycles provide benefits that greatly exceed the cost of the infrastructure they require. As space becomes limited and traffic increases on and around campus, bicycles may become a more frequently chosen mode of transportation for many people commuting to and traveling on campus.

The KU Campus Master Plan and Campus Sustainability Plan have acknowledged that providing a comfortable and convenient bicycling environment is desirable and essential for the future of transportation at KU. Bicycling is no longer a purely recreational activity chosen only by the dedicated, competitive cyclist.

Bicycling is for the student who wants to live on campus without the hassle and expense of car ownership. It is for the student living off campus who slowly circles the parking lot, hunting for a spot while a fellow student glides into the bike parking racks near the front door of Budig Hall. It is for the employee who lives close to campus and uses his or her commute to get their daily exercise. It is for the family that wants to see the big game on a beautiful fall day, but does not want to be stuck in traffic.

Those who are not able, or choose not to bike also reap benefits. More bicyclists means less noise, less traffic, and less parking congestion on nearby neighborhood streets. It means less pollution and lower demand for surface parking lots.

With these benefits in mind, the KU Bike Plan addresses the following goals:

- **Enhance the bikeway network linking residential, academic, and recreational destinations on campus and in the community**
- **Promote a safe, healthy campus environment**
- **Increase the percentage of bicycle and pedestrian users on campus through the implementation of new policies, programs, and infrastructure**
- **Improve coordination with the City of Lawrence and create seamless transitions between university and city bike infrastructure and routes**
- **Create movement uphill by identifying policy, program, and infrastructure solutions that encourage people to overcome the real and perceived barrier of steep routes to campus**

This plan assesses the strengths and challenges of current bicycling conditions on and around campus and evaluates potential tools that KU could use to achieve its goals for improving bicycling conditions at KU. With a toolbox of policy, program, and infrastructure ideas, feasible steps the university could take to improve the bicycling environment at KU are identified.

The plan details potential sources of funding for listed recommendations, including alumni donations, student fees, state alternative transportation grants, and corporate sponsorships.

Implementation of these recommendations will allow any student, faculty, staff, or campus visitor to comfortably make it to the top of Mount Oread through thoughtful route finding. It will provide education that helps both novice and experienced cyclists to feel comfortable and confident navigating the route to their classroom or workplace. It will help provide realistic travel options for those who cannot afford or choose not to have a car. Even the administrator will be able to bike while still maintaining his or her professional attire.

Real change can be achieved for cyclists at KU with collective vision, creativity, and diverse funding. This plan provides the framework and flexibility for leaders at the university to make pragmatic progress, starting today. It sets the stage for a new opportunity to rise far above and make KU a premier university for bicycling.
PRIORITY RECOMMENDATIONS

Short-term
- Identify funding for and hire a Campus Bicycle Coordinator
- Establish review process for all construction projects to incorporate KU BAC feedback on bike infrastructure
- Adopt short-term and long-term bicycle parking guidelines proposed by KU BAC into Design and Construction Management standards
- Identify locations for bicycle signage including ‘3-foot passing law’ and ‘Bicycle may use full lane’ signs
- Consolidate bike related resources to a single website at bike.ku.edu
- Pursue Bicycle Friendly University designation

Long-term
- Add bicycle infrastructure during construction or reconstruction of streets, buildings, and parking lots on campus
- Develop a connection to the existing shared use path north of Clinton Parkway and Atchison Avenue
- Add climbing lanes and signage to routes identified in the Campus Master Plan and Countywide Bikeway System Plan.
- Develop standards for end-of-trip facilities in campus buildings.
INTRODUCTION

The University of Kansas has placed an emphasis on sustainable transportation practices that will lead to an active and connected campus. Recent plans and projects have made great strides towards improving the campus experience for all members of the KU community, including bicyclists.

The 2011 University of Kansas Sustainability Plan provides a basic framework for improvements to multi-modal transportation. The 2014-2024 Campus Master Plan builds on that approach, calling for major improvements to bicycling and other infrastructure on campus. Each of these plans is supported by recommendations in the Lawrence-Douglas County Countywide Bikeway System Plan.

This plan aims to refine that work and shape campus planning and implementation around the following goals:

- Enhance the bicycle network linking residential, academic, and recreational destinations on campus and in the community
- Promote a safe, healthy campus environment
- Increase the percentage of bicycle and pedestrian users on campus through the implementation of new policies, programs, and infrastructure
- Improve coordination with the City of Lawrence and create seamless transitions between university and City bike infrastructure and routes
- Create movement uphill by identifying policy, program, and infrastructure solutions that encourage people to overcome the real and perceived barrier of steep routes to campus

The KU Bike Plan outlines short- and long-term recommendations that address these five central goals while incorporating the “Five E’s” that are important elements in creating great places to bike: education, encouragement, enforcement, engineering and evaluation. These recommendations serve as a blueprint for making progress toward a more bicycle friendly campus environment over the next ten years.

PLANNING PROCESS

The planning process was framed by the above goals and based on previous efforts by the KU Bicycle Advisory Committee (KU BAC), a group that was formed in 2012 to promote bicycling to and on campus, educate the campus community on bicycle safety and etiquette, and advise Campus Operations on matters related to bicycle infrastructure. The process was coordinated by the Spring 2016 Urban Planning Transportation Implementation course, with input from the KU BAC, and included the following phases: Best Practices Review, Existing Conditions Analysis, Public Engagement, and Recommendations.

Best Practices Review

A focused peer review identified important considerations for the KU Bike Plan. Bike plans from fifteen cities and universities were reviewed to identify commonalities, best practices, and original ideas, as well as discover opportunities that might address challenges similar to those on our own campuses. The University of Colorado at Boulder, the University of Wisconsin at Madison, and the University of California at Davis were identified as key aspirational peers, and their plans were evaluated in greater detail to gain more specific insights.

Additional resources were explored to learn about tools used to increase bicycling in areas with steep terrain.

Existing Conditions Analysis

The existing conditions analysis considered data pertaining to demographics, land use and zoning, the campus environment and the surrounding areas, bicycle parking facilities, traffic and bicycle counts, the existing and planned bikeway network, and current plans and policies. Crash data provided by the Kansas Department of Transportation (KDOT) was analyzed along with the existing and proposed bicycle routes in order to fully assess the state of the bicycle and roadway network on campus and in the surrounding neighborhoods.

1 http://www.bikeleague.org/content/5-es
Public Engagement
Outreach to administration, current bicyclists and the KU campus community at large was included in the process. Design & Construction Management (DCM) staff, Public Safety Office (PSO) officers, and Student Senate representatives were interviewed and contributed to the planning process. Flyers directing riders to an online survey were attached to bicycles in order to target the current bicycling population on campus. Whiteboards were also set up on Wescoe Beach to record input from the public on general bicycle topics related to campus, in order to better understand the perceived barriers to cycling and gain knowledge on what might motivate more people to ride their bicycle.

Recommendations
Ideas gained from the peer review, information from the existing conditions analysis, materials gathered relating to facility types, and the results of public engagement were synthesized and used to create recommendations for existing and future bikeways. The input was also used to formulate recommendations that include education, encouragement, enforcement, and evaluation.

This document should guide discussion on campus about sustainable transportation infrastructure that can be implemented in the years and decades to come. The KU Bike Plan is not a culmination of the planning process, but is instead another step toward a safer and more comfortable environment for bicyclists on campus.
CURRENT PLANS AND POLICY CONTEXT

KU MASTER PLAN

Developed in 2013, KU’s 2014-2024 Campus Master Plan1 lays out future growth for the Lawrence and Edwards Campuses. The plan was put together by KU’s Design & Construction Management and Capital Planning & Space Management departments with guidance from executive and steering committees.

The Campus Master Plan focused on goals and principles gathered through Bold Aspirations, the strategic plan that informed development of the physical master plan. Some key goals that are applicable to the bicycle plan include:

• Develop strategies that integrate the Main Campus and West Campus to realize a unified university.
• Create an inclusive university by designing safe and accessible campuses, embracing accessibility.
• Reinforce the pedestrian experience, while fully developing a multimodal transportation system, providing access to the campus and community.

2012 PARKING AND TRANSIT COMMUTER SURVEY

The Campus Master Plan references a 2012 KU Parking & Transit commuter survey that found a driving to campus is the most common mode of transportation for students. However, a larger percentage of students typically walk or take the bus. The survey also found that few students or employees biked to campus, being discouraged by the terrain, a lack of bicycle accommodations, and weather.

PROMOTING BICYCLING ON CAMPUS

Current trends in congestion and lack of parking indicate that the automobile might not remain the preferred mode of transportation on campus in the coming years. Due to this, bicycling was incorporated into the master plan. A major concept of the master plan is to connect Main Campus and West Campus into one Lawrence Campus with three separate districts. A new pedestrian and bicycle path will unite the districts, dubbed the Jayhawk Trail.

The master plan also found that there are three primary components to increased bicycle use:

• Establishing a network of on- and off-road facilities
• Creating sufficient supporting infrastructure, such as covered bicycle parking and showers
• Developing support programs to raise awareness of options and identify strategies to encourage safe travel.

The plan points out that all of these are very cost effective when compared to new parking structures or more transit service. The plan goes into more detail about existing and proposed bike routes, infrastructure, and programs, which will be incorporated into this plan.

1 https://dcm.ku.edu/2014-2024-university-kansas-campus-master-plan
KU SUSTAINABILITY PLAN

Developed in 2011, KU’s Campus Sustainability Plan provides a framework for growth based on the tenets of sustainability. The plan was coordinated by the Center for Sustainability, with participation from students, faculty, staff, and an external review team. The sustainability plan focuses on embracing sustainability by functioning more efficiently and effectively. One key goal set by the plan is to “create an environment that supports the multi-modal transportation system.”

A component of this goal is to “increase the percentage of students, faculty, and staff that walk or bike to campus.” Strategies to achieve this goal include the following:

- Become a League of American Bicyclists’ “Bike Friendly University”
- Enhance pedestrian and bicycle connections to the university by improving infrastructure such as walkways, bike paths, and lighting
- Provide biking infrastructure – showers, bike lockers, bike racks, indoor bike storage
- Develop a reliable bike share program
- Identify bike facilities and bike routes with maps and signage on campus
- Promote bicycling and walking to campus through commuter education and incentive programs such as time it takes to bike or walk to certain parts of campus, health benefits, etc.

ACTION STEPS

The Sustainability Plan developed action steps for achieving their transportation strategies. Some key steps that are applicable to the bicycle plan include:

- Develop a limited use parking permit option to allow parking for commuters who walk, bike, or bus to campus as their primary mode of transportation
- Develop standards for new construction and redevelopment to incorporate enclosed or covered bike storage, shower facilities, and bike route identification

LAWRENCE-DOUGLAS COUNTY COUNTYWIDE BIKEWAY SYSTEM PLAN

Developed in 2013 in coordination with the KU Campus Master Plan, the Lawrence Countywide Bikeway System Plan identifies and prioritizes countywide bike transportation needs for the next five to ten years. The plan was developed by the Lawrence-Douglas County Metropolitan Planning Organization (MPO), URS, Toole Design Group, and Vireo.

Some key objectives for the plan include:

- Connectivity
- Consistent Design Standards
- Plan and Construct Amenities
- Enforcement and Safety
- Continues Participation
- Education
- Encouragement
- Evaluation

The public participation process for the KU Bike Plan did not result in the identification of road segments or intersections that are difficult to navigate on a bicycle. In lieu of this, the Countywide Bikeway System Plan is referenced here with challenging locations and intersections that bicyclists throughout Douglas County identified in 2013 shown in Figure 1. While not tailored for the development of this document, this information provides some insight on road segments and intersections that are perceived as unsafe.

1 https://sustain.ku.edu/plan
2 http://lawrenceks.org/assets/mpo/study/reports/bike.pdf
LAWRENCE-DOUGLAS COUNTY COUNTYWIDE BIKEWAY SYSTEM PLAN RECOMMENDATIONS

The plan made several policy, program, and engineering recommendations for Lawrence and Douglas County. These recommendations include but are not limited to:

1. Inclusion of bike lanes with future and reconstructed streets
2. Use of sharrows to connect identified bike routes and bike lanes
3. Encouragement of National Bike Month activities
4. Organized group rides
5. Engagement with area organizations such as the Lawrence Home Builders Association and Chamber of Commerce
6. Continued dissemination of bike maps
7. Continued offerings of Helmet Fairs and Bike Rodeos
8. Increased enforcement of traffic laws along popular bike routes

Figure 1: Difficult Locations Identified by Bicyclists

Source: Lawrence-Douglas County MPO Countywide Bikeway System Plan
EXISTING AND PLANNED BIKEWAYS NETWORK

Designation of future bikeways was coordinated between the Campus Master Plan and Lawrence-Douglas County Countywide Bikeway System Plan processes. Figure 2 shows the existing and future bikeway network on campus and in the surrounding neighborhoods. Complete existing and planned routes for Lawrence and Douglas County can be found here: http://lawrenceks.org/assets/mpo/study/reports/bike.pdf

Figure 2: Existing and Planned Bikeway Network at the University of Kansas

Source: 2013 Douglas County Countywide Bikeway System Plan
The City of Lawrence, Kansas is the sixth most populated city in the state. Located on the Kansas River between Kansas City and Topeka, it has a population of approximately 90,000\(^1\). The University of Kansas boasts an enrollment of 25,000 on its Lawrence campus. With students comprising such a large percentage of the population, there are a few interesting statistics to keep in mind:

- 22% of the population is between the ages of 20-24.
- 54.4% of housing units are rented.
- The University of Kansas is the largest employer in Lawrence.

Table 1 shows a breakdown of age groups in Lawrence, Kansas. The large percentage of young adults in the community creates both challenges and opportunities prevalent in many other college towns. The large number of college students can also partially explain the high poverty rate since many students are not able to work full time while attending school.

\(^1\)U.S. Census Bureau’s American Community Survey (ACS) 5 Year Estimates (2014) Table
Figure 3 shows the geographic location of people between 18 and 24 years old. These are also the people statistically most likely to bike to campus.

Figure 4 shows the distribution of the population that walks or bikes to work. This population is within approximately 0.6 miles of campus. It should also be noted that the area directly to the east of campus contains the largest concentrations of individuals who walk or bike to work. These neighborhoods contain a mix of students and long-term residents and also includes Downtown.

**Figure 3: Geographic Location of Population 18 to 24 Years**

**Figure 4: Distribution of Commuting Pattern Among the Population**

<table>
<thead>
<tr>
<th>Percent of Population Ages 18 to 24 Years Old</th>
<th>Commuting Population that Walks or Bikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% to 25%</td>
<td>5% to 10%</td>
</tr>
<tr>
<td>26% to 50%</td>
<td>11% to 15%</td>
</tr>
<tr>
<td>51% to 75%</td>
<td>16% to 20%</td>
</tr>
<tr>
<td>76% to 90%</td>
<td>21% to 40%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2010-2014 ACS 5-Year Estimates
Population projections can be used to identify future areas of growth in the city. Table 2 shows low, medium, and high population estimates for the City of Lawrence in 2020, 2030, and 2040. Figure 5 shows where that population growth is expected to occur by 2040.

As the City expands in size and population, KU may need to consider how future students, faculty, and staff will be able to access campus by bicycle.

Table 2: Population Projections for Lawrence, Kansas

<table>
<thead>
<tr>
<th>Projections</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (Average Growth Rate 2005 - .5%)</td>
<td>97,469</td>
<td>102,454</td>
<td>107,693</td>
</tr>
<tr>
<td>Medium (Linear Regression 2000-2009)</td>
<td>106,667</td>
<td>119,529</td>
<td>132,391</td>
</tr>
<tr>
<td>High (Average Growth Rate 2000-2005 – 1.9%)</td>
<td>111,930</td>
<td>135,111</td>
<td>163,092</td>
</tr>
</tbody>
</table>

Source: Transportation 2040, Lawrence-Douglas County Metropolitan Transportation Plan, Appendix B, page 8

Figure 5: Population Projection for Lawrence, Kansas

Source: Transportation 2040, Lawrence-Douglas County Metropolitan Transportation Plan, Appendix B, page 12
Figure 6 shows current land use for all university property owned by KU and KU Endowment. This plan focuses its recommendations on campus, but also considers how connections can be made to areas surrounding campus since most bicycle trips may originate or terminate off campus.

Figure 6: Existing Land Use on Campus

Source: KU 2014 - 2014 Campus Master Plan
CAMPUS

The KU campus is comprised of three connected but distinct areas shown in Figure 7. The east side is referred to as the North District. This section of campus is the oldest, densest, and is what most people think of when they visualize the KU campus. It is centered around Jayhawk Boulevard and features a large number of academic and administration buildings, athletic facilities, and other various cultural and residential facilities. As a main core of undergraduate education, particularly within the College of Liberal Arts and Sciences, it is likely to be the primary destination for cyclists in the KU community.

Buildings in the North District are older and closer together. There is limited parking in the North District, and a dense network of roads and sidewalks. Aside from primary organization around Jayhawk Boulevard, the defining feature of the North District is Mt. Oread, or “the hill,” that the core part of campus rests atop. This hill has guided land use on campus for more than a century and is also one of the greatest impediments for any bicyclist attempting to reach the core of the North District.

The Central District sits to the southwest of the North District and to the east of the West District. The Central District is undergoing development and includes athletic facilities as well as Innovation Way, along which engineering and other future STEM related educational facilities are being located. Its proximity to the North District and the historic core of campus makes the Central District another key node and destination for bicycling activity on campus.

The West District is the least developed but features an increasing number of campus facilities. This district is separated from the Central District by the heavily trafficked Iowa Street. Any campus planning, particularly multi-modal transportation planning must consider the current and future uses of the West District.
Figure 7: Campus Districts
AREAS SURROUNDING CAMPUS

While the Lawrence Campus is the focus of this study, many bicycle trips are made in and out of the surrounding neighborhoods. Understanding the land uses around the campus is key to beginning to form a more useful and beneficial plan for bicyclists in at KU.

Massachusetts Street and the vibrant core of downtown Lawrence is one half mile to the northeast of campus. Downtown is a place of residence for some students, as well as a place of employment and entertainment. While there is a well-developed street grid that connects downtown to campus, the topography is arguably the most challenging in Lawrence. Most streets feature a steep grade up the hill to the historic core of campus. Between downtown and campus is an area characterized by a mix of single-family homes with historic architecture, and moderately dense apartments, duplexes and townhouses. In both downtown Lawrence and areas directly abutting campus itself, denser residential units are being constructed, sometimes as tall as six or seven stories. Increased density combined with the proximity to campus could lead to increased bicycling on campus. However, due to the topographical challenges mentioned above, additional infrastructure and education may be necessary.

South of campus is 19th Street and 23rd Street. 19th Street has seen growing traffic, and 23rd Street is one of Lawrence’s primary commercial corridors, largely defined by commercial strip development and big box stores. The area in between is mainly residential and includes rental properties where many students reside. The approach to campus from this area is relatively flat, which presents an opportunity to increase bicycle transit from these neighborhoods.

To the west of campus, the land use pattern differs greatly from that of the more dense and historic areas to the north and east or more recently developed areas to the south. Land use patterns to the west are largely residential and suburban. While there are some apartment complexes to the west of campus, the primary land use is single family residential.

North of campus are single-family residential areas. These areas are older than the neighborhoods to the west or south of the university, but not as old as the east neighborhoods. While home to some students (particularly in fraternity and sorority houses), this section is also the home of many faculty.

Centrally located in Lawrence, KU is truly at the heart of the city. Based on land use patterns in Lawrence, there is the potential for cyclists to be entering and exiting campus in all directions for destinations throughout the community. The centrality of campus increases the importance of a well-planned and implemented bicycle plan for the University of Kansas.
PUBLIC ENGAGEMENT

The development of this plan included a diverse set of public engagement methods to gather feedback from different groups of stakeholders. The public participation process included tabling in front of Wescoe Hall, administering an online survey, and conducting interviews with key staff, administration, and students who are in a position to guide decision-making on campus regarding bicycling issues.

WESCOE HALL STUDENT ENGAGEMENT

The open plaza on the north side of Wescoe Hall, nicknamed Wescoe Beach, is often a forum for informational tables, political discussions, food vending, and other social activities that bring people together. Feedback was solicited from students at this location during a busy 3-hour time period on a weekday in March of 2016. Students were asked two key questions:

1. What keeps you from biking on campus?
2. What would motivate you to bike on campus?

Responses to these prompts helped identify the largest barriers and opportunities KU has in improving the bicycling environment on campus.

Barriers to bicycling on campus that were identified most often included not having a personal bicycle to use, using alternatives like the bus, living outside of Lawrence, needing to maintain a professional appearance, steep hills, and stolen bicycles.

The top identified items for motivation were better routes, a bike share program, and better campus security.

Complete information from the Wescoe Hall engagement can be found in Appendix B.

SURVEY

To reach more students, flyers were handed out and attached to parked bicycles that directed people to an online survey. Questions in the survey aimed to understand more about people’s current bicycling behavior, what would improve their comfort with bicycling on campus, and their willingness to fund bicycling improvements through student fees.

The number of survey respondents was limited and the majority bicycle to campus daily. Most respondents indicated that covered bicycle parking would make their experience better and that they would be willing to raise student fees to fund bicycling improvements.
STAKEHOLDER INTERVIEWS

One-on-one meetings were conducted with staff members from Design and Construction Management (DCM) and the Public Safety Office (PSO) to better understand their roles in influencing the bicycling environment at KU. Members of Student Senate were also interviewed to understand their views and roles in improving the bicycling environment. Key details from those interviews are included here.

DESIGN & CONSTRUCTION MANAGEMENT

- DCM ensures that new buildings constructed on campus include bicycle parking that is convenient but not obtrusive.
- Standard university bicycle parking is installed during building construction.
- DCM references the bicycle parking guidelines created by the KU Bicycle Advisory Committee when setting the required amount of bicycle parking for projects.
- The Central District development is the first project that will include the KU BAC guidelines for bicycle parking.
- The Central District will have a large impact on biking with the introduction of the Jayhawk Trail connecting the West and North Districts.
- The new standard was available when Capitol Federal Hall, the School of Business building, was being completed and were used to leverage additional parking spaces with that project.

- New bicycle projects on campus are managed by the DCM. Projects under $100,000 are planned in house.
- Aesthetics of bicycle parking are considered as part of the construction project, and it is often screened or placed away from the front of buildings to keep it hidden from view.
- DCM would like to know where bicyclers want to park and where rails and other infrastructure would be needed.
- Showers, lockers and covered parking have not been thoroughly considered yet.

PUBLIC SAFETY OFFICE

- Public Safety (PS) encourages helmet use although it is not required on campus.
- PS enforces regulations when there is time and money to do so.
- PS would like riders to be aware of their surroundings and for bicyclers to travel in groups like pedestrians should.
- PS could see themselves being more involved with programs and education in the future.
- Community services within the department conduct bicycle safety training during Hawk Week.
- PS deals with broken locks, stolen bicycles (30-40 a year), and bicycles that are parked in the wrong locations.

STUDENT SENATE

Many Student Senators are passionate about biking and other sustainable initiatives. However, they have noticed that many sustainable and bicycle-related initiatives have started to be pushed aside by other pressing concerns being voiced by the student population.

Student fees are allocated by Student Senate for many different activities, projects and services around campus. In fact, some of this money goes to the “Campus Environmental Improvement Fee” which focuses on creating a more sustainable campus. This fee could serve as a future source of funding for bike plans if students show support for the initiative.

While Student Senate is aware of the KU master plan, they view it as a document that is in the realm of KU’s administrative leaders. It is the Senate’s job to listen to the voices of the students and attempt to focus on the students rather than the administration.

Among parties running in the 2016 student election, one was a party called “OneKU.” They ran on a platform that included bicycling at KU.
EXISTING CONDITIONS

BICYCLE PARKING FACILITIES

Three bicycle parking audits were recently completed on campus, the most recent being in August and October 2015. Faculty, staff, and students completed the audit by visiting all bicycle parking facilities on campus and taking inventory of the location, design capacity, number of spaces used, and additional notes. The audits were performed based on the existing inventory of bicycle parking shown in Figure 8.

Figure 8: Existing Bicycle Parking Map

Source: KU Center for Sustainability
Analysis of the bicycle parking audit showed areas of under- and over-utilization (above capacity) on campus.

**AREAS OF LOW UTILIZATION**

Watkins (6%), Battenfeld (8%), Fraser (8.5%), Smith (13%), Spooner (0%), Stephenson (6.5%), and much of the West district saw low bicycle parking utilization rates. Further analysis may be needed to understand the reasons behind these low bicycle parking utilization rates.

**AREAS OF HIGH UTILIZATION**

Several residence halls experience high utilization of bicycle parking facilities as shown in Table 3. Current standards for bicycle parking state that residence halls should provide a bike parking space to bed ratio of 30% with at least half of those spaces covered. Table 3 demonstrates that more capacity needs to be added to a number of residence halls to bring them into compliance with the current standards, especially since the bicycle racks at these locations are so heavily utilized.¹

<table>
<thead>
<tr>
<th>Residence Hall</th>
<th>Hall Occupancy</th>
<th>Parking Capacity</th>
<th>Bike Parking Space to Bed Ratio</th>
<th>Percent Occupied at Time of Audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellsworth</td>
<td>580</td>
<td>114</td>
<td>20%</td>
<td>51%</td>
</tr>
<tr>
<td>Hashinger</td>
<td>370</td>
<td>30</td>
<td>8%</td>
<td>70%</td>
</tr>
<tr>
<td>Lewis</td>
<td>280</td>
<td>60</td>
<td>22%</td>
<td>58%</td>
</tr>
<tr>
<td>Oliver</td>
<td>660</td>
<td>172</td>
<td>26%</td>
<td>37%</td>
</tr>
<tr>
<td>GSP</td>
<td>380</td>
<td>26</td>
<td>7%</td>
<td>100%</td>
</tr>
<tr>
<td>Naismith</td>
<td>504</td>
<td>64</td>
<td>13%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Source: BAC September 2015 Bicycle Parking Audit

BICYCLE PARKING AT SCHOLARSHIP HALLS

Unlike other residence halls, most scholarship halls rely upon unsecure, temporary bicycle parking. Table 4 shows bicycle parking utilization for each of the scholarship halls recorded in October 2015.

Each scholarship hall has 50 occupants. Based on current bicycle parking standards, each scholarship hall should have parking for 30% of the occupants (15 spaces). Only four out of 12 scholarship halls currently meet the minimum bicycle parking spaces.

A majority of the scholarship halls are located on a steep hill east of campus. Some bicyclists may prefer to park their bicycle at the top of the hill to avoid carrying their bicycle up stairs or steep slopes to Jayhawk Boulevard. It is possible that a compromise solution is to provide more parking at the top of the hill.

Table 4: Scholarship Halls Bicycle Parking Utilization

<table>
<thead>
<tr>
<th>Scholarship Hall</th>
<th>Type of Parking</th>
<th>Capacity</th>
<th>Occupied Parking Spaces</th>
<th>Percent Occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miller</td>
<td>Half-H</td>
<td>28</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Watkins</td>
<td>Half-H</td>
<td>20</td>
<td>14</td>
<td>70%</td>
</tr>
<tr>
<td>Sellards</td>
<td>Temporary Wheel</td>
<td>10</td>
<td>6</td>
<td>60%</td>
</tr>
<tr>
<td>Pearson</td>
<td>Temporary Slot</td>
<td>28</td>
<td>6</td>
<td>21%</td>
</tr>
<tr>
<td>Battenfeld</td>
<td>Temporary Slot</td>
<td>28</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Stephenson</td>
<td>Temporary Wheel</td>
<td>15</td>
<td>4</td>
<td>27%</td>
</tr>
<tr>
<td>Douthart</td>
<td>Temporary Wheel</td>
<td>14</td>
<td>4</td>
<td>29%</td>
</tr>
<tr>
<td>Grace Pearson</td>
<td>Temporary Wheel</td>
<td>10</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>K.K. Amini (West)</td>
<td>Temporary Slot</td>
<td>28</td>
<td>7</td>
<td>25%</td>
</tr>
<tr>
<td>K.K. Amini (North East)</td>
<td>Temporary Slot</td>
<td>28</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Margeret Amini (West)</td>
<td>Temporary Slot</td>
<td>9</td>
<td>3</td>
<td>33%</td>
</tr>
<tr>
<td>Margeret Amini (South East)</td>
<td>Temporary Slot</td>
<td>8</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Dennis E. Rieger</td>
<td>Half-H</td>
<td>10</td>
<td>7</td>
<td>70%</td>
</tr>
<tr>
<td>Kriehbal</td>
<td>Half-H</td>
<td>18</td>
<td>10</td>
<td>56%</td>
</tr>
</tbody>
</table>

Source: KU BAC 2015 Bicycle Parking Audit
BICYCLE PARKING CHALLENGES

NAISMITH DRIVE & CRESCENT ROAD

The handrail at the southwest corner of Naismith Drive and Crescent Road often has a large number of bicycles secured to it. This reduces the already limited available sidewalk space, making the area extremely challenging for wheelchair users. Based on the number of bicycles along the railing, it is clear that this area could benefit from increased bicycle parking or signage that directs bicyclists to preferred bicycle parking locations. More enforcement may also be required.

RESIDENTIAL PARKING POLICY

The standards for new residence halls on campus requires that bicycle parking be provided for at least 30% of residents, with half of that dedicated to covered bike parking. Many residential locations on campus do not meet this criteria, and there is no covered bicycle parking. Uncovered parking can make choosing to bike particularly difficult after it rains or snow: even if the road is navigable uncovered parking causes a wet/snow-covered seat.

ATHLETIC FIELD BIKE PARKING DESERT

No bicycle parking currently exists at Memorial Stadium and there is a very limited amount at Allen Fieldhouse, two venues that draw thousands of visitors to campus and place stress on neighborhood parking. Programmatic or infrastructure-based solutions may encourage biking to athletic events and help to reduce motor vehicle parking demand at these locations.
BICYCLE APPROACHES TO CAMPUS

The University’s placement on top of a steep hill presents challenges for bicyclists to find efficient routes to Jayhawk Boulevard. Figure 9 shows possible routes from any direction in Lawrence.

FROM THE NORTH

Mississippi Street offers the gentlest slope, although some cyclists may tire of the long, slow hill. One option is to use the Kansas Union parking garage elevator to reach Jayhawk Boulevard instead of climbing past Memorial Drive to the top of the hill.

FROM THE SOUTH

Naismith Drive has sharrows and two lanes of traffic in each direction between 23rd Street and Sunyside Avenue, allowing vehicles to give bicyclists plenty of distance. At the intersection of W. 15th Street and Naismith Drive, bicyclists can turn east up the moderately steep but more bikeable Hoch Auditoria Drive. Another option for bicyclists approaching from the south and farther east is to take Indiana Street to Sunflower Road, which has a similar profile to Mississippi Street.

FROM THE EAST

The slope on this side of the hill is one of the steepest. Apart from lengthy detours to reach Sunflower Road or Mississippi Street, cyclists may be better off taking 13th Street to the base of the hill near Tennessee Street and walking their bicycle the few blocks up to Jayhawk Boulevard.

FROM THE WEST

From 15th Street, cyclists are advised to take Crescent Road to Jayhawk Boulevard. Those taking W. 15th Street will find a steep downhill followed by a steep uphill, a difficult route for most cyclists. From the northwest, campus can be accessed from a marked route along Harvard Road, Sunset Drive, and Stratford Road, which enters campus at West Campus Road.
Figure 10 shows that Iowa Street has the highest traffic volume of the major corridors which can discourage bicyclists from crossing its busy intersections. Campus is also bordered by high volume streets to the south and west. Traffic volumes on and approaching campus from the north and east are much lower in comparison. High traffic volumes on campus near 15th Street and Naismith can also deter cyclists.

To reduce conflicts between pedestrians and vehicles, only KU buses and authorized vehicles can traverse Jayhawk Boulevard from 8 a.m. – 5 p.m. on weekdays. Also, the speed limit on Jayhawk Boulevard is 20 mph.

Source: Kansas Department of Transportation 2013 Traffic Counts
BICYCLE COUNT DATA

The City of Lawrence and Douglas County maintain records of bicycle and pedestrian counts in order to identify priority areas for future investment.1 The counts are part of the National Bicycle & Pedestrian Documentation Project (NBPDP), which aims to establish a consistent methodology and develop a national database of bicycle and pedestrian activity.

The Institute of Transportation Engineers (ITE), along with transportation professionals nationwide, helped develop the methodology, which requires the following guidelines:

- Consistent days and times
- Consistent methods and materials, including training of volunteers
- Centralized data collection and analysis practices

The procedure starts with establishing a “screen line” for each location, which is an invisible plane that crosses the street or sidewalk. When a bicyclist or pedestrian passes the screen line, they are counted. Counts are conducted during three two-hour time slots, and all data is converted to annual bicycle counts for each route segment.

Dates for conducting counts are chosen based on NBPDP’s recommended September count weeks. Counts performed on or near campus in 2014 and 2015 are shown in Table 7 and Table 8.

Table 7: 2014 Annual Bicycle Count Projections - KU Campus

<table>
<thead>
<tr>
<th>Count Location</th>
<th>Annual Projected Count</th>
<th>% Bicycle*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mississippi Street</td>
<td>27,856</td>
<td>8%</td>
</tr>
<tr>
<td>Crescent Road</td>
<td>75,119</td>
<td>20%</td>
</tr>
<tr>
<td>Naismith Drive</td>
<td>47,495</td>
<td>13%</td>
</tr>
</tbody>
</table>

*Remaining percentage is pedestrians


Table 8: 2015 Annual Bicycle Count Projections - KU Campus

<table>
<thead>
<tr>
<th>Count Location</th>
<th>Annual Projected Count</th>
<th>% Bicycle*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jayhawk Boulevard</td>
<td>147,830</td>
<td>5%</td>
</tr>
<tr>
<td>West Campus Road</td>
<td>78,591</td>
<td>7%</td>
</tr>
<tr>
<td>Constant Avenue</td>
<td>27,782</td>
<td>37%</td>
</tr>
<tr>
<td>Irving Hill Bridge</td>
<td>15,848</td>
<td>14%</td>
</tr>
<tr>
<td>Crescent Road</td>
<td>65,678</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Remaining percentage is pedestrians


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1 http://www.lawrenceks.org/mpo/bikepedcount
BICYCLE COUNT DATA

Figure 11 shows the annual average daily trips (ADDT) for pedestrians and bicyclists on and near campus for the five-year period between 2011 and 2015. Jayhawk Boulevard has the highest bicycle and pedestrian AADT. West Campus Road, Sunnyside Avenue, and Irving Hill Road also have large numbers of pedestrians and bicyclists.

BICYCLE COUNT DATA

Figure 12 shows annual average daily traffic mode share near campus based on bicycle and pedestrian count data collected from 2011 to 2015.

CRASH & SAFETY ANALYSIS

Crash reports do not represent the actual number of bicycle crashes because state reports are only filed if the crash includes a motor vehicle. The City of Lawrence has an ordinance requiring that any injury or crash resulting in property damage costs exceeding $50 needs to be reported to the Lawrence Police Department. However, there is ambiguity in the method of determining the incident costs. KU’s Public Safety Department also records crash data that is reported to KDOT using the Kansas Crash Reporting Form. Exact locations of crashes may not be reflected in this map, as crash locations are geocoded based on the written description of the location in the crash report.

Figure 13 shows the location of bicycle crashes in and near KU’s campus. A more detailed corridor analysis by street segment is available in Appendix A. There were 177 bicycle crashes in Lawrence from 2009 to 2013 and 16 crashes occurred on KU’s campus over the same time period. Locations along Iowa Street, W. 19th Street, and W. 15th Street may benefit from education and enforcement campaigns or improved infrastructure to reduce crash risk.
Figure 14 shows that one-third (32%) of Lawrence bicycle crashes between 2009 and 2013 occurred in crosswalks or bikeways. Although intersections are often the location where most conflict points are possible, more crashes occurred outside of an intersection. Because high percentages of crashes occurred in areas where bicyclists both do and do not have available infrastructure, solutions to reduce crashes may be a mix of infrastructure, education, and enforcement.
There is a strong relationship between bicycle crashes and the age cohort of riders. Generally young people have a higher possibility of bicycle crashes than older riders. Figure 15 shows that bicyclists between the ages of 10 and 29 are involved in a higher number of crashes in Lawrence than expected based on demographic data.
Figure 16 shows that the majority of bicycle crashes occurred in no clear weather conditions. However, 13 crashes during rain, mist, or drizzle suggests that there is still an opportunity to educate motorists and bicyclists about safety when weather is less than ideal.
Figure 17 illustrates that the majority of bicycle crashes occurred in daylight. Since most bicycle crashes occurred during the day, other factors may need to be examined to understand how safety could be improved. Twenty-five crashes occurred even though street lights were on.

From 2009-2013, there were two fatal crashes involving bicyclists in Lawrence. Conditions at the time of those fatal crashes were:
- Dark with no street lights (1 case)
- Dusk (1 case)
- No adverse weather (2 cases)
- Dry surface condition (2 cases)
- Ages: 20 and 29

![Figure 17: Light Conditions at Time of Bicycle Crash](image-url)
A review of bicycle plans and planning efforts by other universities provides useful information for KU’s own initiatives and goals. Conducting a peer review allows KU to see how other universities have developed their bicycle plans, and to better understand implementation of various programs, policies, and infrastructure.

Fourteen bicycle plans from other universities were evaluated to determine if programs, policies, or infrastructure ideas could be replicated or adapted at KU. These plans are summarized in Appendix B. Three universities were chosen for a more detailed review:

- University of Colorado Boulder (CU Boulder)
- University of Wisconsin – Madison (Wisconsin-Madison)
- University of California, Davis (UC Davis)

The following sections highlight tools and approaches from these three universities that KU may be able to utilize in the process of creating a more welcoming bicycling environment.

In addition to the peer review, best practices were sought that specifically addressed the issue of encouraging and enabling bicycling in areas with steep terrain. Of particular interest was a white paper included in Seattle’s 2013 bicycle master plan update titled *Bicycling Solutions for Hilly Cities*. This white paper contains a diverse set of ideas for minimizing the negative impacts of steep hills on bicycling.

Another resource for overcoming hills is Flattestroute.com. This website allows users to find the flattest route between an origin and destination without making one go unreasonably out of their way.

With these best practices in mind, this plan makes recommendations that are feasible and will help address the five central goals identified at the beginning of this document.
The University of Colorado Boulder Transportation Master Plan contains a wide range of policies, programs, and infrastructure ideas that support and promote bicycling to, from, and within campus. Three full-time staff members are dedicated to reducing travel demand and provide education to incoming students and new staff members about alternatives to bringing their car to campus. Additionally, there is a Bike Program Manager housed in the Parking and Transportation Services department, providing a consistent point of contact for bike-related issues. The university benefits from several miles of on-street bicycle infrastructure and shared use paths that KU does not currently have. Also, despite its location at the foot of the Rocky Mountains, the campus does not have many challenges with steep slopes, a significant concern in Lawrence. However, many programs, policies, and targeted infrastructure changes that the University of Colorado employs could be applicable tools at KU.

Tools of Interest
University staff conduct annual bicycle parking counts to identify areas of need. The university hopes to find optimal utilization of racks between 65-75%. At this level, the racks appear well-used but spaces are still easy to find. At 75%, racks appear full, and these locations should be considered for additional parking. Consistent analysis like this could help KU to add sufficient bike parking at appropriate locations on campus.

In addition to regular assessment of bicycle parking, annual bicycle counts are used to identify popular access points to and from campus. Knowing which gateways cyclists use to access and leave the university helps determine where additional infrastructure might be needed.

Buff Bikes is a 48-hour rental program, free for students and faculty.

Mobile Mechanic is a free, appointment-based service offered to registered campus bikes.

The university offers bicycle registration to all students and faculty. Registration can help deter theft and makes the process for removing abandoned bikes much easier to implement.

The university offers valet bike parking during football games. Because there is no bike parking available at KU’s football stadium, a temporary bicycle valet system during games could be a way to encourage more bicycle use.
Located on the shores of Lake Mendota, the University of Wisconsin – Madison has a high number of bicyclists that ride to and within campus. In some locations, there are as many as 500 bicyclists per hour. Similar to Boulder, Madison has a well-developed network of on- and off-street bicycle facilities. The university received a Gold Bicycle Friendly University designation in November of 2015, improving upon a previous Silver designation. Additionally, the campus added 4,600 bicycle parking spaces between 2009 and 2015 and now provides more bicycle parking than automobile parking.

However, the UW Campus Master Plan identifies barriers for bicyclists that may sound familiar to cyclists at KU. Perceived lack of safe routes to campus, long travel times, cold weather, and steep slopes are some of the things that discourage riders. There is a strong desire for covered bike parking and bike lockers to help address the sometimes difficult weather conditions. While many bike route signs exist, novices have noted the difficulty of knowing where the route will take them, making wayfinding difficult.

The university has a long range transportation plan that identifies goals of making safer and more convenient routes to campus for cyclists and providing amenities to improve comfort during extreme weather.

**Tools of Interest**

The University of Wisconsin – Madison opened a University Bicycle Resource Center in 2012 that serves as a hub for bicycle programming, education, and maintenance. The Bicycle Resource Center is managed and funded through University Transportation Services (TS). Committing staff time and resources to bicycle issues at KU could help improve the bicycling environment on the Lawrence campus.

The university’s campus boasts over a dozen outdoor self-serve “air and repair” stations, providing easy access to tune-ups for riders.

University Facilities staff follow Technical Guidelines that provide guidance on bicycle parking for all new development, including a requirement for bicycle parking for 50% of residents in campus dormitories.

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2. [http://masterplan.wisc.edu/Trans_LRTP_031808.pdf](http://masterplan.wisc.edu/Trans_LRTP_031808.pdf)
The University of California, Davis is located in Davis, California, the only city in the United States with a Platinum Bike Friendly Community designation. The university also carries a Platinum designation along with only four other colleges. The City of Davis has the highest rate of bicycle commuters in the U.S., at 23%. Because of the high number of bicyclists in the city and at the university, the investment and consideration of bicycle policies, programs, and infrastructure may not be as hard of a sell as in most other cities with a bicycle mode share of 3% or less. However, there are a multitude of things that UC Davis does well and several of these could be implemented on KU’s campus.

**Tools of Interest**

The UC Davis Transportation and Parking Services (TAPS) distributes annual digital and paper fliers with information about successful cycling on campus.

The university provides a 19-minute bike safety video titled “How to Avoid Face Plants” that is free for anyone to watch, but mandatory for cyclists who are issued citations.

Like many of the peer reviewed universities, UC Davis commits staff time to bicycling issues through its Bicycle Coordinator position in TAPS. This coordinator is responsible for much of the education and encouragement programming on campus and must be a certified League Cycling Instructor.

In addition to the Bicycle Coordinator, UC Davis has a Committee on Bicycle Programs within TAPS that helps guide bicycle programming and development on campus, much like the KU BAC.

TAPS provides bicycle locks to students who have lost their bicycle keys.

The university provides temporary and short term automobile parking permits for faculty and staff who regularly cycle or ride transit, allowing 12 days of parking per six month period.
RESOURCES FOR HILLY TERRAIN

Although many innovative ideas were identified in the peer review process, gaps still remain. Of particular interest to the success of this plan is providing recommendations on how to overcome the real and perceived barrier of moving people on bikes up and down the hill of Mount Oread. For that reason, more resources were sought to better understand what tools might exist to overcome this barrier.

Two resources stood out as having ideas that may be useful for the University of Kansas:

1. The City of Seattle included a white paper as part of its 2013 Bicycle Master Plan Update titled *Bicycling Solutions for Hilly Cities*1 that contains many possible methods for encouraging bicycling, even in hilly areas.
2. Flattestroute.com is a free resource that aids in route finding, with an easy-to-use interface.

Tools of Interest

- **Stair channels**, sometimes called *runnels*, allow one to walk their bicycle up and down stairs without lifting it or bouncing it down the stairway.

- Route identification through signage helps riders avoid the steepest hills.

- Electric bicycles operating within a bike share system are a great option for bicyclists moving uphill.

- Promotion and encouragement of biking hills as a source of city pride can change the tone of the conversation.

- Tailored for bicycle trips, flattestroute.com allows riders to input in an origin and destination, then the site will identify the most direct route that limits steep sections of street.
CONCLUSION

The best practices peer review resulted in the identification of several policies, programs, and infrastructure ideas that KU could use to achieve the goals set out by this plan.

A consistent finding in the peer review process was the commitment of staff to bicycle education, programming, and development. In some cases, it came in the form of a bicycle program coordinator and in others, responsibilities were shared among multiple staff within the Parking and Transit department. It is clear that staff dedication to bicycle issues can greatly support the development of policies, programs, and infrastructure that improve the bicycling environment.

Each peer-reviewed university offered tools that could be implemented or adapted for use at KU. Colorado’s model of considering bicycles as a solution to travel demand management could be an avenue worth exploring, given the challenges with parking on and around campus. Wisconsin’s strong technical guidelines ensure that bicycles are considered anytime that streets or buildings are constructed or reconstructed. California’s creativity with education, encouragement, and short-term parking passes indicate a deep understanding of the many real and perceived barriers that can prevent people from choosing to ride a bicycle.

Additional tools to address steep terrain provided a number of ideas that KU may be able to use as well.

With these tools in mind, the following sections present short- and long-term recommendations for improving the bicycling environment at KU.

This plan seeks to address 5 goals:

1. Enhance the multimodal network linking residential, academic, and recreational destinations on campus and in the community
2. Promote a safe, healthy campus environment
3. Increase bicycle and pedestrian mode share through the implementation of new policies, programs, and infrastructure
4. Improve coordination with the City of Lawrence and create seamless transitions between university and city bike routes and infrastructure
5. Improve movement uphill by identifying policy, program, and infrastructure solutions that encourage people to overcome the real and perceived barrier of steep routes to campus

Each of the following recommendations addresses at least one of those goals through the 5 E’s of bicycling: Education, Encouragement, Enforcement, Engineering, and Evaluation.

In both short- and long-term recommendations, the key priorities are been identified.

**Engineering** refers to physical infrastructure. This category is typically thought of when people think about “plans.” Engineering recommendations are typically prioritized based on cost and ease of implementation and may include:
- On-street facilities such as bike lanes, sharrows, and traffic calming
- Off-street paths
- Directional and wayfinding signage
- Bicycle and pedestrian bridges and tunnels
- Bike parking facilities
- Anything physical in nature that facilitates bicycle travel

**Education** efforts typically focus on educating people about the rules of the road. It may focus on teaching cyclists how to properly interact with motorists and how to avoid the most common dangerous situations that occur for cyclists. Education may also focus on awareness that cyclists must follow the same rules of the road as motorists. Motorist education typically focuses on reminding motorists of the rules of the road, and how to properly interact with bicyclists and pedestrians. Education efforts may include:
- Bike rodeos and helmet fairs
- Public service announcements
- Workshops for planners, engineers, and law enforcement officials
- Driver education and safe cycling classes

**Encouragement** activities focus on increasing bicycling and walking through fun and interesting activities. These activities may include:
- Bike to Work Week activities
- Bike and Walk to School Days
- Workplace wellness programs
- Open streets events (Example: Ciclovias)
- Community bike rides
- Bicycle maps
- Bike share systems

**Enforcement** activities focus on enforcing the rules of the road for all users including motorists, bicyclists, and pedestrians. Enforcement also prioritizes having and improving links between the law enforcement and bicycling communities. Activities may include efforts to:
- Reduce speeding
- Increase motorists yielding to pedestrians and bicyclists when appropriate
- Reduce bicycle theft

**Evaluation** efforts seek to quantify the impacts of the other E’s and may include:
- Measuring the growth of bicycle and pedestrian facilities in a region
- Measuring the rate of bicycling in an area or the number of users on a specific facility
- Evaluating crash data for patterns and/or frequency
**SHORT TERM RECOMMENDATIONS (1-3 YEARS)**

**Identify funding and hire a Campus Bicycle Coordinator**

The peer review process illuminated the importance of university staff dedicated to improving the bicycling environment. A campus bike coordinator could help inform land development decisions, provide education and encouragement for students, faculty, and staff, and implement recommendations from the KU Bike Plan. This position could allow for the KU BAC to become the body that guides the coordinator’s work, much like the Lawrence-Douglas County BAC does for City-County transportation planners. A campus bike coordinator would also provide a clear point of contact for the public to engage the university on bicycling issues and concerns.

**Establish a review process for all construction projects to allow the KU BAC to provide feedback on bike infrastructure.**

Inclusion of an appointed member of the KU BAC or the Campus Bicycle Coordinator in design review is important to enhancing reasonable multimodal travel options on and around campus. To prevent the need for retrofitting and provide thoughtful execution of new bicycle infrastructure, it is important that bicycles be considered in the early stages of campus development or redevelopment.

**Identify locations for bicycle signage including ‘3-foot passing law’ and ‘Bicycle may use full lane’ signs.**

The Lawrence-Douglas County Bicycle Advisory Committee recommends locations for each of these sign types throughout the Lawrence community. The Douglas County BAC suggested ‘3-foot passing law’ signs be used as motorists enter Lawrence city limits. ‘Bicycle may use full lane’ signs are suggested where streets become more narrow, typically at locations of traffic calming such as roundabouts and pedestrian islands or at the entrances to campus.

**Adopt proposed short- and long-term bicycle parking guidelines into campus Design and Construction Standards.**

Short term parking is designed for people visiting a location for no more than 2 hours. This type of parking should be visible and easy to access from the front door of the building. The guidelines developed by KU BAC in 2015 recommend providing bicycle parking for a minimum of 2.5% regular building occupants and visitors.

Long term parking places higher value on security and weather protection and is often designed for residents, employees, transit users, and others who may need to leave their bicycle parked in one location for several hours or all day.

The KU BAC guidelines include a 30% bike parking to bed ratio for all existing and newly constructed residence halls, with 50% of bike parking to be covered. This design guideline was developed to ensure that on-campus students have secure, convenient, and protected parking for their bicycle. These amenities could lead to more students choosing to bring a bike to campus instead of a car, reducing the high automobile parking demand found near most university residence halls.

**Develop standards to accommodate biking during construction.**

On campus construction can sometimes prevent cyclists from accessing parking or discourage those who use only familiar routes to campus. Bicycle detours should be provided with improved signage to allow access where possible and direct cyclists to alternative routes or parking if necessary.
SHORT TERM RECOMMENDATIONS (1-3 YEARS)

Install sharrow markings along bike routes identified in the Campus Master Plan and Douglas County Bikeway System Plan.

A prioritized list of locations is:
1. Mississippi Street from Fambrough Drive to Jayhawk Boulevard
2. Memorial Drive from Mississippi Street to West Campus Road
3. Constant Avenue from 21st Street to 19th Street.

Identify key locations throughout campus to install bike maintenance facilities.

KU currently has two bike repair stands: one on the south side of the student recreation center and one at the Kansas Union. However, if a cyclist encounters a flat tire on Jayhawk Boulevard, it would be time consuming and inconvenient to walk his or her bike down the hill to make the needed repairs. Work should be done to identify locations for repair stands throughout campus that allow cyclists to conveniently make small repairs and tune-ups as necessary without having to travel great distances.

Consolidate bike related resources to a single website at bike.ku.edu.

For those looking for bicycling resources, it is most convenient to compile health, environmental, safety, route-finding, and technical information in one location.

Links to bike.ku.edu could be provided on the websites of Parking & Transit, Public Safety, Recreation Services, and the Center for Sustainability to direct those seeking bicycle related information to a central source.

Establish an annual education, encouragement, and enforcement campaign.

An annual campaign could include the following:
- Bike tours, safety information, maintenance demonstrations, cycling skills classes, inclusion of bike routes on Parking and Transit maps, bike info on bus advertisement rails, wayfinding information for surrounding neighborhoods, biannual news articles in the UDK with information on motorist and bicycle safety, etc.
- Students could also be informed about local bicycle shops and co-ops, social bicycle clubs, and student organizations.

Enforcement campaigns that also educate motorists and bicyclists about the rules of the road have proven to be very effective at changing behavior.

KU Public Safety could dispense bicycling rules of the road information during annual enforcement of yielding, speeding, and 3-foot passing laws at certain campus locations.

Incoming students of all levels are usually unfamiliar with existing programs. It is important to educate them students as early as possible in order to influence future habits.

Provide Share the Road educational materials to pedestrians, bicyclists, motorists, police officers, and campus neighbors.

Information can be distributed with parking permit materials, future bicycle registration, and at student information fairs.
Pursue Bicycle Friendly University designation.

KU submitted an application for BFU designation in August 2016. Regardless of achieving a platinum, gold, silver, or bronze designation, another benefit of applying for BFU designation is the feedback received from the application process. While KU's 2012 application did not result in a designation, The League of American Bicyclists included a list of suggested improvements for KU to consider before its next application. These suggestions have led to the creation of the KU Bicycle Advisory Committee and the development of this KU Bike Plan. The 2016 application should reflect progress and will also be an opportunity to learn what else KU can do to become more bicycle friendly.

Improve visibility of bicycle amenities near the KU Visitor Center.

The Visitor Center welcomes many prospective students and families to the University of Kansas campus. This makes it a great place to send the message that KU is a bike-friendly campus and Lawrence a bike-friendly city. The current lack of bicycle infrastructure and information does not take advantage of conveying this message to new Jayhawks.

Bicycle parking, a bike repair stand, or educational materials within the building would help make visitors and prospective students aware of the bicycle amenities and programs on campus.

Provide bicycle registration through the Parking & Transit website.

Bicycle registration helps to prevent stolen bicycles by linking bikes with owners through a serial number or tagging process. An additional benefit to registration is the ability to contact bike owners prior to the removal of abandoned bicycles from racks at the end of each semester. The current process for bike removal requires cyclists to label their bikes with “Do Not Remove” tags at the end of the school year. If bike owners fail to do this, they may have to reclaim their bike from KU at a later date, with no way of verifying that they are the owner.

Promote annual participation in the National Bike Challenge through social media tools.

Encouragement from the official KU Twitter and Facebook pages to participate in the National Bike Challenge would be the most effective way to reach all current and former Jayhawks who are interested in competing with other universities to log bike miles throughout the year. Apps that automatically log daily miles make it easy to participate and represent cycling at KU.
SHORT TERM RECOMMENDATIONS (1-3 YEARS)

Continue annual bicycle and pedestrian counts at key campus locations and conduct routine bicycle parking capacity and usage counts.

Count locations should be chosen to provide information on where bicyclists access campus. Knowing the top entry points for cyclists will help determine where infrastructure is most needed.

Annual bicycle parking counts allow evaluation of areas with high and low utilization, helping to prioritize areas of campus in need of additional parking facilities. These counts also provide the opportunity to report damaged bicycle racks in need of repair or overgrown vegetation that prevents easy access to parking. These counts should be standardized to a certain time of year.

Identify high-risk crash locations on campus and develop plan for mitigation.

The map on page 30 identifies locations on and around campus that have seen bicycle crashes in the last five years. Safety issues are likely different at each location and require a different set of education and infrastructure tools to address them. Historical crash locations and perceived high-risk locations should be analyzed to better understand how to improve safety.

Explore development of a bike share program to provide access to bikes on campus and connections to key points in the community.

In 2016 the Lawrence-Douglas County Metropolitan Planning Organization (MPO) engaged the Toole Design Group to assist with a feasibility study to examine options for a bike share program in the community. The report recommends including the University of Kansas Lawrence Campus and connections to downtown in the first phase of implementation, and identifies the university as a key partner in establishing a program.

The group also conducted a survey of KU students to determine interest in such a program. Out of 693 students surveyed:
- 81% indicated support for a campus bike share
- 70% indicated support for using student fees to pay for a bike share system if the fees guaranteed free use of the bikes for a period of time each day
- 87% would be more likely to use bike share if their KU Card could be used to check out a bike

Additional study is needed to determine how such a program would be operated on campus in coordination with off-campus stations, and how to best fund both capital and operational costs.

1 Full report is available at http://lawrenceks.org/mpo/bikeshare/
LONG TERM RECOMMENDATIONS (4-10 YEARS)

Add bicycle infrastructure during construction or reconstruction of streets, buildings, and parking lots on campus.

The ideal time to add new bicycle infrastructure is during already planned construction or reconstruction projects. For example, planned reconstruction of campus parking lots presents an opportunity to add bike parking in areas of campus where it is currently inadequate.

Also, anytime bus shelters are constructed or reconstructed, the addition of bicycle parking near the shelter would encourage multimodal trips for bicyclists connecting with transit.

Develop a connection to the existing shared use path north of Clinton Parkway and Atchison Avenue.

Figure 18 shows that this trail terminates at the corner of W. 19th Street and Heatherwood Drive, approximately 1,000 feet west of KU property. If connected, bicyclists would be able to bike along Westbrooke Road to reach existing shared use path along Bob Billings Parkway. Alternatively, cyclists could use Petefish Drive to reach The Lied Center, connecting them with Daisy Hill and the rest of campus. A short connection here could help bicyclists southwest of campus avoid the heavy traffic of 23rd Street and Iowa Street while commuting to Mouth Oread.

Add climbing lanes and signage to routes identified in the Campus Master Plan and the Countywide Bikeway System Plan.

These routes include:
1. Sunflower Road between Sunnyside Avenue and Jayhawk Boulevard
2. 11th Street from Maine Street to West Campus Road
3. Irving Hill Road from Naismith Drive to Engel Road
LONG TERM RECOMMENDATIONS (4-10 YEARS)

**Develop standards for end-of-trip facilities in campus buildings.**

Similar to bicycle parking guidelines developed by KU BAC, consistent standards should be required for end-of-trip facilities such as lockers and showers in new campus buildings.

Biking in extreme heat, cold, or over long distances can make it difficult for cyclists to arrive to work or class in clean, professional clothing. End-of-trip facilities can help commuters choose to bike while still arriving presentably at their destination.

**Make continuous connections to the Jayhawk Trail as redevelopment occurs.**

The Jayhawk Trail is a concept to connect all three districts of campus with a single shared use walking and biking trail. While the final alignment is still evolving, connections should be ensured from 19th & Iowa Streets to 15th Street & Naismith Drive, as well as a connection from 15th Street & Naismith Drive to Jayhawk Boulevard.

**Amend wayfinding signage standards to include guidelines for directing bicyclists to routes and/or depicting time and distance information.**

Wayfinding signage can be used as a tool for encouragement as it clarifies the time, distance, or direction of routes for current and prospective bicyclists.

KU developed consistent wayfinding signage standards in 20091 that do not include information for bicycles. The university should consider amending these standards to include information helpful to bicyclists.

Figure 19 shows current DCM standards for one wayfinding sign type.

**Install on- or off-street bikeway facilities along high traffic campus corridors.**

On-street facilities may include shared-use lanes with sharrows, bicycle lanes, or cycle tracks. Off-street facilities often include shared-use paths for bicyclists and pedestrians. Further descriptions of bicycle facility types can be found in Appendix C. Design of facilities should meet AASHTO2 or NACTO3 guidelines.

These routes have been identified in the Countywide Bikeway Plan to have future bike facilities:

1. Jayhawk Boulevard from West Campus Road to 12th Street
2. Naismith Drive from 19th Street to Sunnyside Avenue
3. Irving Hill Road from Engel Road to Naismith Drive
4. West 15th Street from Engel Road to Naismith Drive

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1. [https://dcm.ku.edu/sites/dcm.drupal.ku.edu/files/docs/Standards/KUEWsummary.pdf](https://dcm.ku.edu/sites/dcm.drupal.ku.edu/files/docs/Standards/KUEWsummary.pdf)
LONG TERM RECOMMENDATIONS (4-10 YEARS)

Explore solutions for improving bicycling along Sunnyside Avenue.

While this road has not had a reported bicycling crash in the last five years, it is perceived as a dangerous route for cyclists. Cars sometimes speed on the long, straight road, and cyclists must watch out for cars reversing from angled parking spots or entering the roadway from the one of the many driveways on this street.

Potential treatments could include reverse angled parking, traffic calming speed humps, installing bike lanes, or adding a two-way cycle track on the north side of the street.

Identify locations for central bike parking hubs at key intersections with other modes of transportation.

The City of Lawrence and the University of Kansas submitted a joint application for a TIGER grant to fund a multimodal transit facility in Lot 90 (near the student recreation center) that could have included significant space dedicated to bicycle facilities. Unfortunately, the grant was not awarded.

Nonetheless, the university should continue to work to identify key locations on campus for consolidated bicycle amenities, including but not limited to covered parking, secure bicycle lockers, and bicycle repair stations.

Perform walking and biking safety corridor analyses for major streets on campus.

In 2015, a Road Safety Assessment (RSA) was conducted for the 19th Street Corridor from Barker Avenue to Iowa Street. The RSA is part of a U.S. DOT initiative to reduce bicycle & pedestrian injuries by helping communities build streets that are safer for pedestrians, bicyclists, and transit riders.

Similar assessments should be conducted on other major streets on campus, including but not limited to:
- Naismith Drive from 19th Street to Crescent Road
- 15th Street from Iowa Street to Naismith Drive
- Sunnyside Avenue from Naismith Drive to Sunflower Road
- Jayhawk Boulevard from Naismith Drive to West 13th Street
- West Campus Road from West 11th Street to Jayhawk Boulevard

Following these assessments, it may make sense to install traffic calming devices in some locations to improve pedestrian safety and comfort.
RECOMMENDATIONS - CONNECTIVITY WITH THE CITY

Campus boundaries are invisible to the cyclist who travels to and from Mount Oread. Bicycle connections between city and KU property should be seamless and coordinated, leading cyclists along desired routes.

Campus is bordered by several arterial streets that are part of the city’s principal road network. These high-traffic streets are a necessary component of moving people efficiently through Lawrence. Although the movement of cars along these routes is essential, consideration of bicycle travel across and along these streets is necessary to ensure that long-term barriers do not develop that limit direct route options for bicyclists.

This plan highlights certain corridors and gateways that students use to access campus. As streets near these corridors and gateways are maintained or rebuilt, consideration should be given to roadway treatements that align with City and KU plans and improve the safety and comfort for bicyclists.

The City of Lawrence and the University of Kansas should develop a consistent and coordinated design review process for projects that impact both entities.

This process should allow all appropriate staff and advisory boards at KU and the City to review and comment on projects that may affect bicyclists. One example of successful coordination is through the Bike Share Feasibility Study in 2016. Representatives from the Lawrence-Douglas County MPO, Lawrence Transit, KU Parking & Transit, and KU Student Senate, among others, were all involved in discussions throughout the study and had several opportunities to voice concerns.
RECOMMENDATIONS - CONNECTING IMPLEMENTATION TO GOAL-SETTING

The following table demonstrates how each recommendation in this plan addresses one of the five overarching goals through the five E's of bicycling. Through engineering, education, encouragement, enforcement, and evaluation, KU can begin to achieve the goals of this plan in both the short-term and the long-term.

<table>
<thead>
<tr>
<th>Short-Term Recommendations</th>
<th>Engineering</th>
<th>Education</th>
<th>Enforcement</th>
<th>Evaluation</th>
<th>Enhance Bikeway Network</th>
<th>Promote Safety and Health</th>
<th>Increase % Bicyclists</th>
<th>Improve Coordination</th>
<th>Create Movement Uphill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify funding and hire Bicycle Campus Coordinator.</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Establish review process for all construction projects to allow the KU BAC to provide feedback on bike infrastructure.</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Identify locations for bicycle signage including ’3-foot passing law’ and ’Bicycle may use full lane’ signs.</td>
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<tr>
<td>Adopt short- and long-term bicycle parking guidelines proposed by KU BAC into Design and Construction Standards.</td>
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<tr>
<td>Develop standards to accommodate biking during construction.</td>
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<tr>
<td>Install sharrow markings along bike routes identified in the Campus Master Plan and Douglas County Bikeway System Plan.</td>
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<td>x</td>
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<tr>
<td>Identify key locations throughout campus to install bike maintenance facilities.</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Consolidate bike related resources to a single site at bike.ku.edu.</td>
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<td>x</td>
<td>x</td>
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<tr>
<td>Establish an annual education, encouragement, and enforcement campaign.</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Provide Share the Road educational materials to pedestrians, bicyclists, motorists, police officers, and campus neighbors.</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Pursue Bicycle Friendly University designation.</td>
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<tr>
<td>Improve visibility of bicycle amenities nearby the KU Visitor Center.</td>
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<tr>
<td>Promote annual participation in the National Bike Challenge through social media tools.</td>
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<td>x</td>
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<tr>
<td>Provide bicycle registration through the Parking and Transit website.</td>
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<tr>
<td>Continue annual bicycle and pedestrian counts at key campus locations and annual bicycle parking capacity and usage counts.</td>
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<tr>
<td>Identify high-risk crash locations on campus and develop plan for mitigation.</td>
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<tr>
<td>Explore development of a bike share program to provide access to bikes on campus and connections to key points in the community.</td>
<td>x</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-Term Recommendations</th>
<th>5 E's</th>
<th>Plan Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add bicycle infrastructure during construction or reconstruction of streets, buildings, and parking lots on campus.</td>
<td>x</td>
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</tr>
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<td>Develop a connection to the existing shared use path north of Clinton Parkway and Atchison Avenue.</td>
<td>x</td>
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<td>Add climbing lanes and appropriate signage to routes identified in the Campus Master Plan and the Countywide Bikeway System Plan.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Develop standards for end-of-trip facilities in campus buildings.</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Make continuous connections for the Jayhawk Trail as redevelopment occurs.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Amend wayfinding signage standards to include guidelines for directing bicyclists to routes and/or depicting time and distance information.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Install on- or off-street bicycle facilities along high traffic campus corridors.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Explore solutions for improving bicycling along Sunnyside Avenue.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Identify locations for central bike parking hubs at key intersections with other modes of transportation.</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Perform walking and biking safety corridor analyses for major streets on campus.</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

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49 KU BIKE PLAN 2016
FUNDING

KU receives funding from many different sources. In fiscal year 2014, tuition and fees (23%) and grants and contracts (23%) accounted for nearly half of university revenues.

Figure 20: 2014 KU Revenue Split

http://publicaffairs.ku.edu/sites/publicaffairs.ku.edu/files/docs/FY2014_Revenues.pdf

KU also depends on the generous donations of its alumni network. These campaigns are often run through KU Endowment, a University led group dedicated to reaching out to the alumni network for donations. 2015 fundraising efforts led to $135.4 million of outright gifts and pledges.¹

Under the Fixing America’s Surface Transportation (FAST) Act, funding for bicycle, pedestrian, and other alternative projects is provided through the Surface Transportation Block Grant Program (STP GP). Because the urbanized area of Douglas County does not have over 200,000 people, the Lawrence-Douglas County MPO is not a direct recipient of this funding. Instead, the funding is given to KDOT, who may choose to award up to 50% of their STP DG funds to any project type, not specifically bicycle, pedestrian, or other alternative transportation projects. Municipalities, universities, and other organizations across the state can submit project applications to KDOT to receive a portion of this funding. However, the need for funding consistently outweighs its availability.

Student fees, which are allocated by KU’s Student Senate are another potential source of funding. The free review process takes place early in the spring semester each year. It is important to note, however, that efforts to implement new fees are generally more well received if spearheaded by students, not staff.

Current fees support KU on Wheels, the Recreation Center, Watkins Health Center, Memorial Unions, and KU Recycling, among others.

KU could pursue funding for KU Bike Plan recommendations from a combination of these sources. Some recommendations may be appealing to alumni looking to promote bicycling at KU. Others may be important enough to students to include in annual required campus fees set by the Student Senate. Still others may require a corporate sponsorship, such as bike share programs in many cities. A host of included recommendations require very little funding, but will require current staff to expand their duties or volunteers to provide support.

¹ https://issuu.com/kuendowment/docs/kue_2015_annual_report_issuu
CONCLUSION

The KU Bike Plan shines a light on existing conditions and concerns, identifies tools to address those issues, and presents realistic actions that can be taken to improve the bicycling environment at KU.

This planning process began with the desire to address five goals:

• **Enhance the bicycle network linking residential, academic, and recreational destinations on campus and in the community**

• **Promote a safe, healthy campus environment**

• **Increase the percentage of bicycle and pedestrian users on campus through the implementation of new policies, programs, and infrastructure**

• **Improve coordination with the City of Lawrence and create seamless transitions between university and City bike infrastructure and routes**

• **Create movement uphill by identifying policy, program, and infrastructure solutions that encourage people to overcome the real and perceived barrier of steep routes to campus**

Through careful analysis, thoughtful discussion, and pragmatic recommendations, this plan proposes concrete action to address each identified goal.

The plan identifies the current state of bicycling on and around campus and discusses opportunities and challenges that exist at the university. It uses public input, reviews best practices, and identifies funding source to establish a set of recommendations that are both feasible and visionary, creating a better bicycling environment and laying the groundwork for long term goals.

This document is important because it enables consistent decisions to be made about future bicycle infrastructure and plans on campus. It provides unique solutions to known bicycling challenges and offers guidance and flexibility in the details of implementation. The KU Bike Plan was developed with input from students, faculty, and staff from KU Parking & Transit, Design and Construction Management, the Center for Sustainability, the Public Safety Office, City of Lawrence staff, and many others. This diversity of perspectives led to recommendations that take into account the priorities and limitations of decision-makers at the university and the City.

The momentum is building for a better bicycling environment at KU. With this plan as a guide, the pursuit of our goals begins now.
The following corridor safety analysis was completed by graduate students in the Spring 2016 Urban Planning Transportation Implementation class. This is a preliminary study to begin to identify areas that may require more detailed analysis to assess safety concerns on campus and in surrounding neighborhoods.

For the purpose of this study, an analysis of the three districts identified in the Campus Master Plan was completed, along with neighborhood areas located off campus. Figure 21 shows the district boundaries.

The corridor safety analysis uses crashes per mile to identify roadway segments that have been historically dangerous. Roadways were individually evaluated, but roads that extended in multiple districts were divided into separate corridors for the purpose of this analysis, as well as roadways that had distinctly different characteristics along different segments.

Corridor safety analysis included the following:

- Corridor Length
- Total Pedestrian & Cyclist Crashes
- Annual Pedestrian & Cyclist Crashes per Mile
- Recommended Facility Type by the City of Lawrence
- Roadway Classification
- Posted Speed Limit
- Existing Bicycle Infrastructure
- AADT (autos)
- Parking Infrastructure
- Slope
- Number of Lanes
- Roadway Width
- Roadway Surface/Material

Each of the following district sub-sections include a summary table for the corridors located in the district.
Figure 21: District Designations

West District

Central District

North District
**NORTH DISTRICT**

**KEY CORRIDORS & LAND USE**

The land use in the North District is mainly institutional and numerous buildings within the district are listed as historic sites (Marvin Hall, Spooner Hall, Dyche Hall, Lippincott Hall, Strong Hall, Baily Hall, Blake Hall). One of the main features in this district is Jayhawk Boulevard, in the heart of campus.

The sidewalks along Jayhawk Boulevard are probably the most used on campus and Wescoe Beach is also a place where many student activities occur. The underground food court at Wescoe Hall is also a common meeting place for students, staff, and others.

Jayhawk Boulevard is one of the main corridors in the North District with ADT at just over 4,500 in 2013. As it is the heart of campus, the numbers of bicyclists and pedestrians on this corridor is very high. Also, the rate of bicyclist and pedestrian crashes is highest in the North District with 7.14 average annual crashes per mile.

It is noteworthy that this corridor is restricted from through traffic from 7 a.m. to 5 p.m. on weekdays. The purpose is to reduce the through traffic on this corridor and minimize the conflicts among motor vehicles, bicyclists and pedestrians. Currently there is no designated bike lane on this corridor, but some bicyclists use the sidewalk or road for bicycling.

KU completed an $11 million reconstruction of Jayhawk Boulevard in 2014 to improve pedestrian and bicycle accessibility and safety, roadway infrastructure, utilities, bus circulation and to restore the historic tree-lined character of the original Jayhawk Boulevard.

Due to moderate to steep slopes on Sunflower Road, Naismith Drive (within the North District only), and Hoch Auditorium Drive, bicycling on these route segments is more difficult than flatter surfaces (Memorial Drive and Sunnyside Avenue). Sunnyside Avenue and Sunflower Road have an average bicycle and pedestrian crash rate of just over 3.7 average annual crashes per mile.

There is no bike infrastructure on these corridors now, but the City of Lawrence has proposals for these corridors such as separate bicycle routes, bike lanes and shared used paths.
### Table 9: North District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual Crashes Per Mile</th>
<th>Previously Recommended Facility Type</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoch Auditoria Drive</td>
<td>Naismith Drive to Art and Design Building</td>
<td>0.00</td>
<td>Shared Use Path</td>
<td>None</td>
<td>N/A</td>
<td>None</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Sunnyside Avenue</td>
<td>Naismith Drive to Edgehill Road</td>
<td>0.75</td>
<td>Bike Lane &amp; Bike Route</td>
<td>None</td>
<td>5,690</td>
<td>Parallel on Southbound</td>
<td>Moderately Flat</td>
</tr>
<tr>
<td>Jayhawk Boulevard</td>
<td>West Campus Road to West 13th Street</td>
<td>1.43</td>
<td>Bike Lane</td>
<td>None</td>
<td>4,558</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
<tr>
<td>Fambrough Way</td>
<td>West 11th Street to Parking Lot 59</td>
<td>0.00</td>
<td>Bike Route</td>
<td>None</td>
<td>N/A</td>
<td>Parallel</td>
<td>Flat</td>
</tr>
<tr>
<td>Extension to Memorial Drive</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Naismith Drive</td>
<td>University Drive to West 15th Street</td>
<td>1.33</td>
<td>Bike Lane (West 19th Street to Crescent Road)</td>
<td>Bike Route (West 23rd Street to West 19th Street)</td>
<td>6,265 - 10,261</td>
<td>None</td>
<td>Steep</td>
</tr>
<tr>
<td>Jayhawk Trail (Mid Hill Walk)</td>
<td>West 19th Street to West 15th Street</td>
<td>N/A</td>
<td>Shared Use Path</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sunflower</td>
<td>Jayhawk Boulevard to Indiana Street</td>
<td>0.74</td>
<td>Climbing Lane</td>
<td>None</td>
<td>N/A</td>
<td>Parallel on Southbound</td>
<td>Steep</td>
</tr>
<tr>
<td>Memorial Drive</td>
<td>West campus Road to Mississippi Street</td>
<td>0.00</td>
<td>Shared Lane Marking &amp; Bike Route</td>
<td>None</td>
<td>1,054</td>
<td>Parallel &amp; Perpendicular</td>
<td>Moderately Flat</td>
</tr>
</tbody>
</table>
CENTRAL DISTRICT
KEY CORRIDORS & LAND USE

West 15th Street is one of the highest trafficked roads on KU’s campus and averages 8,135 ADT. It serves as a key corridor for people entering campus from the northwest; cutting directly to the heart of campus. Naismith Drive, running north to south is also a highly trafficked road. Both Naismith Drive and Irving Hill Road are determined to be high risk corridors based on a corridor safety analysis as they both see an average of greater than one annual pedestrian or bicycle crash per mile.

The eastern portion of this district includes property south of Sunnyside Avenue and includes Lot 90, which is one of the largest parking lots on campus, and was under study for reconstruction with a parking garage, covered bicycle parking, and possible transit center.
Table 10: Central District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual Crashes Per Mile</th>
<th>Previously Recommended Facility Type by the City of Lawrence</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 15th Street</td>
<td>Iowa Street to Naismith Drive</td>
<td>0.91</td>
<td>Shared Use Path</td>
<td>None</td>
<td>8,135</td>
<td>No</td>
<td>Steep</td>
</tr>
<tr>
<td>Naismith Drive</td>
<td>West 15th Street to West 19th Street</td>
<td>1.60</td>
<td>Bike Lane (19th Street to Crescent Road)</td>
<td>Bike Route (W 23rd Street to 19th Street)</td>
<td>6,265</td>
<td>No</td>
<td>Moderately Flat - Moderately Steep</td>
</tr>
<tr>
<td>Irving Hill Road</td>
<td>Iowa Street to Naismith Drive</td>
<td>2.00</td>
<td>Bike Lane (Engel Road to Naismith Drive)</td>
<td>Shared use paths (Crestline Drive to Iowa Street), Bike route (Iowa Street to Engel Road)</td>
<td>4,617</td>
<td>No</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Jayhawk Trail (Central Portion)</td>
<td>West 19th Street to West 15th Street</td>
<td>N/A</td>
<td>Shared Use Path</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ellis Drive (Path)</td>
<td>West 19th Street to Irving Hill Road</td>
<td>N/A</td>
<td>Shared Use Path</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
<td>Moderately Steep</td>
</tr>
</tbody>
</table>
WEST DISTRICT

For the purpose of this study, the neighborhood to the southwest of West District was included in the analysis, creating a study area bound by Kasold Drive, Bob Billings Parkway, Iowa Street, and Clinton Parkway.

Many of the roads and streets in this district currently have some form of bicycle infrastructure. Constant Avenue from Irving Hill Road to West 19th Street features a shared use path. Another section from West 19th Street to West 21st Street does not have bicycle infrastructure. According to survey data, there is a shortage of bicycle signage along some roads that already have existing bicycle infrastructure, like Constant Avenue, Becker Drive, and Kasold Drive.

Future improvements to the Jayhawk Trail, and the “Heatherwood” Trail (running north and south through the neighborhood to the southeast) would also benefit from well-designed bicycle signage.

In this district, as in the others, it is important to consider the road slopes. In the institutional area’s slopes of the roads are moderately flat to flat, including Constant Avenue, Becker Drive, Iowa Street, Irving Hill Road, and Jayhawk Trail (West Portion). In the residential and commercial area, the slopes of the roads are very steep, including Bob Billings Parkway, Clinton Parkway, Kasold Drive, and Crestline Drive.

Besides those aspects, additional streetlights could be added, particularly along Bob Billing Parkway.
### Table 13: West District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual Crashes Per Mile</th>
<th>Previously Recommended Facility Type by the City of Lawrence</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob Billings Parkway</td>
<td>Kasold Drive to Iowa Street</td>
<td>0.40</td>
<td>None</td>
<td>Shared Bicycle Lane</td>
<td>15,535</td>
<td>None</td>
<td>Steep</td>
</tr>
<tr>
<td>Constant Avenue</td>
<td>Irving Hill Road to West 21st Street</td>
<td>0.00</td>
<td>Shared Lane (West 19th Street to West 21st Street)</td>
<td>Shared Use Path (Irving Hill Road to West 19th Street)</td>
<td>3,938</td>
<td>None</td>
<td>Flat</td>
</tr>
<tr>
<td>Becker Drive</td>
<td>Constant Avenue to West 21st Street</td>
<td>0.32</td>
<td>Shared Lane (Becker Drive Stop #4 to West 21st Street upside)</td>
<td>Shared Bicycle Lane (Becker Drive Stop #4 to West 21st Street downside)</td>
<td>N/A</td>
<td>None</td>
<td>Moderately Flat</td>
</tr>
<tr>
<td>Iowa Street</td>
<td>Bob Billings Parkway to West 23rd Street</td>
<td>1.40</td>
<td>None</td>
<td>Shared Use Path</td>
<td>33,800</td>
<td>None</td>
<td>Modestly Flat</td>
</tr>
<tr>
<td>Clinton Parkway</td>
<td>Kasold Drive to Iowa Street</td>
<td>1.40</td>
<td>None</td>
<td>Shared Use Path</td>
<td>24,520</td>
<td>None</td>
<td>Modestly Steep</td>
</tr>
<tr>
<td>Kasold Drive</td>
<td>Clinton Parkway to Bob Billings Parkway</td>
<td>0.40</td>
<td>Shared Use Path (Clinton Parkway to West 22nd Street)</td>
<td>Shared Use Path</td>
<td>17,070</td>
<td>None</td>
<td>Steep</td>
</tr>
<tr>
<td>Irving Hill Road</td>
<td>West Terminus to Iowa Street</td>
<td>0.00</td>
<td>Bicycle Lane (Engel Road to Naismith Drive)</td>
<td>Shared Use Path (Crestline Drive to Iowa Street), Bicycle route (Iowa Street to Engel Road)</td>
<td>N/A</td>
<td>None</td>
<td>Modestly Flat</td>
</tr>
<tr>
<td>Jayhawk Trail (West Portion)</td>
<td>West 19th Street to West 15th Street</td>
<td>N/A</td>
<td>Shared Use Path</td>
<td>None</td>
<td>N/A</td>
<td>N/A</td>
<td>Flat</td>
</tr>
</tbody>
</table>
NORTH NEIGHBORHOOD DISTRICT

The neighborhood north of KU’s Central and North Districts is largely characterized by older single-family, detached homes that are occupied mostly by students and families. Many of these homes have been converted into smaller apartments for students.

This district is one of the more heavily traveled near campus due to the amount of apartment complexes and homes. This district also provides direct routes (Mississippi Street and Missouri Street) to large parking lots for KU. Mississippi Street is one of the most heavily used streets by bicyclists and pedestrians due to its slope compared to the other entrances to campus. The majority of this district is relatively flat.

Our analysis has focused on 13 corridors within and between this district and Main Campus. Many of the streets that connect this district to campus are frequently used by both bicyclists and pedestrians to commute to campus.

The favorable slope of Mississippi Street gives students access to Jayhawk Boulevard. While this street is used by many bicyclists it is also very heavily used by automobiles due to the large parking lot by Memorial Stadium.

Another important east/west corridor to note is 9th Street, between Iowa Street and Massachusetts Street. This east/west corridor is a highly traveled connection for motorists, bicyclists, and pedestrians. Even though there is already a presence of bike lanes there were 19.55 crashes per mile along this corridor.

This district also encompasses Iowa Street, from 9th Street to 15th Street. This is another one of Lawrence’s busiest arterials. Due to the vehicular usage of the street many bicyclists avoid this street which leads to a much lower amount of crashes.

Other than these two corridors most of the other corridors (Alabama Street, Maine Street, and 11th Street) are used to move bicyclists and pedestrians to Mississippi Street or West Campus Road then up onto Jayhawk Boulevard.
### Table 14: North Neighborhood District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual Crashes Per Mile</th>
<th>Previously Recommended Facility Type by the City of Lawrence</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 11th Street</td>
<td>West Campus Road to Mississippi Street</td>
<td>1.03</td>
<td>Climbing Lane (West Campus Road to Maine), Share Use &amp; Bike Route (Maine Street to Mississippi Street)</td>
<td>None</td>
<td>5,428</td>
<td>Non</td>
<td>Steep</td>
</tr>
<tr>
<td>West Campus Road</td>
<td>West 11th Street to Jayhawk Boulevard</td>
<td>1.43</td>
<td>Climbing Lane</td>
<td>None</td>
<td>10,675</td>
<td>None</td>
<td>Flat</td>
</tr>
<tr>
<td>Crescent Road</td>
<td>Engel Road to Jayhawk Boulevard</td>
<td>1.08</td>
<td>None</td>
<td>Bicycle Route</td>
<td>1264-1336</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
<tr>
<td>9th Street</td>
<td>Iowa Street to Massachusetts Street</td>
<td>3.91</td>
<td>Bicycle Lane (Iowa Street to Indiana Street and Vermont Street to Massachusetts Street)</td>
<td>Bicycle lane (Indiana Street to Vermont Street)</td>
<td>16,755</td>
<td>None</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Illinois (N Section)</td>
<td>West 9th Street to West 11th Street</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
<tr>
<td>Alabama</td>
<td>West 9th Street to West 11th Street</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>Parallel</td>
<td>Flat</td>
</tr>
<tr>
<td>Maine</td>
<td>West 9th Street to West 11th Street</td>
<td>2.73</td>
<td>Bicycle Route</td>
<td>None</td>
<td>N/A</td>
<td>Parallel</td>
<td>Flat</td>
</tr>
<tr>
<td>Harvard Road</td>
<td>Sunset Drive to Kasold Drive</td>
<td>0.36</td>
<td>Bicycle route</td>
<td>1,330</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
<td></td>
</tr>
<tr>
<td>Sunset Drive</td>
<td>West 9th Street to Stratford Road</td>
<td>0.00</td>
<td>Bicycle Route (Cambridge Road to Stratford Road)</td>
<td>Bike route (Harvard Road to Cambridge Road)</td>
<td>N/A</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
<tr>
<td>Stratford Road</td>
<td>Iowa Street to West Campus Road</td>
<td>0.00</td>
<td>Bicycle Route (Emery Road to Sunset Drive)</td>
<td>Bike route (Emery Road to West Campus Road)</td>
<td>1462-2876</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
<tr>
<td>Iowa Street</td>
<td>West 9th Street to Bob Billings Parkway</td>
<td>1.25</td>
<td>None</td>
<td>Shared Use Path</td>
<td>33,800 ~ 34,100</td>
<td>None</td>
<td>Flat</td>
</tr>
<tr>
<td>Engel Road</td>
<td>West 15th Street to University Drive</td>
<td>0.00</td>
<td>None</td>
<td>Bicycle route (West 15th Street to Crescent Road)</td>
<td>N/A</td>
<td>Parallel on Southbound</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Emery Road</td>
<td>West 9th Street to University Drive</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>None</td>
<td>Flat</td>
</tr>
<tr>
<td>University Drive (Parallel to Stratford)</td>
<td>Iowa Street to West Campus Road</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>Parallel on Southbound</td>
<td>Flat</td>
</tr>
</tbody>
</table>
SOUTH NEIGHBORHOOD DISTRICT

KEY CORRIDORS & LAND USE

This area is bound by 23rd Street to the south of campus, Massachusetts Street to the east, the North and Central Districts to the north, and the West District to the west. It encompasses a wide variety of land uses and has a high potential for active bicycling as a transportation option for KU students, faculty and staff members, and the general citizenry of Lawrence. 23rd Street is one of the key commercial corridors of Lawrence and includes amenities such as grocery stores and restaurants.

The portion of Massachusetts Street on the east side of this area is primarily residential. This is similar to the bulk of this district. The vast majority is single family residential with a few apartments and residence halls scattered amongst the single-family homes. Additionally, Lawrence High School is located in the center of this district at the corner of 19th Street and Louisiana Street.

Due to the regularly laid out street grid, and the relative flatness of this area, there are multiple opportunities for bicycle infrastructure improvements. Naismith Road is the primary southern entrance into the heart of the KU Campus and would provide a natural starting place for corridor improvements. While 23rd Street is one of the busiest corridors in Lawrence, the amount of traffic and limited right of way may hinder significant bicycle infrastructure improvements there in the immediate future. However, the impending completion of the South Lawrence Trafficway may provide traffic relief to 23rd Street and may provide opportunities for bicycle infrastructure improvements long term.

Among other streets, 19th Street and Louisiana Street both offer significant opportunities for improved bicycle infrastructure, signage, and access. All of these routes also compliment existing bus routes and provide opportunities for multimodal connections.
Table 15: South Neighborhood District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual Crashes Per Mile</th>
<th>Previously Recommended Facility Type by the City of Lawrence</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 19th Street</td>
<td>Iowa Street to Massachusetts Street</td>
<td>2.12</td>
<td>Bike Lane (Iowa Street to Naismith Drive and Alabama Street to Massachusetts Street)</td>
<td>Bike Lane (Naismith Drive to Alabama Street)</td>
<td>10,248</td>
<td>None</td>
<td>Moderately Flat</td>
</tr>
<tr>
<td>Mississippi Street</td>
<td>Sunflower Road to West 19th Street</td>
<td>1.11</td>
<td>Shared Lane (Sunflower Road to Memorial Drive), Proposed Bicycle lane (Memorial Drive to West 11th Street)</td>
<td>Bike Route</td>
<td>N/A</td>
<td>Parallel on</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Louisiana (South Section)</td>
<td>Sunnyside Avenue to West 23rd Street</td>
<td>0.71</td>
<td>None</td>
<td>Bike Route</td>
<td>11,060</td>
<td>Parallel on</td>
<td>Flat</td>
</tr>
<tr>
<td>Indiana (South Section)</td>
<td>Sunnyside Avenue to West 19th Street</td>
<td>0.00</td>
<td>None</td>
<td>Bike Route (Sunflower Road to West 18th Street)</td>
<td>915</td>
<td>Parallel on</td>
<td>Flat</td>
</tr>
<tr>
<td>Illinois (South Section)</td>
<td>Sunnyside Avenue to West 19th Street</td>
<td>0.57</td>
<td>Bike Route</td>
<td>None</td>
<td>1,666</td>
<td>Parallel on</td>
<td>Flat</td>
</tr>
<tr>
<td>Missouri</td>
<td>West 9th to West 11th Street</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>N/A</td>
<td>Parallel</td>
<td>Flat</td>
</tr>
<tr>
<td>23rd Street</td>
<td>Iowa Street to Massachusetts Street</td>
<td>2.71</td>
<td>Shared Use Path</td>
<td>None</td>
<td>29,600</td>
<td>None</td>
<td>Moderately Steep</td>
</tr>
<tr>
<td>Naismith Drive</td>
<td>West 19th to West 23rd Street</td>
<td>1.20</td>
<td>Bike Lane (19th Street to Crescent Avenue)</td>
<td>Bike Route (W 23rd. Street to 19th Street)</td>
<td>7,995</td>
<td>None</td>
<td>Flat</td>
</tr>
<tr>
<td>West 22nd Street Terrace</td>
<td>Ousdahl Road to Carolina Street</td>
<td>0.00</td>
<td>None</td>
<td>None</td>
<td>525</td>
<td>Parallel</td>
<td>Flat</td>
</tr>
<tr>
<td>West 21st Street</td>
<td>Constant Avenue to Massachusetts Street</td>
<td>0.43</td>
<td>Bike Lane (Iowa Street to Massachusetts Street)</td>
<td>Bike Route (Iowa Street to Massachusetts Street &amp; Shared Use (Iowa Street to Constant Avenue)</td>
<td>1,100</td>
<td>Parallel on</td>
<td>Flat</td>
</tr>
<tr>
<td>Ousdahl Road</td>
<td>West 19th to West 23rd Street</td>
<td>0.00</td>
<td>Bike Route</td>
<td>None</td>
<td>4,370</td>
<td>Parallel on</td>
<td>Flat</td>
</tr>
</tbody>
</table>
The district east of KU is characterized by single-detached homes, fraternity houses, small apartment complexes, and downtown Lawrence. Many of the single-family, detached homes between Massachusetts Street and campus have been converted into rental units that house KU students. The makeup of the neighborhood between downtown Lawrence and KU is composed primarily of students. Due to the neighborhood’s proximity to campus, many of the students choose to walk or bicycle to class. The main deterrent to more bicycle and pedestrian transportation is the slope on the east side of campus. This slope makes the walk or ride to class strenuous.

Our analysis has focused on seven corridors within and between this neighborhood and Main Campus. Several of the streets that connect the East District to campus are far too steep for the average rider. The 13th Street and 12th Street corridors are steep and likely dissuade casual bicyclers from accessing campus. The other two east-west corridors analyzed include 17th Street and 18th Street. These re flat or moderately flat, but do not get the rider to the summit of campus on Jayhawk Boulevard.
Table 16: East Neighborhood District Corridor Analysis

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Segment</th>
<th>Annual</th>
<th>Previously Recommended Facility Type by the City of Lawrence</th>
<th>Existing Bicycle Infrastructure</th>
<th>ADT</th>
<th>Parking</th>
<th>Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>West 13th Street</td>
<td>Oread Avenue to Massachusets Street</td>
<td>1.62</td>
<td>None</td>
<td>No</td>
<td>2,385</td>
<td>Parallel on SB</td>
<td>Steep</td>
</tr>
<tr>
<td></td>
<td>West 23rd Street to West 9th Street</td>
<td>3.18</td>
<td>Shared Lane Marking (West 9th Street to West 11th Street)</td>
<td>Bike route (West 11th Street to West 23rd Street)</td>
<td>14,170</td>
<td>Parallel &amp; Flat</td>
<td>Flat</td>
</tr>
<tr>
<td>Louisiana (N Section)</td>
<td>West 14th Street to West 9th Street</td>
<td>1.18</td>
<td>Bike Lane</td>
<td>Bike Lane</td>
<td>N/A</td>
<td>Parallel on SB</td>
<td>Moderately Flat</td>
</tr>
<tr>
<td>Indiana (N Section)</td>
<td>West 12th Street to West 9th Street</td>
<td>1.05</td>
<td>Bike Route (West 11th Street to West 12th Street)</td>
<td>No</td>
<td>N/A</td>
<td>Parallel on SB</td>
<td>Steep</td>
</tr>
<tr>
<td>West 12th Street</td>
<td>Indiana Street to Vermont Street</td>
<td>0.69</td>
<td>None</td>
<td>Bike route (Indiana Street to Louisiana Street)</td>
<td>5,651</td>
<td>Parallel on SB</td>
<td>Steep</td>
</tr>
<tr>
<td>West 17th Street</td>
<td>Alabama Street to Massachusets Street</td>
<td>0.33</td>
<td>None</td>
<td>Bike Route (Maine Street to Naismith Drive)</td>
<td>1666-1958</td>
<td>Parallel on SB</td>
<td>Flat</td>
</tr>
<tr>
<td>West 18th Street</td>
<td>Naismith Drive to Vermont Street</td>
<td>0.00</td>
<td>Bike Route (Maine Street to Naismith Drive)</td>
<td>Bike Route (Maine Street to Indiana Street)</td>
<td>N/A</td>
<td>Parallel on SB</td>
<td>Flat</td>
</tr>
</tbody>
</table>
The chart to the right shows the complete set of responses from the Wescoe Hall public engagement activity.

The following page contains the complete set of questions asked in the March 2016 survey.

<table>
<thead>
<tr>
<th>What keeps you from biking on campus?</th>
<th>What would motivate you to bike on campus?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>Count</td>
</tr>
<tr>
<td>No bike</td>
<td>9</td>
</tr>
<tr>
<td>I take the bus</td>
<td>4</td>
</tr>
<tr>
<td>I don’t live in Lawrence</td>
<td>4</td>
</tr>
<tr>
<td>I wear nice Clothing</td>
<td>3</td>
</tr>
<tr>
<td>The hills</td>
<td>3</td>
</tr>
<tr>
<td>My bike has been stolen</td>
<td>3</td>
</tr>
<tr>
<td>Careless Pedestrians</td>
<td>2</td>
</tr>
<tr>
<td>I prefer to walk</td>
<td>2</td>
</tr>
<tr>
<td>Bad road conditions</td>
<td>2</td>
</tr>
<tr>
<td>Bikes are expensive</td>
<td>2</td>
</tr>
<tr>
<td>I don’t know the routes</td>
<td>1</td>
</tr>
<tr>
<td>Lazy</td>
<td>1</td>
</tr>
<tr>
<td>Lack of bike lanes</td>
<td>1</td>
</tr>
</tbody>
</table>
### SURVEY QUESTIONS

1. How often do you ride your bike to the KU campus?
   - Daily 65%
   - Weekly 6%
   - Monthly 0%
   - Yearly 6%
   - Never 24%

2. What areas of Lawrence are you currently biking to the KU campus from?
   - North 36%
   - East 7%
   - South 21%
   - West 14%
   - Campus Housing 21%

3. Which of the following bike amenities, if added to the KU campus, would increase your frequency of biking to campus?
   - Additional bike parking 38%
   - Covered bike parking 69%
   - Bike lockers 31%
   - Showers 15%
   - Staffed bike maintenance 62%
   - Self-service bike repair station 69%
   - Other 31%
   - Bike rails, bike lanes, shared bike program 0%

4. How easy is it to find bike parking on the KU campus?
   - Very difficult 6%
   - Slightly difficult 6%
   - Slightly easy 56%
   - Very easy 30%
   - Not Sure 6%

5. How often do you use the bike racks on the KU buses?
   - 1 time a year 0%
   - 1 time a month 6%
   - 1 time a week 12%
   - Multiple times a week 19%
   - Never 44%
   - What’s this? 19%

6. How supportive would you be of increasing the student activity fee for bike programs and facilities?
   - Very supportive 50%
   - Somewhat supportive 19%
   - Somewhat unsupportive 13%
   - Very unsupportive 19%

7. Are you familiar with KU’s current biking education programs?
   - Yes 18%
   - No 82%

8. How comfortable are you with biking on the KU campus?
   - Very comfortable 12%
   - Somewhat comfortable 65%
   - Somewhat uncomfortable 18%
   - Very uncomfortable 6%
APPENDIX C - FACILITY TYPES

The city of Lawrence, Kansas has numerous bicycle and pedestrian facilities, including sidewalks, on-street bicycle routes, and off-street multi-use paths. Each facility type has certain characteristics that dictate how that facility is used and the level of safety that is perceived by their users. Pedestrians and bicyclists rely on these characteristics as well as the connectivity between their origins and destinations to decide whether to bicycle/walk instead of using their cars, if available. This section describes typical bicycle and pedestrian facilities.

There are a range of bicycle facilities that could be implemented across campus. These facilities commonly break down into two categories: on-street and off-street.

**ON-STREET FACILITIES**

On-street facilities share the roadway with vehicular traffic, but vary in their level of buffering depending on the facility.

**SHARED STREETS (LANES)**

Bicyclists in Lawrence, Kansas are permitted to ride on many of the roadways and share the space with automobiles. Shared streets, along with markings, help remind motorists and bicyclists of the need to share the space. Shared streets are most effective when targeting specific corridors while using signage to alert drivers of their presence.

These shared streets, or “sharrows” encourage bicyclists to use streets that have low traffic volumes and low speeds. This facility type may also help direct cyclists to designated routes that have connections to other bicycle friendly streets.

Where it is best used:
- Local and collector streets
- Low traffic volume
- Vehicle speeds of less than 25 mph
- Streets with on street parking

Shared streets allow for bicyclists and motorists to operate in the same right-of-way. The typical accommodation for bicyclists are either sharrows or bicycle route signage placed on the side of the roadway. There are numerous examples of both sharrows and bicycle route signs in Lawrence, Kansas.

**BICYCLE LANES**

Bicycle lanes accommodate bicyclists by using a painted lane and take up a portion of the roadway. While bicyclists use bicycle lanes they are subject to normal rules of the road. Buffers can also be added with additional pavement markings to increase visibility and safety of all users of the roadway.

These facilities are marked by striping, signage, and pavement markings for the preferential or exclusive use of bicycles. Bicycle lanes are normally four to six feet wide. At a minimum, bicycle lane markings include a solid white line and periodically placed bicycle symbols that indicate the direction of the bicyclist. Some lanes are even painted green so as to be further distinguish the lane from the automobile area. This facility type has been shown to increase bicyclist comfort and confidence on busy streets.

Where it is best used:
- Medium to high traffic volume
- Regular truck traffic
- Streets with wide existing lanes
- Vehicular speeds above 25 mph
CYCLE TRACKS
Cycle tracks are similar to bicycle lanes. The buffer between traffic is physically separated by structures rather than pavement markings. While this facility type is more costly, it offers a higher amount of comfort and safety to bicyclists. There are currently no cycle tracks in Lawrence.

Where it is best used:
• Areas of high traffic volume
• Areas with regular truck traffic
• Streets with wide existing lanes
• Vehicular speeds above 25 mph

OFF-STREET FACILITIES
Off-street facilities primarily include multiple types of users and are buffered by open space, barriers, and/or physical separation.

SIDEWALKS
Sidewalks are paved walkways designed to accommodate non-motorized traffic. While younger bicyclists may use sidewalks, this type of facility is best fit for pedestrians.

MULTI-USE PATHS
Multi-use paths, or shared-use paths, accommodate only non-motorized users. These facilities most often connect neighborhoods through exclusive right-of-way apart from streets, and often run along waterways, greenways, parks, and reclaimed railways. In general, multi-use paths are typically 10 feet wide, which makes them much larger than normal sidewalks and more accommodating to different uses.

There are several examples of these paths in Lawrence including the Burroughs Creek Trail which runs through East Lawrence and follows an abandoned rail line and water way.

Where it is best used:
• Adjacent to minimal access arterial streets
• Waterways, railroad corridors, parks
• Adjacent to high traffic volume or truck volume
• Adjacent to roadways with higher vehicle speeds

Source: NACTO

Source: Chris Treadway
SIDEPATHS
Sidepaths are multi-use paths that run parallel to a street, often in the same right-of-way, and in place of a sidewalk. Sidepaths are typically 10 feet wide, and can serve both bicyclists and pedestrians. Sidepaths are typically separated from the street by wide vegetation buffers, or in areas with constrained right-of-way, by a physical barrier.

BICYCLE PARKING
Bicycle racks consist of sturdy structures where bicyclists can securely store their bicycles. These facilities are generally not covered which exposes the bicycle to the elements. These storage facilities are often the location of theft due to their open and exposed nature. Many cities attempt to improve bicycle racks by making them match the identity of the community or by using as public art. An example of artistic bike racks can be found on Jayhawk Boulevard outside of Spooner Hall where the rack is made to look like the frame of a bike.

Common Destinations:
- Schools
- Libraries
- Shopping Areas

HALF H BICYCLE PARKING
One of the most common types of bicycle racks used on campus is the affordable “Half H” design. This design features racks shaped in the form of the bottom half of an “H” and secured in a concrete bed with the ability to hold two bicycles per rack.

While this may be one of the most economical racks it is also one of the least aesthetically pleasing bicycle storage facilities. Communities should focus on blending all bicycle facilities into the culture and art of their surroundings and the Half-H bicycle rack does a poor job in this effort.

Where It Is Best Used:
- Large destinations where the bicyclist will spend a large part of their day
- Places like universities, office parks, and transit stations

BICYCLE CORRALS
The “Bicycle Parking Guidelines (2nd Edition (2010))” published by the Association of Pedestrian and Bicycle Professionals states that an alternative method for providing greater quantities of short term bicycle parking is to consolidate the racks and locate them in the traditional auto, on-street parking lane, along the curb.

Where it is best used:
- Commercial corridors
- Where space is crowded
- Areas with high bicycle traffic

COVERED BICYCLE PARKING
While more expensive than bicycle racks, covered bicycle parking greatly increases the safety and comfort of the bicycle and rider. Covered parking structures allow the bicycle to be stored for a short term out of the elements and in a place that can be more closely monitored for theft.

Source: Park A Bike

Source: The Wash Cycle
BICYCLE AND PEDESTRIAN PLAN REVIEW

FOR KU BICYCLE ADVISORY COMMITTEE

LAUREN REIMAN
CAITLIN ZIBERS
GALA KORNIYENKO

8 DECEMBER 2015
University Bicycle and Pedestrian Plan Review

Compiled For: KU Bicycle Advisory Committee
Compiled By: Lauren Reimman, Urban Planning Graduate Student
Caitlin Zibers, Urban Planning Graduate Student
Gala Korniyenko, Urban Planning Graduate Student

The following is a list of the plans and reports that were examined. The analysis is condensed into one-to-two page documents that allow committee members a brief overview of the methodology of the plan, goals and objectives, the public involvement process, and any other relevant notes.

- Colorado State University
- James Madison University
- New York University
- Ohio State University
- University of Arizona
- University of California, Berkeley
- University of Illinois
- University of Kentucky
- University of Maryland
- University of New Mexico
- University of North Carolina at Chapel Hill
- University of North Carolina at Greensboro
- University of Vermont
- Washington State University

Based on the review of the fifteen documents, the team has concluded that the best plans/reports are the following:

- James Madison University (Methodology)
- New York University (Compilation of case studies)
- University of Kentucky (Implementation Matrix)
- University of Arizona (Methodology, compiled best practices)
- Ohio State University (Classification of riders)

NEXT STEPS:

KU Bicycle Advisory Committee: Based on this review and the following summaries, we hope that the committee can clearly articulate their goals that will then be used by the UBPL Transportation Implementation course for the development of KU’s Bicycle and Pedestrian Plan.

Student Collaboration: We foresee our next step to be a GAP analysis of existing plans, policies, and documents of the University of Kansas and the local Lawrence community. We see this as a valuable foundation for the UBPL Transportation Implementation course. Additionally, if time allows before the start of the semester, we will begin a compilation of existing data including (Bike and pedestrian counts by location, crash data, etc.)
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>Colorado State University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>Bicycle Master Plan</td>
</tr>
</tbody>
</table>
| Methodology: | Gathering Data:  
→ Online interactive map "Where I'd like to ride"  
→ Hand-Drawn Routes from WikiMap  
→ Surveys: Student Housing and a Parking and Transportation Master Plan Survey  
→ Analysis of existing bicycle environment (bicycle network map)  
→ Vehicular Travel Routes and Patterns (map)  
→ Campus Bicycle Rack Inventory  
→ Parking Occupancy and Policies |
| Outputs: | Bicycle Parking Best Practices, Bicycle Parking Needs, Bicycle Parking per Building Typology (p.43), Bicycle count implementation (map page 50), Facility typology toolbox, Project prioritization, and Funding strategies and sources |
| Goals, Objectives, & Actions: | Purpose: To help the University increase bicycling on campus as a way to enhance campus sustainability and reduce demand for automobile travel and parking.  
Goals: Improve Sustainability; Attain Platinum Bicycle-Friendly Designation  
Actions/Programs:  
→ Ram Guards program to control traffic at highly-congested locations to address wrong-way bicycle riding  
→ RamBassadors program to perform educational outreach  
→ Bicycle Registration, The Fort Collins Bike Library (to check out a bike from their any of their five locations and return them at any of the six drop-off locations between April and mid-December)  
→ Back on the Bike Program  
→ Traffic Law Enforcement  
→ Fix-It stations (a number of self-service bicycle fix-it stations on campus that include air pumps and an assortment of tools to help bicyclists repair flats and complete basic tune-ups)  
→ ReCycled Cycles, a full-service bicycle store and service; a separation of bicycles and pedestrians to create pedestrian- and bicycle-only corridors, dismount zone (p.23).  
Bicycle Network Recommendations: Reduce Conflicts, Increase Bicyclist Comfort, Provide more Connections, Improve Campus Access. |
| Public Involvement Process: | Bicycle Pedestrian Education Coalition, A steering committee of students, faculty, and staff, community members, Two public open houses, The Bicycle Education and Enforcement Program;  
Public feedback, combined with field observations about existing barriers and challenges (lack of cross-campus connections) |
| Other Notes: | None |
## University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>James Madison University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>Campus Bicycle and Pedestrian Plan</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Data Collection:</td>
</tr>
<tr>
<td></td>
<td>→ Assessment of Existing Pedestrian and Bicycle Facilities</td>
</tr>
<tr>
<td></td>
<td>→ Campus tours to observe and photo-document existing facilities, peak and off-peak usage, and system gaps and deficiencies</td>
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<tr>
<td></td>
<td>→ Pedestrian, bicycle, and vehicle counts and accident data</td>
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<td></td>
<td>→ User-provided path preference data provided via the JMU MOVES smartphone application</td>
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<tr>
<td></td>
<td>→ Wayfinding, Accessibility, Crosswalk Audit (p.16)</td>
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<tr>
<td></td>
<td>→ A campus-wide inventory of existing street lighting and callboxes</td>
</tr>
<tr>
<td></td>
<td>→ Surveys: Active Transportation Survey, Bicycle and Pedestrian Transportation Survey, and Campus Demographics</td>
</tr>
<tr>
<td></td>
<td>→ Major Circulation Patterns</td>
</tr>
<tr>
<td></td>
<td>→ Roadway Functional Classification [map page 27]</td>
</tr>
<tr>
<td></td>
<td>→ Traffic volume and congestion</td>
</tr>
<tr>
<td></td>
<td>→ Bicycle and pedestrian counts</td>
</tr>
<tr>
<td></td>
<td>→ Safety Data (public crash data, city crash data, bicycle and pedestrian collisions [maps])</td>
</tr>
<tr>
<td></td>
<td>→ Campus population growth projections</td>
</tr>
<tr>
<td>Goals, Objectives, &amp; Actions:</td>
<td>Stated Goals &amp; Objectives:</td>
</tr>
<tr>
<td></td>
<td>→ Goal 1: Promote safety, accessibility, and convenience for bicyclists, pedestrians, and users of mobility devices</td>
</tr>
<tr>
<td></td>
<td>* Identify and study intersections with safety and accessibility concerns</td>
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<tr>
<td></td>
<td>* Retrofit existing and coordinate future transit facilities with supportive amenities for bicycle, pedestrian, and users of mobility devices</td>
</tr>
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<td></td>
<td>* Improve bicyclist and pedestrian safety through increased enforcement of the &quot;rules-of-the-road&quot;</td>
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<tr>
<td></td>
<td>→ Goal 2: Establish connections to the City of Harrisonburg's bicycle and pedestrian facilities</td>
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<td></td>
<td>* Review and incorporate recommendations from the City of Harrisonburg Bicycle and Pedestrian Plan</td>
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<td></td>
<td>* Establish on-going dialog with the City's Bicycle and Pedestrian Subcommittee</td>
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<td></td>
<td>* Coordinate with Harrisonburg-Rockingham Metropolitan Planning Organization (HRMPO) bicycle and pedestrian planning process</td>
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<tr>
<td></td>
<td>→ Goal 3: Enhance the comprehensive system of bicycle and pedestrian facilities on campus</td>
</tr>
<tr>
<td></td>
<td>* Identify and connect gaps between existing facilities</td>
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<td></td>
<td>* Engage the campus population to provide input on improvements</td>
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<tr>
<td></td>
<td>* Conduct a transportation survey of the campus population</td>
</tr>
<tr>
<td></td>
<td>* Prioritize improvement projects for existing facilities and amenities, as well as future construction</td>
</tr>
<tr>
<td></td>
<td>* Seek Silver-level Bicycle Friendly University status</td>
</tr>
<tr>
<td></td>
<td>→ Goal 4: Develop strategies for education and encouragement programs</td>
</tr>
<tr>
<td></td>
<td>* Identify peer University best practices</td>
</tr>
<tr>
<td></td>
<td>* Coordinate with the city and other state government agencies on community and regional bicycle and pedestrian programs</td>
</tr>
<tr>
<td></td>
<td>* Use marketing strategies to promote the culture of bicycling among the campus population</td>
</tr>
</tbody>
</table>
| Public Involvement Process | Public Meetings, input of the Harrisonburg community, the Shenandoah Bicycle Coalition, a local bicycle shop.  

Outreach Activities: campus events, JMUC3VES smartphone application, campus surveys  

Appendices include topics discussed during outreach program "Open House Meeting" (p.84) Misc. suggestions for new facilities, amenities, and educational programs that JMU may offer in the future. (p.86), results of the surveys with graphs and answers; Summary of Qualitative Feedback—Mapping Questions |
| Other Notes: | Recommended Project List with feasibility and cost estimate (p.49)  

Existing conditions and Photo simulation (pages 71-75)  

Appendices include surveys results and pedestrian facility design guidelines (p.154) and bicycle facility design guidelines (p.164)  

Appendix a – how to obtain related documents and web resources (p.155) |
# University Bicycle and Pedestrian Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>New York University</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title of Plan:</strong></td>
<td>Bicycling at New York University Report (recommendation on the development of a bicycle master plan)</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>Abandoned Bicycle Recycling Program, infrastructure inventory (indoor and outdoor parking), Bicycling Survey, Street infrastructure (bicycle lanes), traffic volume and speed controls, non-cyclists survey (factors influencing their decision not to cycle). Case studies.</td>
</tr>
<tr>
<td><strong>Goals, Objectives, &amp; Actions:</strong></td>
<td>The document serves as the foundation for NYU’s bicycle plan. This document provides a framework for the future plan. Advice to develop: an abandoned bicycle removal policy/program; bicycle theft prevention education; bicycle theft recovery measure; community growth initiatives; bike sharing ‘library’ program</td>
</tr>
<tr>
<td><strong>Public Involvement Process:</strong></td>
<td>Local non-profit Time’s Up! Environmental Group</td>
</tr>
<tr>
<td><strong>Other Notes:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>The Ohio State University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>Campus bikeways Subdistrict Plan</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Needs Analysis (access to the campus from adjacent neighborhoods, secure parking, high traffic volume of internal streets)</td>
</tr>
<tr>
<td></td>
<td>Categorization of bicyclists</td>
</tr>
<tr>
<td></td>
<td>Ridership patterns</td>
</tr>
<tr>
<td></td>
<td>Analysis of existing conditions and amenities</td>
</tr>
<tr>
<td></td>
<td>Proposed Bikeway System</td>
</tr>
<tr>
<td></td>
<td>Bikeways Plan</td>
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<td></td>
<td>Design Standards</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Goals, Objectives, &amp; Actions:</th>
<th>Goals and Policies:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mobility Choices: provide mobility choices for students, faculty, employees, and visitors, from private automobiles to transit, walking, and bicycling.</td>
</tr>
<tr>
<td></td>
<td>Innovation: The OSU, as a great center of innovation, should play a leadership role in promoting alternative transportation systems in the Columbus region.</td>
</tr>
<tr>
<td></td>
<td>Health and Wellness: An active campus is a healthy campus. OSU has a commitment to excellence in the fields of sports and health, and to the wellness of its faculty, staff and students. By promoting bicycling, the University encourages a healthy active lifestyle, integrated into daily life.</td>
</tr>
<tr>
<td></td>
<td>Safety: Enhancing safety for the entire Ohio State campus population is a primary goal. This plan will endeavor to enhance the safety of bicyclists, pedestrians and vehicles.</td>
</tr>
<tr>
<td></td>
<td>Routine Accommodation: Bicycle facilities, including bicycle parking, should be routinely considered and included in all capital and maintenance projects to provide &quot;complete streets&quot;, as feasible.</td>
</tr>
<tr>
<td></td>
<td>Parking Demand Reduction: As close-in automobile parking becomes scarce and more expensive to provide, alternative forms of transit becomes more important. The University should encourage the use of other modes of travel, including cycling, as a parking demand reduction strategy. Incentives for use of alternative modes of transportation should be provided.</td>
</tr>
<tr>
<td></td>
<td>Protecting the Environment: Encouraging bicycling on campus reduces automobile usage and its harmful effects on the environment.</td>
</tr>
</tbody>
</table>

| Public Involvement Process: | Not stated. |

<table>
<thead>
<tr>
<th>Other Notes:</th>
<th>Addresses possible conflicts between pedestrians and bike users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plan provides a number of on-line resources and standard tests that are exceptionally helpful for OSU and city staff involved in the planning, design and implementation of non-motorized transportation (p.26).</td>
</tr>
<tr>
<td></td>
<td>Plan includes Potential policies related to Maintenance of bike lanes (p.29)</td>
</tr>
</tbody>
</table>
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>University of Arizona — UAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>University of Arizona Area Bicycle and Pedestrian Plan</td>
</tr>
</tbody>
</table>

## Methodology:
- Review of existing plans and policies (university, city, regional, and state)
- Inventory of existing conditions: infrastructure, end-of-trip facilities (parking inventory), multi-modal connections, collision and safety analysis (crash and collision data from ADOT and theft data provided by the University of Arizona and Police Department), and education and encouragement programs
- Needs analysis
- Best practices
- Implementation
- Recommended improvements, prioritization, and cost estimates

## Goals, Objectives, & Actions:
Objectives to improve conditions:
- Reduce collision risk; identify potential conflict points on campus and create solutions to better manage bicycle and pedestrian flow.
- Improve existing infrastructure; identify strategies to develop and enhance the existing campus and area bicycle and pedestrian infrastructure with a focus on access, connectivity, and safety.
- Develop design standards; define bikeway and pedestrian infrastructure standards to guide future development.
- Increase bicycle and pedestrian mode share and safety; guide development of both marketing and education programs to increase mode share and safety.
- Implementation: Outline implementation strategies to help the University of Arizona, City of Tucson, and Pima Association of Governments carry out the specific recommended improvements and programs.

Implementation/Actions:
- Campus bicycle and pedestrian program coordinator
- Campus bicycle and pedestrian advisory committee
- Automated bicycle and pedestrian counters

## Public Involvement Process:
Public involvement was incorporated in the “Needs Analysis” process including:
- Project team bicycle and walking audits/field tours
- Open house public workshop centered on improvement and preferred facilities
- Online survey to capture mobility data in study area
- Bicycle and pedestrian counts (taken from MPD’s annual bicycle and pedestrian counting through volunteers)
- Gap Analysis (connection gaps, linear gaps, and corridor gaps)

## Other Notes:
This plan was created in conjunction with Pima Association of Governments (the local MPD) providing more resources and a comprehensive approach. The public involvement/needs analysis is impressive. UAA may be a good contact point for methodology.
This plan provides a good overview of best practices for a university campus. They also provide design guidelines.
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>The University of California, Berkeley</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>Campus Bicycle Plan</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Analysis of Setting, bike use, UCB Student Housing and Transportation Survey, Faculty and Staff Housing and Transportation Survey, Peak Hour Campus Entry Bicycle Volumes (p.24, p.25 - map), Bicyclist Collisions, Security-Thefts and Recoveries, Enforcement-Citations</td>
</tr>
</tbody>
</table>

Scope: focuses on UCB's 1.79-acre central campus. Other UCB properties are not included in the scope of this plan because of limited resources. Implementation: bicycle licensing and bike racks on campus transit, managing secure bicycle parking facilities, and enforcing bicycle riding and parking rules.

Actions: Existing On-campus Bicycle Circulation and proposed, bicycles and transit, bicycle parking (existing and proposed), Bicycle Programs, Educational, Outreach (p.51), incentives programs, enforcement programs, Design guidelines, BICYCLE STAIR RAMPS (p.65 with pictures and design)

Implementation: campus commitment, project and program selection criteria, project and program priorities (cost, funding page 72), approval process. Implementation responsibilities fall to two generalized groups:

- Campus Administration (Parking and Transportation Department and the UC Police Department) - oversee outreach, marketing, education and enforcement + grant funding
- Facilities Services (Physical and Environmental Services, Capital Projects, and Physical Plant-Campus Services) - oversee implementation of the Capital Projects Checklist

<table>
<thead>
<tr>
<th>Goals, Objectives, &amp; Actions:</th>
<th>The main goal is to improve bicycle access and safety for students, faculty, staff, and visitors and to increase the number of commuters choosing to bicycle to and from campus. The goal of the plan is to complete the projects and programs within the next ten years. Implementation will improve bicycling access and will help the campus achieve an increase in bicycling commuters.</th>
</tr>
</thead>
</table>
| Goals:                        | Increase Bicycling  
|                               | Integrate Bicycling  
|                               | Implement Plan |
| Objectives:                   | Bicycle-Related Infrastructure (bikeway network, New Development and Construction)  
|                               | Develop and Improve Planning and Programs (Interagency Coordination, Education and Incentive Programs, Bicycle Enforcement and Theft Prevention)  
|                               | Future Issues (updates to the Campus Bicycle Plan every five years, Address and evaluate) |
### Public Involvement Process

Advocacy leadership through leadership committee including: Campus Committee for the Reduction of Architectural Barriers, Berkeley Bicycle Subcommittee Members, Committee on Academic Planning and Resource Allocation, Chancellor’s Advisory Committee on Sustainability, Chancellor’s Parking & Transportation Oversight Committee, Bicycle-Friendly Berkeley Coalition, Bicycle & Pedestrian Planner, City of Berkeley, UCB Graduate Assembly

### Other Notes

Referenced to the Landscape Master Plan, the 2020 Long Range Development Plan, and reflective of the UC Policy on Green Building Design, Clean Energy Standards, and Sustainable Transportation Practices (page 9).

**Funding Agency:** Alameda County Transportation Improvement Authority. Funded through Measure B, Bicycle and Pedestrian Countywide Discretionary Funds, Alameda County Transportation Improvement Authority provided grant funds in support of the plan.

Despite the challenges of topography on its hillside site, UC Berkeley aims to be a model bicycle-friendly urban campus.

Appendixes include ON-CAMPUS BIKEWAYS AND CITY-CAMPUS INTERFACE, Parking inventory, campus outreach, capital project checklist, a ten-year implementation table
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>University of Illinois</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>Campus Bicycle Network Master Plan</td>
</tr>
<tr>
<td>Methodology:</td>
<td>The preliminary existing conditions report was the 2007 Multi-Modal Study. That study identified a number of issues about the campus bike paths and held 2 public input sessions.</td>
</tr>
<tr>
<td></td>
<td>A draft plan was developed in 2009 by TDM (transportation demand management) which incorporated the related plans from both cities and the principles laid out in the Multi-Modal Study.</td>
</tr>
<tr>
<td></td>
<td>The CATS (campus area transportation study) Technical Committee created a CATS bike Plan working group to finalize the Bicycle Network for the University District. There was a public input session in October 2010 during Sustainability Week.</td>
</tr>
<tr>
<td></td>
<td>In 2011 and 2012, a number of items were addressed concurrently: the map was refined to include conceptual layouts for University-owned segments, T.Y. Lin was hired by MTD (Champaign-Urbana Mass Transit District) to evaluate bus-bike safety needs, and CULATS (Champaign-Urbana Urbanized Area Transportation Study) began the University District Traffic Circulation Study.</td>
</tr>
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<td></td>
<td>This document incorporates the results of the previous four steps as the 2014 Campus Bike Plan, as well as a public input period during spring 2013.</td>
</tr>
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<table>
<thead>
<tr>
<th>Goals, Objectives, &amp; Actions:</th>
<th>Stated Goals (Plan also lists actions for each goal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increase safety for all campus users, including pedestrians, bicyclists, transit riders, and motorists</td>
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<tr>
<td></td>
<td>Increase sustainability of campus transportation</td>
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<tr>
<td></td>
<td>Improve mobility and convenience for cyclists on campus</td>
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<tr>
<td></td>
<td>Identify funding needs and prioritize funding allocations for improvement of bicycle facilities, services, and programs on campus</td>
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<td></td>
<td>Improve the university's standing as a national leader in bicycle friendliness</td>
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</table>

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<thead>
<tr>
<th>Public Involvement Process:</th>
<th>Compilation of public input from efforts/plans between the 1999 Campus Area Transportation Study to the 2013 University District Traffic Circulation Study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In addition to historical resources there was a four-week public comment period for this plan in March 2013, during which time anyone could review and submit feedback on the plan through the online form, or in person at a number of hosted events during the four-week period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Notes:</th>
<th>Prepared by Facilities &amp; Services, Engineering and Transportation Services, Transportation Demand Management (Primary focus of plan on infrastructure improvements)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Included definitions, terms and acronyms</td>
</tr>
<tr>
<td></td>
<td>Included executive summary (total length was 247 pages)</td>
</tr>
</tbody>
</table>
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th><strong>University:</strong></th>
<th>University of Kentucky</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title of Plan:</strong></td>
<td>University of Kentucky Campus Bicycle Plan</td>
</tr>
</tbody>
</table>
| **Methodology:** | - Reviewed previous campus plans and geographic information systems data  
- Reviewed City plans relevant to the effort including road design projects and trails and greenways plans and geographic information systems data  
- Conducted fieldwork on the UK campus including on-bike field surveys  
- Held public forums to present plan progress and gathered input from the UK community  
- Conducted an online survey to learn about UK community members' commuting patterns |
| **Goals, Objectives, & Actions:** | Significantly increase bicycling on campus as an alternative to automobile travel |
| **Public Involvement Process:** | Public forums for input on plan progress and online survey to gather commuting patterns |
| **Other Notes:** | Has a 5 year work plan which included:  
- Recommendation  
- Timeline  
- Cost  
- Group/Agency Responsible  
Included detailed action steps and objectives in the work plans |
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University</th>
<th>University of Maryland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan</td>
<td>University of Maryland - College Park Facilities Master Plan 2011-2030 Update</td>
</tr>
<tr>
<td>Methodology</td>
<td>Background research: The project team reviewed plans and studies such as the Campus Bicycle Study, University of Maryland 2001-2020 Facilities Master Plan, and the Campus Sustainability Report. In addition, the project team reviewed results from the 2010 Campus Transportation Survey. Field analysis: The project team conducted field work in late 2010/early 2011 to analyze existing bicycling and road conditions and to develop recommendations for physical improvements on and off campus. Fieldwork and observations were conducted at peak travel times and also at high traffic events on campus. Transportation Subcommittee: The project team worked closely with the FMP Transportation Subcommittee in fall, 2010 and spring, 2011. The Transportation Subcommittee was composed of a diverse group of stakeholders, including students, faculty, staff, and stakeholders from outside of the University, such as the City of College Park and the Maryland-National Capital Park and Planning Commission (M-NCPPC).</td>
</tr>
</tbody>
</table>
| Goals, Objectives, & Actions | Stated Values:  <ul>  → Access and Connectedness  
→ Safety and Security  
→ Sustainability: Environmental, Social, and Economic  
→ Efficiency in Resources and Personal Time  
→ University Culture: Scholarship, Athletics, Traditions, and Community  
→ Responsibility and Respect  
→ Aesthetics  
</ul>  
Stated Goals (Each goal also has stated objectives):  <ul>  → Goal 1: Improve connectivity for all modes of travel.  
→ Goal 2: Create a more pedestrian-friendly campus: one which encourages and supports efficient, pleasant, and safe walking experiences.  
→ Goal 3: Create a more bicycle-friendly campus: one which encourages and supports efficient, pleasant, and safe biking experiences.  
→ Goal 4: Create a more transit-friendly campus: one which increases the effectiveness of transit and encourages the use of transit.  
→ Goal 5: Reduce personal vehicle congestion on campus.  
</ul> |
| Public Involvement Process | Not Stated |
| Other Notes | Previous Plans and Studies: UMD Campus Bicycle Study, 2001-2020 Facilities Master Plan, Campus Sustainability Report, 2010 Campus Transportation Survey, and Other Plans and Studies Reviewed for the FMP |
### University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>University of New Mexico — UNM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>UNM Campus Bicycle Master Plan (draft 4/24/2009)</td>
</tr>
</tbody>
</table>

| Methodology: | → Identified primary, secondary, and tertiary pedestrian paths  
| → Overlaid pedestrian, automobile, and campus shuttle routes on top of each other and visually identified points of conflict |

| Goals, Objectives, & Actions: | Goals:  
| → Promote sustainability as a core value of UNM including energy efficiency, longevity and durability.  
| → Reduce vehicular travel by promoting alternative modes including bicycles.  
| → Promote safe transport of bicycles, pedestrians, buses, people movers and the auto.  
| → Provide efficient wayfinding signage to help people safely get to where they are going.  
| → Provide secure bicycle parking and storage facilities located close to buildings.  
| → Provide conveniently located shower and locker facilities for bicyclists.  
| → Provide additional curb cuts and eliminate barriers for bicyclists.  
| → Provide separation of bicyclists from vehicles and pedestrians where possible.  
| → Provide adequate lighting for safety.  
| → Promote bicycle safety training and awareness programs.  
| → Promote on campus bicycle repair and information programs.  
| → Promote an on campus bicycle loan program.  
| → Encourage City of Albuquerque bicycle lane and trail improvements connecting to UNM and collaborate with the City.  
| → Promote ADA regulated safety for the handicapped, especially on shared paths.  
| → Provide for bicycle amenities that meet current AASHTO, NMDOT, Federal Highway Administration, and all local codes, guidelines and specifications. |

| Guiding Principles and Solutions: | The UNM campus shall be first and foremost a pedestrian environment supported by bicycles, people movers, shuttles and buses, automobiles, and regional transportation provided by the City.  
| → A Master Plan Map of major bicycle routes throughout the UNM campus shall be created to facilitate and guide future improvements and preserve right-of-way accessibility to key locations. The Master Plan Map shall integrate all modes of transportation wherever possible and be updated as required to conform to all Regional and City Transportation Master Plans.  
| → A needs assessment for bicycle parking throughout campus shall be updated periodically to accommodate the needs of bicyclists. This shall include secure bicycle and storage facilities.  
| → Wayfinding and signage improvements shall be assessed to accommodate the safety and needs of bicyclists with all modes of transport while conforming to a campus-wide Wayfinding Plan.  
| → Handicap safety and needs shall be assessed and improved whenever necessary and conform to all ADA requirements and local codes.  
<p>| → Infrastructure, roads, utilities, pathways, lighting, paving, curbs, signage, landscaping, ramps, stairs, and barriers shall be evaluated and improved for safety and reducing conflict between bicycle and other modes of transport. All improvements shall be regulated by AASHTO, NMDOT, Federal Highway Administration, and all State and local codes, guidelines and specifications. |</p>
<table>
<thead>
<tr>
<th><strong>Public Involvement Process</strong></th>
<th>Not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other Notes</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

All new buildings, development, and infill shall require compliance with the Bicycle Master Plan Guiding Principles and Solutions to ensure the interconnection of new facilities with the existing bikeway system. Bicycle and pedestrian connectivity shall be provided during all construction phases.

A needs assessment for lockers and showers shall be performed to accommodate bicycle commuters.
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>University of North Carolina at Chapel Hill</th>
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</thead>
<tbody>
<tr>
<td>Title of Plan:</td>
<td>UNC Campus Bike Plan</td>
</tr>
</tbody>
</table>
| Methodology: | → Evaluation of current conditions – data collected on mode use through campus survey, evaluation of existing network and plans, and identifying key organizations and groups.  
→ Engineering Recommendations  
→ Education, Encouragement, and Enforcement Recommendations  
→ Implementation Strategies |
| Goals, Objectives, & Actions: | **Vision:** Bicycling is an integral part of UNC-CH culture and how the community gets to, through and around campus.  
**Goals:**  
→ Increase safety for all campus users including bicyclists, pedestrians, transit users and drivers. The large population of students, workers and visitors who access the UNC-CH campus each day can result in congested roads and pathways. Crowded conditions often lead to conflicts among bicyclists, pedestrians and vehicles. Feedback received throughout the Plan process indicated that the campus community wants to improve safety for travelers using all modes.  
→ Build a culture of bicycling among UNC-CH students, staff and faculty. Making bicycling a more visible and attractive transportation choice has many benefits: as more people choose to ride bikes on and near campus, others will be encouraged to do the same. Developing a culture of bicycling will also help UNC-CH achieve designation as a Bicycle Friendly University. Other universities have found this designation helps them find funding for bicycle improvements, and advances their reputation as sustainable campuses.  
→ Use education and enforcement to improve bicycling and safety for all road and pathway users. Many students and visitors come to campus from communities where bicycling is not the norm, so the University has a responsibility to educate bicyclists, pedestrians and drivers about how they should interact with other modes of travel. Education, combined with enforcement of applicable policies and laws, will be important for all travelers.  
→ Create well-known and connected north–south and east–west bicycle routes through campus. The creation of well-marked, easy to follow routes through campus will make bicycling easier and aid new bicyclists in choosing where to ride. These routes will be created through on-the-ground infrastructure improvements.  
→ Fund bicycle improvements on campus. Bicycle friendly universities tend to have dedicated sources of funding for infrastructure, staff, programs, signage, promotional materials and other elements. |
| Public Involvement Process: | The planning process included a steering committee that went through a series of 3 workshops to guide plan development, stakeholder interviews, community input through an online survey, interactive maps made available, informational meeting, and a open house. |
| Other Notes: | The strongest section is the Education and Encouragement Recommendations. A more in depth public involvement overview is outlined in the appendix. |
# University Bicycle and Pedestrian Plan Analysis

## University:
University of North Carolina Greensboro—UNCG

## Title of Plan:
Campus Bicycle Master Plan

## Methodology:
- Evaluation of current conditions
- Bicycle circulation plan
- Facility design guidelines
- Bicycle parking plan
- Programs and policy recommendations
- Implementation

## Goals, Objectives, & Actions:

**Stated Goals and Objectives:**
- Safety: To have safe bicycle routes and facilities where bicyclists of varying skill levels feel comfortable riding their bikes. In this atmosphere, bicyclists are aware of the "rules of the road," bicycle lanes are kept clear of parked cars, and bicyclists enjoy high visibility as viable users of area roadways.
- Connectivity: To create an inter-connected network of bicycle facilities including marked bike lanes and off-road trails that allow for access to all destinations on campus, as well as links to key destinations off-campus, such as student and staff housing, shopping and retail districts, and downtown so that the students, faculty and staff can travel by bicycle to work, school, and shopping destinations.
- Incentives & Amenities: To develop bicyclist-friendly amenities that will make bicycling an easy and convenient mode choice and incentivize bicycling in small ways to promote bicycling as a viable commuter choice.
- Education & Encouragement: To educate bicyclists and motorists alike about the benefits of safe bicycling by distributing informational pamphlets, engaging staff and students in campus-wide bicycle safety programs and hosting University-sponsored bicycling activities (e.g., "Bike to Work Week" event).
- Aesthetics: To maintain the visual appeal and appearance of the campus, while also providing effective bicycling facilities.

## Public Involvement Process:
- The steering committee provided the primary leadership through the planning process
- Public outreach included an open house to gather information regarding current campus bicycling conditions as well as a community survey
- An online website was also created to keep the community informed

## Other Notes:
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>Vermont</th>
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<tbody>
<tr>
<td>Title of Plan:</td>
<td>Pedestrian &amp; Bicycle Circulation (A section of the Vermont Transportation Plan)</td>
</tr>
</tbody>
</table>
| Methodology: | → Identified primary, secondary, and tertiary pedestrian paths  
→ Overlaid pedestrian, automobile, and campus shuttle routes on top of each other and visually identified points of conflict |
| Goals, Objectives, & Actions: | None |
| Public Involvement Process: | Not stated |
| Other Notes: | Visual displays may be helpful in analysis, however, the process of obtaining the data was not stated |
# University Bicycle and Pedestrian Plan Analysis

<table>
<thead>
<tr>
<th>University:</th>
<th>Washington State University</th>
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<tbody>
<tr>
<td>Title of Plan:</td>
<td>Washington State University Bicycle and Pedestrian Plan</td>
</tr>
</tbody>
</table>
| Methodology: | - Developed from research of existing national, state, and university goals, policies and objectives  
- Existing plans and policies from WSU, Pullman, and Whitman County were examined to inform the recommendations in this plan |
| Goals, Objectives, & Actions: | Stated Goals (Plan also includes objectives and action steps for each goal)  
- Health and Safety: Providing and promoting safe and accessible routes and accommodations for walking and biking as a daily form of physical activity.  
- Education and Encouragement: Implement comprehensive education and encouragement programs targeted at students, faculty, and staff.  
- Enforcement: Improve enforcement of bicycling and walking on campus.  
- Transit Integration: Improve the connection between bicyclists and transit on campus.  
- Sustainability: Support campus sustainability goals.  
- Implementation: Create a campus non-motorized network that is integrated into existing and future off-campus facilities.  
- Accountability: Monitor implementation of the WSU Bicycle and Pedestrian Plan. |
| Public Involvement Process: | 3 tools were used for public involvement:  
- Community workshops  
- WSU Bike Plan Taskforce  
- Stakeholder Meetings/Interviews  
Details surrounding the public process are in Appendices C and D |
| Other Notes: | Format followed:  
- Background  
- Existing Conditions  
- Needs Analysis  
- Recommended Improvements  
- Implementation Strategies  
- Appendices  
Formatted landscape, allowed for larger pictures, maps and charts |