University of Louisville

Bicycle Master Plan
2011

Table of Contents

Students walk along Shipp Ave truck route to new Province Apartments, beyond vacant, industrial parcels west of Belknap campus.

Authors

Kenneth Dietz, Director, University Planning, Design & Construction

Janis Eberenz, Intern, University Planning, Design & Construction

Justin Mog, Assistant to the Provost for Sustainability Initiatives

Larry Owsley, Vice-President for Business Affairs

Executive Summary

UofL is seeking to reduce the number of cars being driven to campus and to promote the use of the bicycle for transportation, while maintaining campuses which are safe and convenient for all users. These goals are essential components of the university's commitment to sustainability, climate neutrality, the health and wellness of our campus community, and the vitality of our neighborhood and city. This Bicycle Master Plan for UofL is a roadmap for achieving these goals in tandem with UofL's broader campus master planning efforts and with Louisville Metro's efforts to create a more bike- and pedestrian-friendly city.

Goal 1: Create campus infrastructure where bicycling and walking are convenient, safe & preferred

Objective 1.1 Belknap Campus Core: Provide system of separated and shared-use paths to minimize bike-pedestrian conflicts

Action 1.1.1: Prioritize needs of bicyclists and pedestrians in design and development of the campus core.
Action 1.1.2: Provide separate bike and pedestrian paths wherever practical within campus core.
Action 1.1.3: Clearly delineate user areas with unique surface treatments, signs, racks, and lighting.
Action 1.1.4: Design to LEED-ND bike design guidelines
Action 1.1.5: Create educational core loop connected mixed-use trails
Action 1.1.6: Plan for mixed-use trails on future development parcels and connect to existing Loops
Action 1.1.7: Voluntary bicycle registration program and enforcement of abandoned bike Action

Objective 1.2 Streets and Intersections: Improve walk-ability and bike-ability for campus commuters

Action 1.2.1: Design for most vulnerable pedestrians and all skill levels of bicyclists
Action 1.2.2: Designate "University Bike and Pedestrian District" improvement areas
Action 1.2.3: No truck routes through campus or immediate perimeter
Action 1.2.4: Partner with residential and business neighbors for Complete Streets development

Objective 1.3 On-campus bicycle amenities

Action 1.3.1: Provide sufficient bike facilities and parking to meet demand and make bike commuting safe and convenient
Action 1.3.2: Support the creation of a campus bike shop where basic repairs and parts/accessories are accessible and affordable
Action 1.3.3: Provide bike maps and signage on campus to direct people to safer routes to and within campus

Goal 2: Reduce percentage of single occupant vehicle (SOV) trips to, within, and between campuses

Objective 2.1 Support inter-modal commuting to Belknap, HSC, and Shelby

Action 2.1.1: Promote use of TARC to get to UofL, including Belknap to HSC shuttle service and bikes-on-board
Action 2.1.2: Explore possibilities for a Shelby pilot program for suburban park-and-ride depots with express bus routes to campuses
Action 2.1.3: Create on-street bike facilities connecting Belknap to HSC in both directions (e.g., bike boulevard pilot program)
Action 2.1.4: Provide secure intermodal and bike share depots on campuses with out-of-the elements bike parking
Action 2.1.5: Provide free or low-cost bike-share options at Belknap and HSC
Action 2.1.6: Collaborate to create a city-wide bike-share program with stakeholders from government, schools, businesses, etc.

Objective 2.2 Transportation demand management

Action 2.2.1: Create free bicycle program for those willing to forgo a UofL Parking Permit
Action 2.2.2: Price auto parking permits to support progressive reductions in SOV commutes
Action 2.2.3: Provide incentives and online matching system for carpools and vanpools
Action 2.2.4: Provide support and incentives to encourage employees and students to live within biking and walking distance of UofL
Action 2.2.5: Regularly monitor UofL commuter mode-share, attitudes and needs; and revise SOV reduction strategies accordingly

Goal 3: Nurture the growth of a culture of bicycling for transportation within the UofL community

Objective 3.1 Biking programs for students

Action 3.1.1: Provide education and training programs for students in safe, confident cycling and bike maintenance
Action 3.1.2: Promote safe bicycling for transportation and wellness through UofL's Campus Health Services & Promotion
Action 3.1.3: Host extracurricular and special events with focus on bicycling for transportation (see LEED-ND programming items)

Objective 3.2 Bicycling programs for employees

Action 3.3.1: Provide education and training programs for employees in safe, confident cycling and bike maintenance
Action 3.3.2: Promote safe bicycling for transportation and wellness within UofL's Get Healthy Now employee wellness program
Action 3.3.3: Provide on-campus employee bicycle fleets

Objective 3.3 Analyze and market UofL transportation sustainability goals

Action 3.3.1: Annually collect and distribute data on UofL commuter behavior and transportation alternatives attitudes/needs
Action 3.3.2: Market transportation aspects of campus sustainability indicators and the Presidents' Climate Commitment

Introduction

"As people all over the country gravitate toward taking action on climate change, more and more eyes are looking to college campuses in search of bold new solutions. Campuses are filled with young passionate minds, mentors with diverse experience, advanced research facilities—in short, many of the resources we need to address this challenge. Thus Colleges and Universities have a unique opportunity to take real action on climate change and serve as a model for the rest of the nation to follow." (Source: cleanair-coolplanet.org)

University of Louisville Belknap Campus Library Quad

Each of University of Louisville's three strategic goals for the next 20 years are directly related to the quality of its three campuses' built environments:

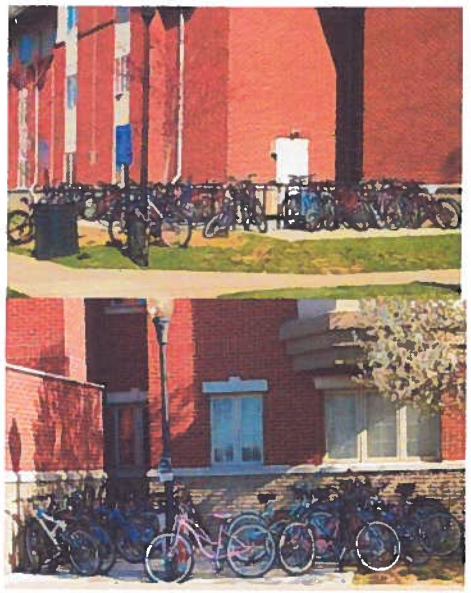
- The first goal is to attract top-tier undergraduates, improve campus life/success.
- Second is for the university to be a "Good Neighbor" in the community.
- The third goal is to attract top researchers and research dollars to the campus.

Transforming the Belknap, Health Sciences Campus and Shelby campuses into model built environments where pedestrians and cyclists feel safe in world-class public spaces is critical to achieving all three of these goals. It is also vital to achieving UofL's Climate Action Plan[1] goals for reducing the number of people driving to campus.

[1] UofL's September 2010 Climate Action Plan is available at http://acupcc.aashe.org/cap/700/

Kenneth Dietz, Director of Planning, Design and Construction at UofL estimates:

- Today there are ten times more bikes on campus than five years ago
- The new Province and Bellamy apartments west of campus have created at least an additional 4,000 daily east-to-west pedestrian trips on Brandeis and crossings of 2nd, 3rd and 4th Streets.
- The university is planning to increase its current 24% of undergraduates living on-campus to 30% in the next few years.



The increasing popularity of bikes on campus is evident in the full bike racks at west campus residence halls.

Clearly, these projected increases in pedestrians and cyclists will require the redesign of streets and intersections which were originally designed and built based on much lower pedestrian and bicycle traffic. The addition of bike pathways, mixed use pathways, green spaces and clearly defined interaction points between walkers, cyclists and cars are needed to ensure the safety of the university community.

Dr. Justin Mog, Assistant to the Provost for Sustainability Initiatives at UofL, points out the importance of encouraging bike, pedestrian, bus and carpool commuting in order for the university to meet its goal of progressively reducing greenhouse gas emissions over time. Though commuting currently only accounts for an estimated 9% of UofL's total carbon footprint, achieving climate neutrality will require the largest possible reductions in carbon producing activities in all areas; changing the behaviors of commuters will be imperative to reaching the goals for the university's transportation sector. Mog reminds us that the more ways the university can promote alternative transportation and make it more convenient, visible, and safe, the more it will improve sustainability.

Possibilities to increase cycling and walking include providing secure, out of the elements bike parking, training for the UofL community in safe and confident cycling, clearly defined bike and pedestrian pathways, and an increase in both the quantity and quality of signage and maps, both on campus and perimeter roadways. He reiterates the importance of looking at other cities' cycling and pedestrian infrastructure, such as the multi-use paths prevalent in Madison, Wisconsin, automated commuter bike rentals in Denver and Minneapolis, and new ways of reserving bikes by cell phone or by checking out bikes from bike-share-stations by swiping debit or student identification cards.

By incorporating bike, pedestrian and intermodal design principles learned from cutting-edge-city prototypes worldwide, the University has the opportunity to create safer, faster and cheaper transportation for students, faculty and staff, in addition to leading the city and region in educating the public about the benefits of alternative modes of transportation.

As Stacey Burton of the Kentuckiana Regional Planning & Development Agency (KIPDA) explains, "The University of Louisville could be the shining example of bike and pedestrian transportation design for the entire area."

Cyclist going wrong way in cross walk at 3rd & Cardinal

Using designs that clearly define exactly where bicyclists, walkers and drivers are expected to travel, and truly understanding commuters' needs, will be vital to encouraging people of all skill levels to incorporate more walking, cycling and bus usage into their daily commute patterns. These design modifications are needed not only directly on UofL campuses, but improving roads around campus will be imperative to creating an environment where more students, faculty and staff want to live, work, play and relax.

UofL is actively working with Louisville Metro government to advance such improvements. Since 2004, UofL, Jefferson County Public Schools and Metro government have cooperated through the Partnership for a Green City. One of the Partnership's goals is to reduce greenhouse gas (GHG) emissions in the community to 7% below 1990 levels by 2012, as called for in 2005 Kyoto Protocol. In 2008, UofL President James Ramsey took a leadership roll in the city by signing the American College & University Presidents Climate Commitment, pledging UofL to achieving climate neutrality.

The Clean Air-Cool Planet Guide used by many signatories suggests a four-step model for campus climate action:

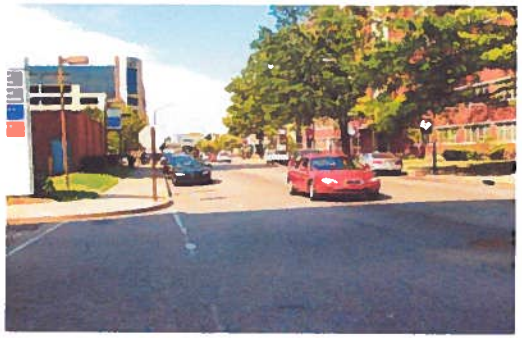
- Bring People Together
- Find Data
- Get Creative
- Present Your Ideas

Belknap Campus First Street Walk

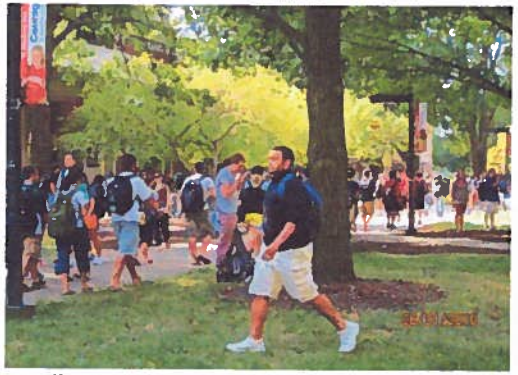
Third Street sidewalk headed north from campus at Cardinal Boulevard

This Bicycle Plan echoes that model, with the purpose of bringing people together, both within the university community and beyond to gather information, meet, discuss, brainstorm, be creative and share ideas for a more sustainable, reduced carbon transportation system. This plan includes input from administrators of various campus departments and programs including health, education, parking, safety, enforcement, business affairs, sustainability council, and campus planning as well as data from students, faculty and staff which was gathered in a campus-wide March 2010 transportation survey. As Larry Owsley, UofL Vice-President for Business Affairs points out "The University cannot do this alone...." Working closely with the Transit Authority of River City (TARC), Metro's Bike Louisville program, neighborhoods and advocacy groups will be vital to UofL's success.

The American Association of Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities directs planners of bicycling networks to first carefully assess existing conditions. Special attention must be paid to the diverse set of challenges and opportunities which each physical setting presents. Bicycle Plans will vary greatly depending on factors such as traffic congestion, driver education, bus and truck traffic, street system designs, speed limits, crash sites, and opportunities or barriers such as railroads, streams and interstates, crime and community attitudes. The University of Louisville has a unique opportunity to address bicycling, walking, busing, carpooling and private auto use to and from our three distinct campus environments.



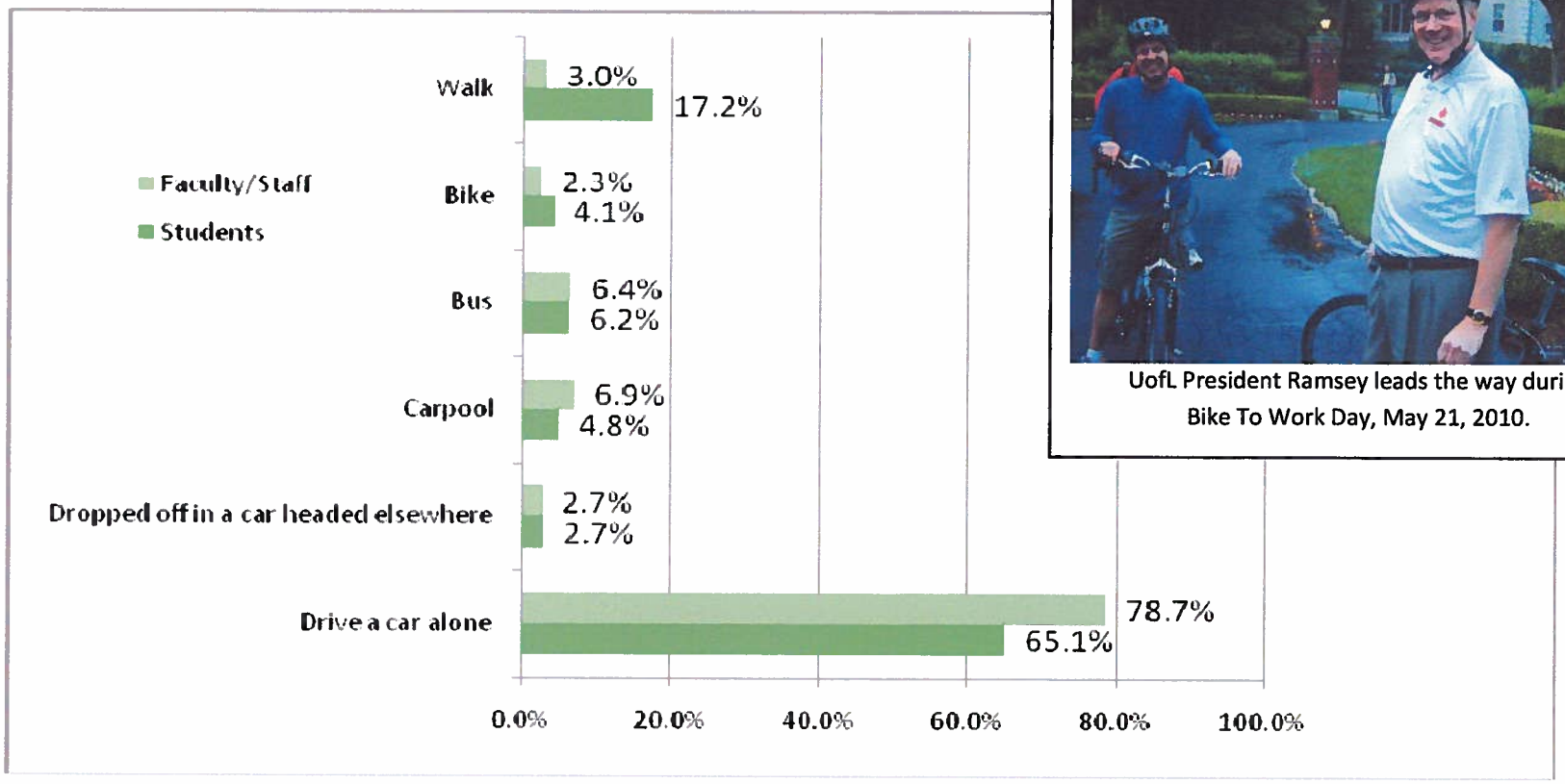
The **Health Science Center** is in a dense grid of downtown streets with minimal green space



Belknap Campus has busy sidewalks in the Library Quad during a class change

Shelby Campus is located in a suburban setting of multilane roads, no sidewalks

Existing Opportunities and Challenges



UofL President Ramsey leads the way during Bike To Work Day, May 21, 2010.

Travel modes to all UofL campuses according to the March 2010 Transportation Survey. Full results are available in **Appendix A.**

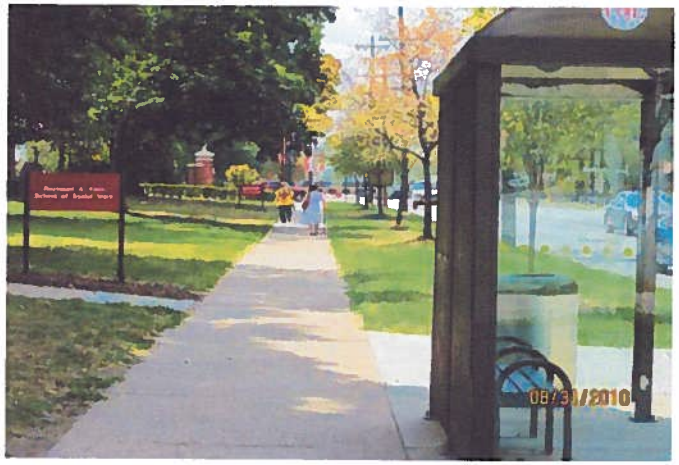
Belknap Campus

The educational core of the Belknap campus provides great opportunities for creating a system of quick, safe and pleasant bicycle pathways in order to encourage cycling as an alternative to auto use. The core campus has a park-like setting of quads shaded by mature trees. The grassy areas between buildings in the educational core have crisscrossing sidewalks going in every direction. In short, it is a beautiful area with ample space for creating separated bike and pedestrian circulation routes.

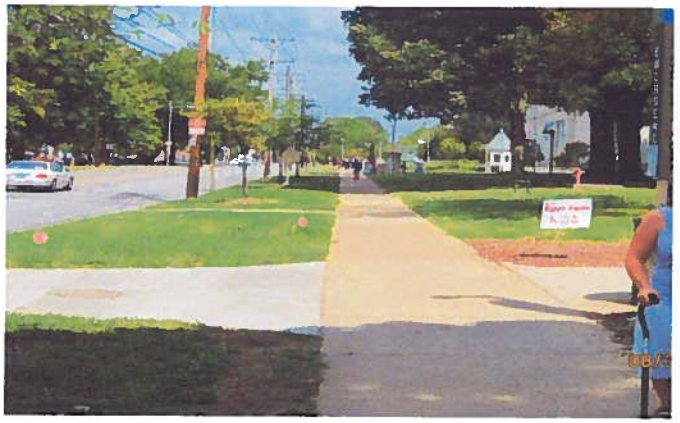
Wide grassy areas line much of the roadway surrounding Belknap's educational core, providing the opportunity to create a system of Class I bike (separated bike-only) and/or mixed-use bike/pedestrian pathways around the campus. Creating a linear park, or green ribbon pathway, around the perimeter of the core campus would encourage less experienced riders to try biking as a safe, quick means of getting around. This would provide a 1 ¼ mile route with few interaction points with autos.

Additional linear parks, or green bikeway loops, could be incorporated into future development parcels to create an eleven mile system of bike trails throughout the Belknap campus as the master plan is developed over the next 20 plus years. These additions in green space would be valuable assets to surrounding residents and business owners by increasing property values, physical activity, community interaction and safety by putting more eyes on the street.

Many areas on Belknap have multiple sidewalks; signage and markings would create separate bike/walk zones.



The potential exists for a widened mixed-use bike and pedestrian loop around the perimeter of Belknap Campus.



Belknap Campus, August 4, 2009.

Another important challenge for UofL was brought into sharp focus during the massive rainfall event on August 4th, 2009 which resulted in nearly $21 million of significant damage to the university.

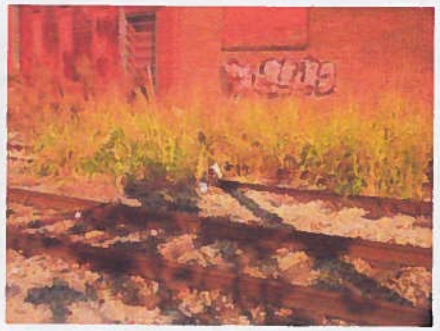
Improvements in storm water management on the campus, such as bio-swales and slow release containment areas, could be incorporated with bike path construction projects. Both within the core campus and at intersections, rain gardens and water retention areas could be incorporated into curb bump areas and bio-swales. Pervious surfaces could also be used to help manage storm water runoff during heavy rains.

The configuration of bicycle pathways on the core campus could also be used as an opportunity to improve access for emergency response vehicles to core campus buildings surrounding the inner quads.

The university district surrounding the educational core of the Belknap campus faces a wide array of challenges for promoting alternative modes of travel. A mix of surrounding neighborhoods and roadway conditions includes early 1900s era mansions on wide multilane boulevards, shotgun houses on narrow streets, aging roadways that crisscross industrial rail corridors, and green grass

ribbons along roadways. The later were originally designed in the early 1900s as elements of the multi-modal transportation design of the Olmstead Parkway system.

Many of the large residences on the wide boulevards have been converted into multi-family and student housing creating the need for multiple, on-street parking spots per dwelling. Reducing the number of people who feel they need a car when living close to campus as well as reducing the number who drive single occupant vehicles (SOV) to campus will require not only changing mindsets regarding the economic, environmental, health and social implications of personal travel choices, but sensible design and mixed-use neighborhood development including increasing the availability of mixed commercial and service business to this area.



Railroad corridors around campus may provide bikeway opportunities

Recent improvements to roadways around the perimeter of campus have been designed to help people begin to make this shift in how they get around. Projects have included a road diet with bike lanes on Eastern Parkway, traffic calming medians on 4th Street, a high-visibility pedestrian crossing on Floyd Street at the Swain Student Activities Center, and the beginning of improvements to Warnock Street under I-65.

Additional improvements are on the drawing board for Freedom Park between 2nd and 3rd, the pedestrian crossing area at Eastern Parkway and 3rd Street, Stansbury Park between 3rd and 4th Streets, and road diets for Floyd Street and Cardinal Boulevard.

Many bicyclists are intimidated by the high volumes and speeds of automobile traffic around campus and are likely to continue using sidewalks and pedestrian crossings to get around until sufficient traffic calming is implemented and training is provided in safe, confident cycling in traffic. Insuring that a complete bicycle system (referencing up to date, successful models from other cities) is incorporated into all future and current plans is imperative to give the university community the security to get on bikes and ride.

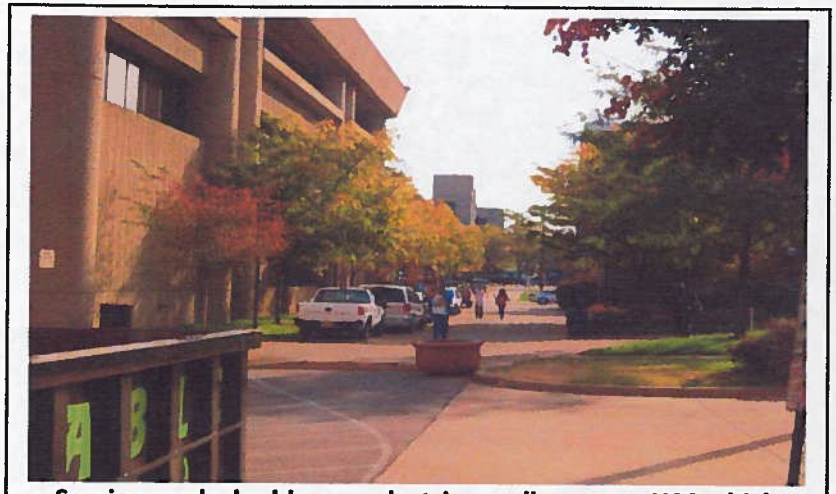
Appendix B provides additional discussion of current traffic counts and truck routes around Belknap campus, and Appendix C provides some initial physical design elements which could be incorporated into a safer, more inviting UofL campus for both bicyclists and pedestrians.

Health Sciences Center (HSC)

The HSC campus is located in the heart of the original city street grid system and is in the midst of world class hospitals, research facilities and doctors offices. Visitors and commuters to the HSC campus include the students, staff and faculty of the university as well as visitors and patients from all over the region. The high volume of pedestrian traffic in the area creates potential conflict scenarios, but also has resulted in reduced auto speed and increased driver awareness that they must share the road and be careful. Tapping into the public health expertise on this campus will be an important element in helping to educate the entire university and community on the health benefits and disease reduction possibilities associated with changing transportation habits.

Health Science Center Mixed-use Pathway

Pedestrian walkways and service vehicle drives occupy restricted portions of Madison Street/Abraham Flexner Way, which functions as the primary east to west pedestrian link between HSC buildings. Curb cuts, signage and surface markings incorporating separated



Service roads double as pedestrian walkways on HSC which could be transformed to accommodate bikes.

Auto use is restricted on Madison Street/Abraham Flexner Way.

or marked bicycle lanes are needed to transform this corridor into a mixed use pathway and connector route for HSC bike travel. This mixed use pathway would also intersect an on-street bike facility to Belknap Campus (e.g., Floyd or Brook Street), explored further in Appendix D.

Shelby Campus

The Shelby Hurst Campus is a large green space located in suburban eastern Jefferson County which the university has recently began redeveloping as an academic research and business office campus. The campus is bordered by multilane thoroughfares, shopping centers and suburban neighborhoods with winding streets and dead end cul-de-sacs, often with no sidewalks, which are not conducive to mixed modes of travel.

However, the recent construction of new roads with bike lanes on the Shelby Hurst campus has created an opportunity for the university to use the campus as a trial intermodal transit depot for commuters to the two downtown UofL campuses. Bicyclist can now get to Shelby on the new bike lanes on Whipps Mill Road and on the wide concrete pathway along Hurstbourne Parkway (with few auto interaction points) to the north.

A ribbon of green space extends more than a mile, with few roadway interruptions, along the north side of Shelbyville Road to the west of the campus, offering the potential for construction of a shared use path leading to the campus from the east and west ends of Shelbyville Road. This would also provide important car-free access to surrounding shopping, restaurants, and other business/retail establishments.

A study of intermodal depot locations and direct bus routes may provide transportation alternatives which are financially beneficial to employees and the university alike. The question of how to get commuters from even

New bike lanes on Shelby Hurst campus provide an opportunity to create a multimodal transit depot.

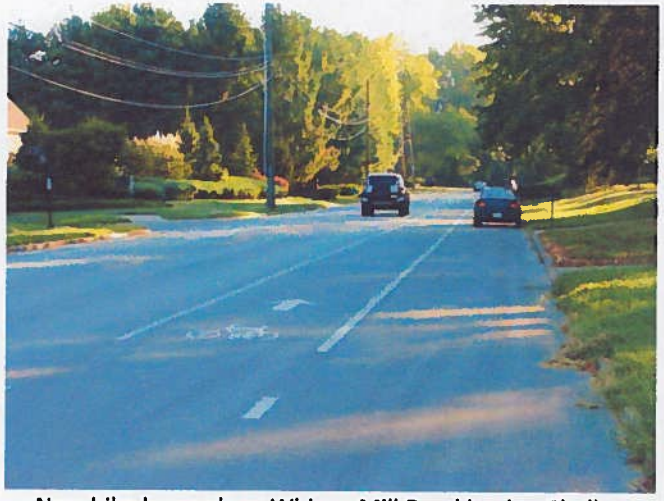
A shared use pathway along Shelbyville could lead to an intermodal depot on Shelby Campus for both pedestrians and cyclists: no sidewalks exist currently.

further out in the county and beyond to choose a combination of walking, bicycling and transit to get to the university's campuses is complex, but worthy of further consideration as UofL's population grows.

Potential for shared use pathways along Shelbyville road to provide bike and pedestrian access.

Founders Union offers a protected location for bus commuters to gather and load shuttle to downtown.

Existing Shelby Campus parking lots where a UofL Suburban Intermodal Depot could provide direct bus routes to both downtown campuses.



New bike lanes along Whipps Mill Road lead to Shelby Campus and proposed intermodal depot location.

Implementation Plan

"The goal is to promote transition, through behavior change, toward an environmentally sustainable community."
- Partnership for a Green City

In line with the goals of the Partnership for a Green City and UofL's Climate Action Plan, implementation of UofL's Bike Master Plan is intended to encourage changes in the transportation choices of the university community and surrounding residents. Changed travel behaviors hold the key to reducing vehicle miles traveled to campus (VMT), and thus the amount of pollution and greenhouse gas emissions, as well as mitigating the pressures on university resources to provide parking.

Creating the conditions which will encourage and protect people as they try out new ways to get around requires a mix of incentives from social, to financial, to health and physical improvements to support alternative modes. Priority infrastructure changes include the following areas:

Belknap Campus

- The Educational Core
- Perimeter streets at edge of the educational core
- Future development areas in the Belknap Master Plan

HSC Campus

- Create mixed-use pathway on existing pedestrian and service drive
- Connect to on-street bike facility to Belknap Campus

Shelby Campus

- Suburban Intermodal Depot; UofL pilot program
- Direct UofL buses to Belknap and HSC
- Mixed-use pathways to Shelby Campus

Belknap: Educational Core Design

The plan designates three main bike pathways:

- Library Plaza Loop, ½ mile
- Educational Core Loop, 1 ¼ mile
- Cardinal Park Loop, ¼ mile

The plan recommends the following design elements:

- Signs with destinations, distance, ride/walk times
- Separate surface treatments for bike, pedestrian and auto
- East to west bike and pedestrian connections
- Provide bike share, bike parking and bike support depots
- Storm water management
- Emergency vehicle access
- Further specific design elements are sketched in Appendix C.

Bike and pedestrian crossings of vehicular traffic zones should be clearly marked to prevent car access and warn cyclists and pedestrians.

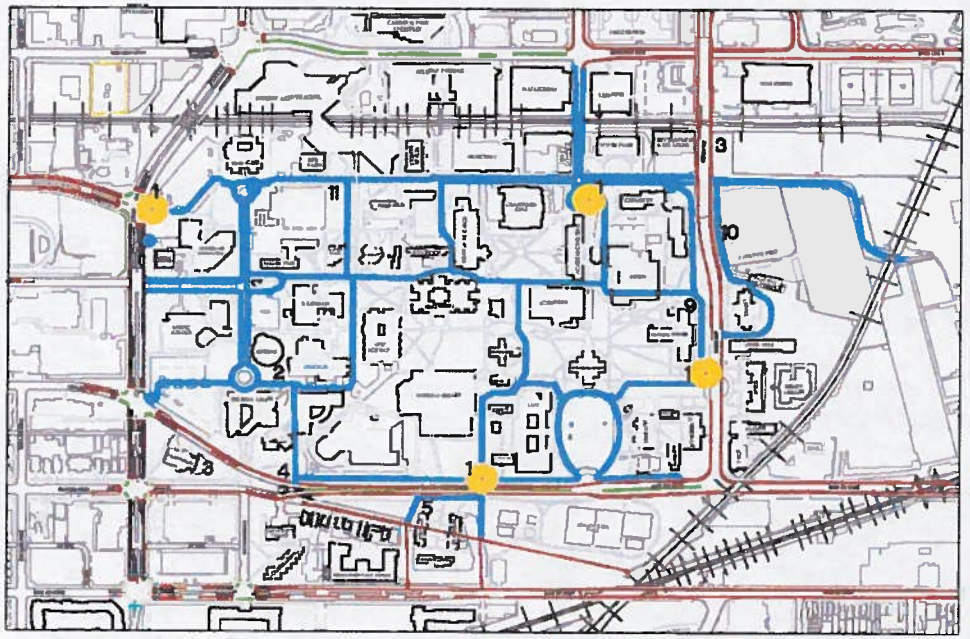
Bicycle support signage could identify service areas on campus.

Bike paths and shared-use paths are safer and encourage less experienced riders to start using bikes.

Surface treatments should define separate bike, walk and vehicle zones on campuses.

Cyclists should be encouraged to dismount where bike paths and shared-use paths meet high pedestrian traffic areas such as the Library Quad on Belknap Campus.

Belknap Campus Bike Plan Schematic



1 Bike Gateway: Lighted, named bike–only entry points into educational core of campus.

2 Bike lane surfaces on interior campus roadways to match bike pathways, and mixed use bike lane surface

Intersection improvements shall clearly define bike and pedestrian travel zones and visibility by incorporating:

3 Bike Lanes to surround Belknap Core Campus for commuter cyclists. Shared use pathways provided for on campus travel

4 Mixed–use bike and pedestrian pathway on 2nd Street behind new bus pull off area

5 10' bio–swale median, raised table pedestrian refuge and bicycle crossings every 400' to eliminate random east to west crossings of Third St.

Bike and Pedestrian Crossing Signals and signage.

Install intermodal wayfinding signs on and off campus with distance and travel times for walking and cycling

11 Educational Core Bike and Pedestrian Loop

10 Mixed–use bike and pedestrian pathway

9 Improve bike access to and from campus bike loop at Eastern Parkway near Speed School traffic signal

8 Eastern Parkway Bike Gateway to educational core loop

7 Delineate bike pathways from service access zones.

6 Library Quad Bike Loop separated from pedestrian walkways.

Mixed–use path above curb, west of 3rd Street adjacent to Stansbury Park

Dismount zone in interior library quad

Belknap Campus Future Development Areas

The plan creates a system of bicycle trails along the perimeters of large campus parcels to link current and future campus areas by incorporating 11 miles of linear park, bike and pedestrian trails for the university community and its neighbors. These trails will enhance surrounding residential property values and increase safety by getting more eyes on the streets. This trail system will support the university's Good Neighbor goal by encouraging less skilled riders, older riders and families with children to get out and exercise, interact and enjoy their community. An additional function of these trails will be to enhance the community's storm water management by incorporating pervious surfaces and rain gardens into the design of the trails in the following areas:

- Northeast Campus,1 ¼ mile
- East Campus,
- Southeast Campus,
- South Campus, 1 mile
- West Campus,1 mile
- Park Hill Trail to 7th Street

Project List

Project Location	Description	Lead Responsibility	Priority Level	Comments
ON CAMPUS				
Library Plaza Loop	Separate bike and pedestrian surface treatments; storm water management areas; emergency vehicle access improvements	UofL	High	
1st Street to Miller IT building,	Shared use pathway connections to Library Loop to north and to south; storm water management areas; emergency vehicle access improvements	UofL	High	
Educational Core Loop	Shared use pathway, along Cardinal to new Brook Street Bike Gateway	UofL	Medium	
"The Oval" Bike Gateway	"Signature" UofL Bike Gateway, signage	UofL	Low	
Brook Street on-campus	Bike Boulevard designation, signage	UofL	High	
Way-finding Signage System	On campus bike signage with distance, ride time, walk time to destinations on and from "gateways" to off campus destinations	UofL	Low	
Bike Depots	Inner-campus, bike parking and bike share locations with maps/data, covered parking, water, supplies	UofL	High	
CAMPUS PERIMETER				
3rd Street northwest of library, shared use pathway crossing	Traffic calming w/ new raised table crossing, planted median	UL/Metro	High	
Improve existing pedestrian Crossing on 3rd street southwest of library	Traffic calming w/ raised table, widen to shared use pathway width, connect library loop and Stansbury Park shared use path	UL/Metro	High	

Project Location	Description	Lead Responsibility	Priority Level	Comments
Brook Street Bike Gateway to Belknap Campus	"Signature" UofL Bike Gateway, Bike traffic signal, signage	UL/Metro	Low	
Eastern Parkway Bike Gateway to Belknap Campus	"Signature" UofL Bike Gateway, curb cut and bike surface designation, signage, bike traffic signal, bike boxes both directions at intersection at Speed School.	UL/Metro	High	
Intermodal Stations	Edge of campus, covered walk, bike, bus depot, with bike parking, bike-share, maps/data, water, supplies	UofL/ TARC	Low	
Cardinal Blvd.	Traffic calming 4th Street to Arthur w/ curb bumps, bike lanes, bike boxes, bike signals and raised pedestrian crossing surface	UL/Metro	High	
Floyd Street Road Diet	Traffic Calming w/ curb bumps, bike lanes, bike boxes, medians, bike signals	UL/Metro	High	
Warnock from Brook (inner campus) to Crittenden	Traffic calming w/curb bumps, bike lanes, bike boxes, bike signals,	UL/Metro	Medium	
Crittenden at Eastern Parkway	Traffic calming w/ curb bumps, Bike lanes	Metro	Low	
3rd Street at Greek row	Splinter island for bike lane approach into Greek row; curb extensions to calm traffic and pedestrian safety	UL/Metro	Medium	
UNIVERSITY DISTRICT				
Bike-share stations in university districts	Saint Joseph's, Old Louisville, Park Hill, California, Russell, Southern Parkway, Winkler, Algonquin, HSC, Shelby Campus	UL/Metro/ Corporate/ Nonprofit/	Low	
Bike Boulevard Audit	Brook and First from Belknap to HSC	UL/Metro	High	

Action Plans

Objective 1.1 Belknap Campus Core: Provide system of separated and shared-use paths to minimize bike-pedestrian conflicts

Immediate Action: Mark Short Term Separated Bikeways and Pedestrian Walkways

Short Term

- Collaborate with EMS, MSD, Bike Louisville
- Compile Baseline Performance Measurements
- Design Schematics for Campus Core separate bike and pedestrian lanes and facilities
- Inventory existing Core Campus relevant to LEED-ND guidelines
- Identify Funding Options
- Locate new bike racks to support future bikeway loops

Mid Term

- Design System of Bikeways, Walkways and Intermodal Depots
- Adapt site plans currently in design phase
- Design signs, racks, lighting, maps
- Grant Writing

Long Term

- Construction and Installation of bike and pedestrian infrastructure
- Continue seeking funding for future

Objective 1.2 Streets and Intersections: Improve walk-ability and bike-ability for campus commuters

Immediate Action: Work with E-Team Leaders on University District Street Designs

Short Term

- Baseline Performance Measurements
- Collaboration with Community advocates and stakeholders
- Inventory existing Streets per LEED-ND guidelines
- Document Walk-ability and Ride-ability Assessments to campus
- Ride-ability assessment from HSC to Belknap and from Shuttle lots

Mid Term

- Adapt current designs to Complete Streets/Road Diets
- Complete Streets Schematic Designs
- Compile Bike Boulevard data
- Focus Groups and Community Workshops
- Collaborate to reroute trucks

Long Term

- Construction of Complete Streets
- Conversion of University District streets to Complete Streets
- Continued Neighborhood Collaboration

Objective 1.3 On-campus bicycle amenities

Short Term

- Install 35 highest-priority bike racks on Belknap
- Install covered bike parking kiosks on Belknap
- Open basic campus bike shop on Belknap with volunteers and work-study
- Continue providing city bike maps and install bike map kiosks (with Paula Nye grant funds)

Mid Term

- Install 25 moderate priority bike racks on Belknap
- Install secure, indoor bike parking facilities on Belknap and HSC
- Open basic campus bike shop on HSC with volunteers and work-study.
- Install signage directing cyclists to safe routes and services.

Long Term

- Install 10 lowest priority bike racks on Belknap
- Install bike depot with shower facilities on Belknap (and Shelby if park-and-ride successful)

Objective 2.1 Support inter-modal commuting to Belknap, HSC, and Shelby

Immediate Action: Form Bike Boulevard Study Team; Study Shuttles from Belknap to HSC and Shelby; Create Bike-Share Task Force of Universities, Metro, non-profits, neighborhood groups, corporations

Short Term

- Promote use of new Belknap-HSC shuttle service
- Explore Bike Boulevard options and funding
- Establish bike-share system at Ekstrom Library
- Investigate Ticket to Ride Option between Belknap and HSC
- Investigate multi-bike transit vehicle
- Review projects in design/construction phase to insure bike connections to core campus
- Research Bike-Share Funding and Meet Contractors

Mid Term

- Baseline measurements of Belknap-HSC Shuttle needs
- Follow up assessment with Belknap-HSC Shuttle riders needs
- Research satellite transit nodes and depots, GIS
- Look into other local universities' transportation arrangements for suburban students
- Bike-share Grant Writing
- Solicit community support for bike-share

Long Term

- Identify and acquire satellite transit depot properties
- Compile follow up transit-mode data at regular intervals
- Follow-up analysis of bike-share program
- Write grants for future bike-share funding

Objective 2.2 Transportation Demand Management

Immediate Action: Design fee structure to support mixed mode incentives

Short Term

- Begin bicycle registrations, and enforcing abandoned bikes policy
- Order Bicycles for Single Occupant Vehicles (S.O.V). reduction/incentive, give-away program
- Designate impoundment procedures, responsibility and locations
- Increase number of priority parking spaces for hybrids and carpoolers
- Incentivize Ticket to Ride groups between Belknap and HSC

- Reduce parking pass fees for carpool groups
- Incentivize carpool and vanpool signups
- Explore eliminating UofL Parking subsidy and restructuring parking permit system to charge the full-cost of parking or market rates, using portion of new revenues to fund alternative incentive programs.

Midterm

- Launch bicycle give-a-way/incentive program
- Register free-bike recipients for study/follow-up purposes

Long Term

- Study VMT and SOV reduction strategies
- Study demand for suburban transit hubs for UofL Direct Shuttles
- Collect and analyze data on bike give-away

Objective 3.1 Bicycle Programs for Students

Short Term

- Offer bike P.E. class
- Look for funding sources for Bicycling for Louisville instructors
- Welcome Week signups and bicycle info distributions
- Explore adding bike ride to Discovery Walk during Welcome Week
- Encourage adding resident hall bike groups through Resident Student Association
- Add bike classes in Group Fitness options within existing weekly fee structure at SAC
- Explore intramural biking team options

Mid Term

- Create plan to meet all LEED-ND campus/student programming items
- Identify incentives to support the LEED items

Long Term

- Implement LEED student challenges and competitions

Objective 3.2 Bicycle Programs for Employees

Short Term

- Get Healthy Now team to add group bike training and social groups
- Get Healthy Now address HR issues for attire, safety, education

Mid Term

- Explore funding for bicycle fleet for campus police, maintenance, faculty/staff
- Get Healthy Now collect and analyze data on bicycle groups
- Evaluate bicycle social networking effectiveness

Long Term

- Supplement auto fleet with bicycle fleet and work-bikes

Objective 3.3 Analyze and market UofL transportation sustainability goals

Immediate Action: Create marketing clearinghouse for bicycling program info, (CSRC), (STARS), transportation data

Short Term

- Advertise biking opportunities through Campus Health News in bathrooms
- Add new bike group info on UofL communication channel
- Bring students, employee, neighbors, business groups together
- Get ideas from stakeholders
- Share UofL's Sustainability goals and current indicators with broader community
- Bring together Student Cycling Coalition, SGA, Partnership for a Green City,

Mid Term

- Explore creative local, green-recovery partnerships

Long Term

- Market efforts at state and national levels

Performance Measurements: 2010 -2020 Planning Prototype

	Performance Measure	Baseline data units/2010	Performance Target	Collection Frequency	Data Collection Responsibility
Objective 1.1 Core Campus: Provide separated and shared-use walkways and bike paths.	# Segments of Core Campus Delineated Bikeways # bike-ped collisions/yr	0 segments ? 	10% of total segments completed/year < 10 collisions	Annually	PDC
Objective 1.2 Streets and Intersections: Improve walk-ability and bike-ability for campus commuters	Core Campus Perimeter "Complete" Streets: # Segments # Intersections	Eastern Pkwy. Segment =1 Eastern Pkwy. @ 3rd Street Intersection =1	Improve (2) Street Segments annually Improve (2) Metro Intersections /yr.	Two Years Two Years	PDC
Objective 1.3 On-campus bicycle amenities	# New bike rack parking spots installed # New covered/protected bike parking spots # Maps distributed # Campus bike shop customers		100 spots/yr 15 spots/yr 1000 maps/yr 100 customers/yr	Annually Annually Annually Annually	PDC PDC Sustainability Council Sustainability Council
Objective 2.1 Support inter-modal commuting to Belknap, HSC, and Shelby	# of Direct Bus Routes to Belknap # Multi-bike buses for a.m. and p.m. routes # riders on Belknap to HSC Shuttle # intermodal depots $ from grants for Metro Bike Share	- 5 total (93, 96, 4, 2, 29) - 0 Multi-bike buses - 0 Shuttle riders - 1, Floyd St. Gar. - 0 Dollars	-Add direct routes based on survey demand data -Add 1 Multi-bike vehicle/ suburb Intermodal depot -Add # riders in first year - Depots at Shuttle stops - $ to fund Metro Bike Share system	Annually Annually Annually Annually Annually	Transportation and Safety Bike Share Team: UofL, JCC, Spalding, Metro, nonprofit, corporate
Objective 2.2 Transportation Demand Management	Percentage commuter mode-shares (Faculty %, Student %)	Walk (3,17), Bike (2,4), Bus (6,6), Carpool (7,5), Drop Off (3,3), S.O.V. (79, 65)	-Decrease S.O.V. mode share by 3% annually	Survey Every Two Years	Transportation and Safety, Sustainability Council
Objective 3.1 Biking Programs for Students	% participation in student bike programs	2010: interactions per student	2% increase/year	Annually	Campus Health, P.E., SGA, RSA, Group Fitness
Objective 3.2 Bicycling Programs for Employees	% participation in employee bike programs	2010: interactions per employee	2% increase/year	Annually	Get Healthy Now Team

Objective 3.3 Analyze and Market UofL Transportation Sustainability Goals	Sustainable Transportation indicators: STARS, GHG/commuter	2011 STARS: Op15=1.4, Op16=0.64 2009 GHG per commuter =	STARS = 20% point improvement GHG = 7% reduction over 1990 by 2012	Two Years	Sustainability Council

Scorecard of Policy Outcomes (to monitor future outcomes)

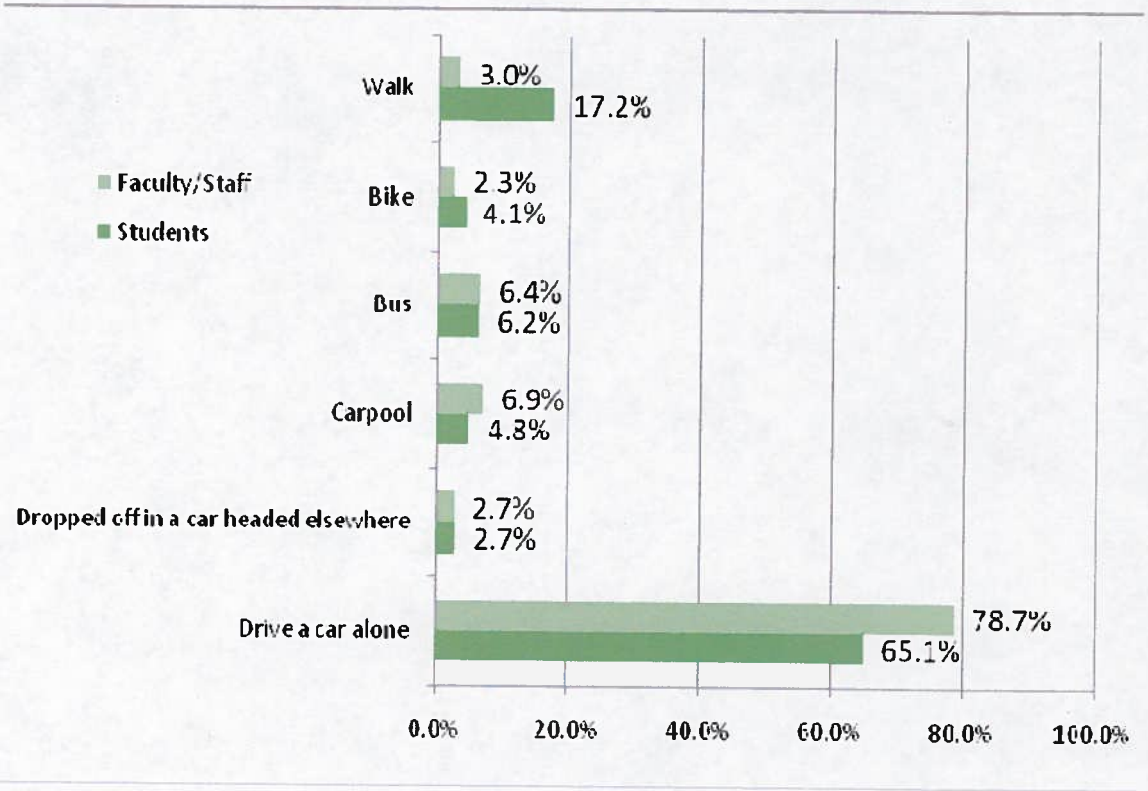
Policy Outcomes	Policy Alternative	Policy Alternative	Policy Alternative	Policy Alternative	Policy Alternative	Policy Alternative	Policy Alternative
	Belknap, Educational Core, bike and pedestrian plan	Belknap Shared-use Pathway, Linear Park	Belknap, perimeter roads and intersection standards	Belknap-HSC TARC route revisions	Bike Share Plan Collaboration	Shelby Campus, Suburban Depots	Status Quo; no alternative transportation plan.
Vehicle Miles Traveled to Campus, VMT							
# Single Occupant Vehicles to Campus, SOV							
Traffic Counts within 1.5 mile radius, Total							
Bike-car collisions within 1 mile radius of campuses							
Pedestrian-car collisions within 1 mile of campuses							
Air Pollution Levels							
Truck travel distances							
Traffic Calming devices, count							

Appendix A: UofL Transportation Survey Results

Three fourths of the responses to the UofL's March 2010 Alternative Transportation Survey were from faculty and one quarter were from students. Over two thirds of respondents said that they usually go to Belknap Campus, about a third usually go to Health Sciences Campus, and just one percent commute most often to Shelby Campus. When the survey was conducted UofL had 6,174 full or part time faculty and staff and had 21,761 full or part time students.

Current Modes of Commuting to Campus:

- 3/4 of respondents say they travel to campus in car alone (Single Occupant Vehicle, SOV)
- **2% employees, 4% students bike**
- 3% employees, 17% students walk
- 6% take the bus
- 7% employees, 5% students carpool
- 3% get dropped off
- 22 minutes = average student travel time
- 26 minutes = average faculty/staff travel time
- 3/4 of respondents have a UofL parking pass



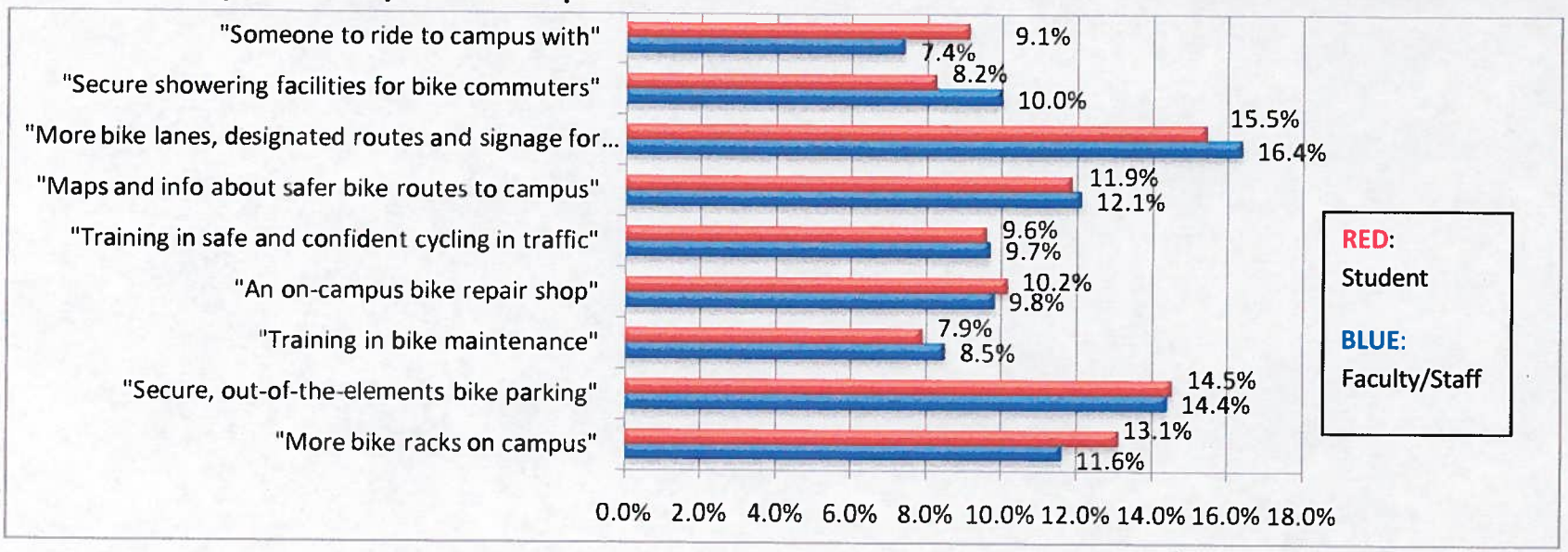
Bicycle Commuting:

University of Louisville's 2010 alternative transportation survey revealed that 68% of those living 10 minutes or less from campus drive alone (or 3,700 drivers). Providing parking facilities for commuters is a very significant expense to the university, and it would be a worthwhile investment to provide attractive incentives to encourage alternative modes. Bicycling could be a viable option for many of those living within five miles of campus.

The top two improvements that students and faculty say will make them bike to campus more often:

- Designated Bike Lanes, Routes and Signage (right)
- Secure Bike Parking (far right)

What would make you more likely to bike to campus?



In addition to designated bike routes and bike parking for commuting, students want more bike racks on campus, maps for safer bike routes, on campus bike repair shop and maintenance training (ranked in 3rd -6th choices, consecutively). For faculty, maps for safer routes, more bike racks on campus, maintenance training, and campus bike repair were 3rd-6th in importance. The majority in both groups say they don't care whether they ride on one way or two way streets.

More bike racks are being installed at UofL to meet increased demand.

Off road bicycle pathways provide a less threatening option for most riders.

Another off road option which may be perceived as a being safer by less experienced riders is the shared use path with separate bike and pedestrian zones, differentiated by surface design, color, and/or pavement markings.

Free Bike Program:

Interest in a Free Bike Program in which a free bike and helmet would be given to anyone willing to forgo a parking permit for at least two years:

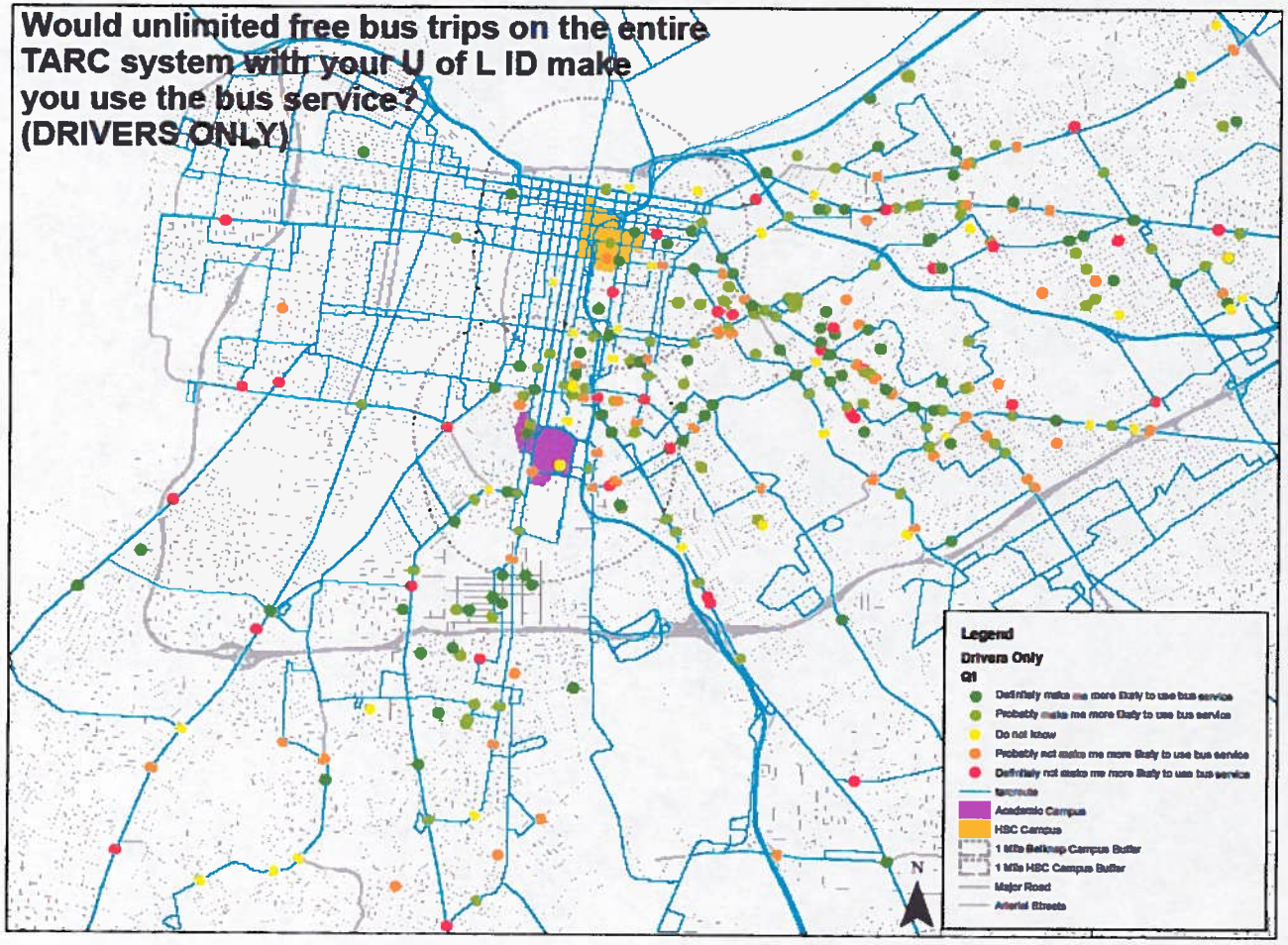
- 50% of students interested
- 25% of faculty/staff interested

Both faculty and students stated they will be more likely to participate if they receive a voucher to pick out their own bike.

- About 20% of students and 8% of employees felt that the free bike program was the most important transportation alternative incentive program UofL could provide.

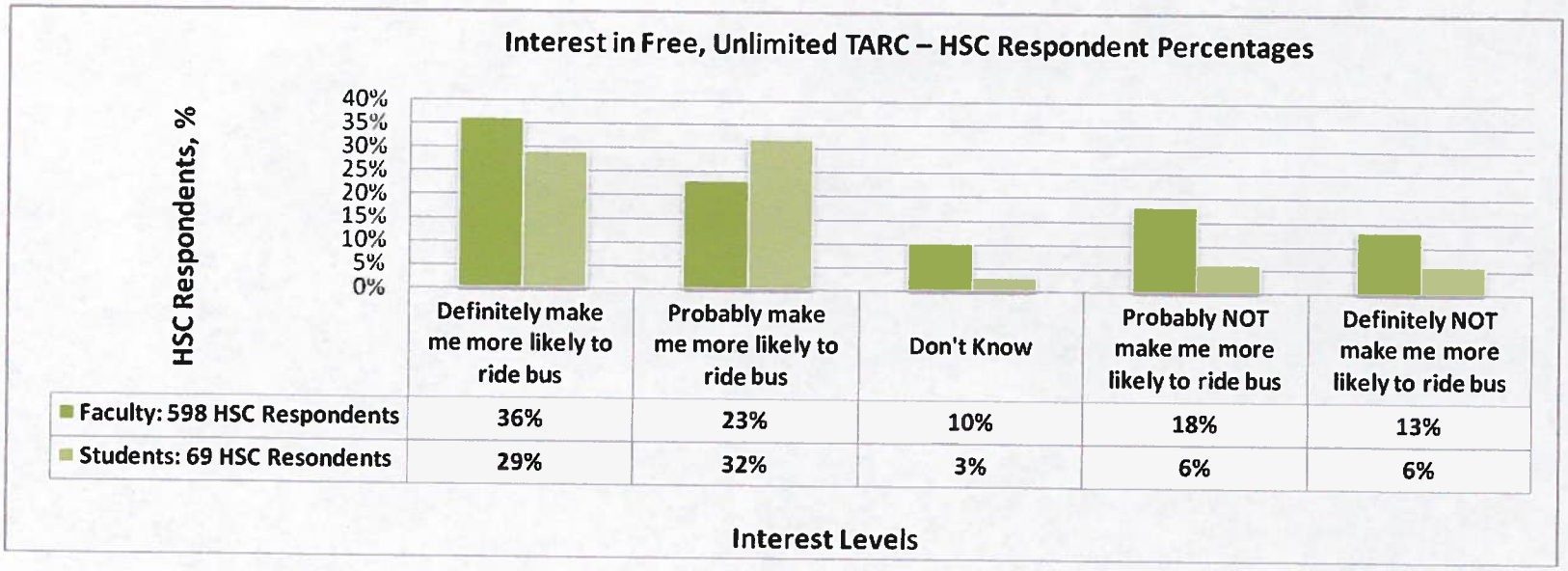
Bus Commutes:

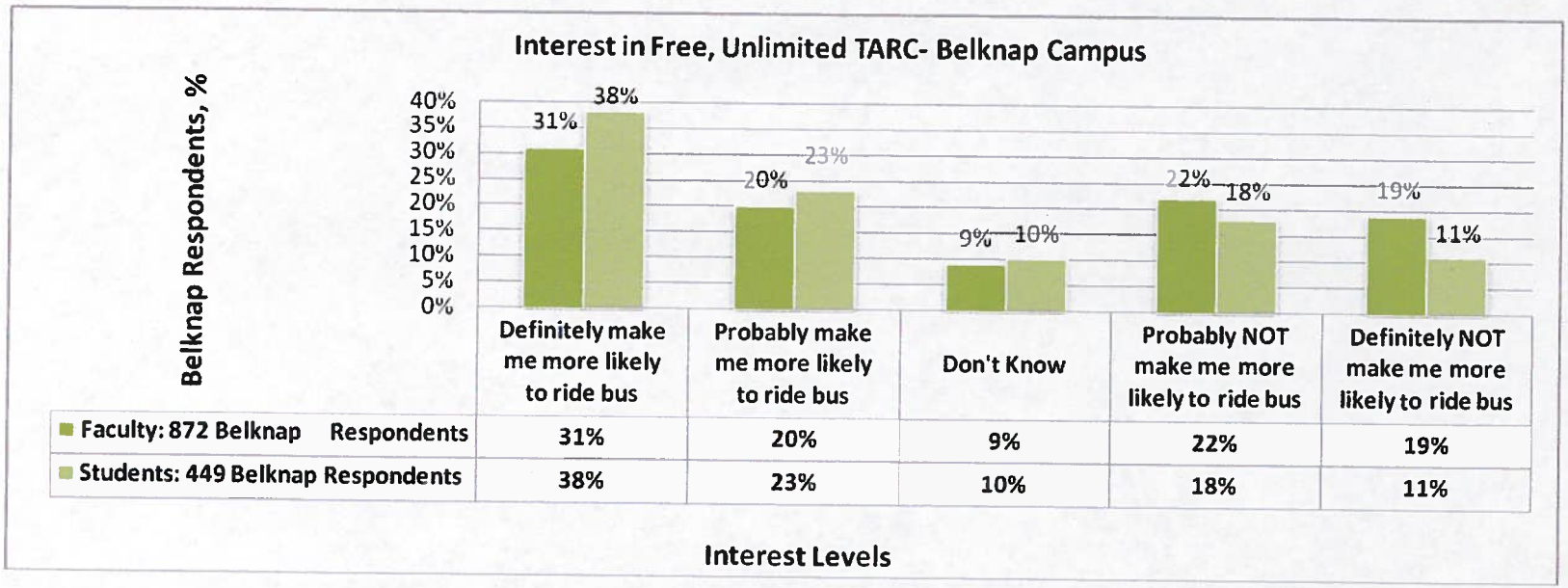
Over half of students and faculty who currently drive to campuses agreed that they would be potentially interested in getting to and from campus by bus if the university provided unlimited, "fare-free" bus trips on TARC. The university currently provides this fare-free service on the entire TARC system to UofL students, faculty and staff.



Dotted lines around the Belknap and HSC campuses designate a one-mile radius to each campus.

Green dots indicate areas with UofL car-commuters who are definitely or probably interested in fare-free bus trips with their UofL ID card.


Interest in Free, Unlimited TARC – HSC Respondent Percentages
HSC Respondents, %
40%
35%
30%
25%
20%
15%
10%
5%
0%
Definitely make me more likely to ride bus
Probably make me more likely to ride bus
Don't Know
Probably NOT make me more likely to ride bus
Definitely NOT make me more likely to ride bus
Faculty: 598 HSC Respondents
36%
23%
10%
18%
13%
Students: 69 HSC Resondents
29%
32%
3%
6%
6%
Interest Levels


Interest in Free, Unlimited TARC- Belknap Campus
Belknap Respondents, %
40%
35%
30%
25%
20%
15%
10%
5%
0%
31%
38%
20%
23%
9%
10%
22%
18%
19%
11%
Definitely make me more likely to ride bus
Probably make me more likely to ride bus
Don't Know
Probably NOT make me more likely to ride bus
Definitely NOT make me more likely to ride bus
Faculty: 872 Belknap Respondents
31%
20%
9%
22%
19%
Students: 449 Belknap Respondents
38%
23%
10%
18%
11%
Interest Levels

Bus Commutes:

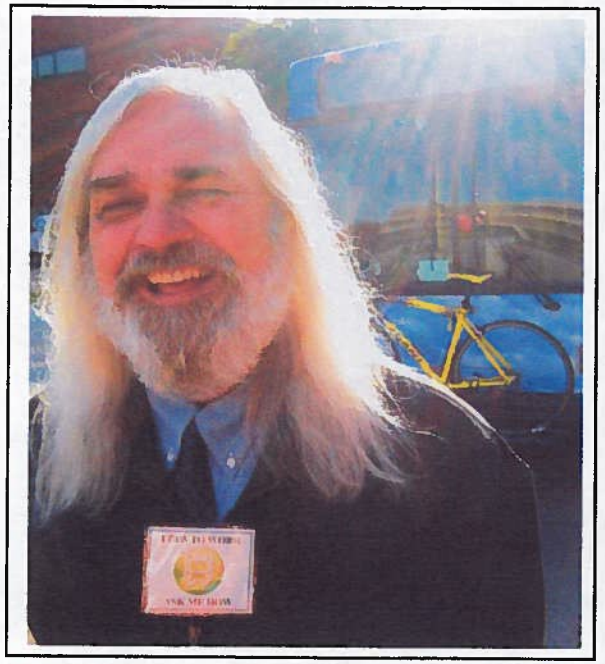
Top 3 Bus-service requests, to make students and faculty bus to campus more often:

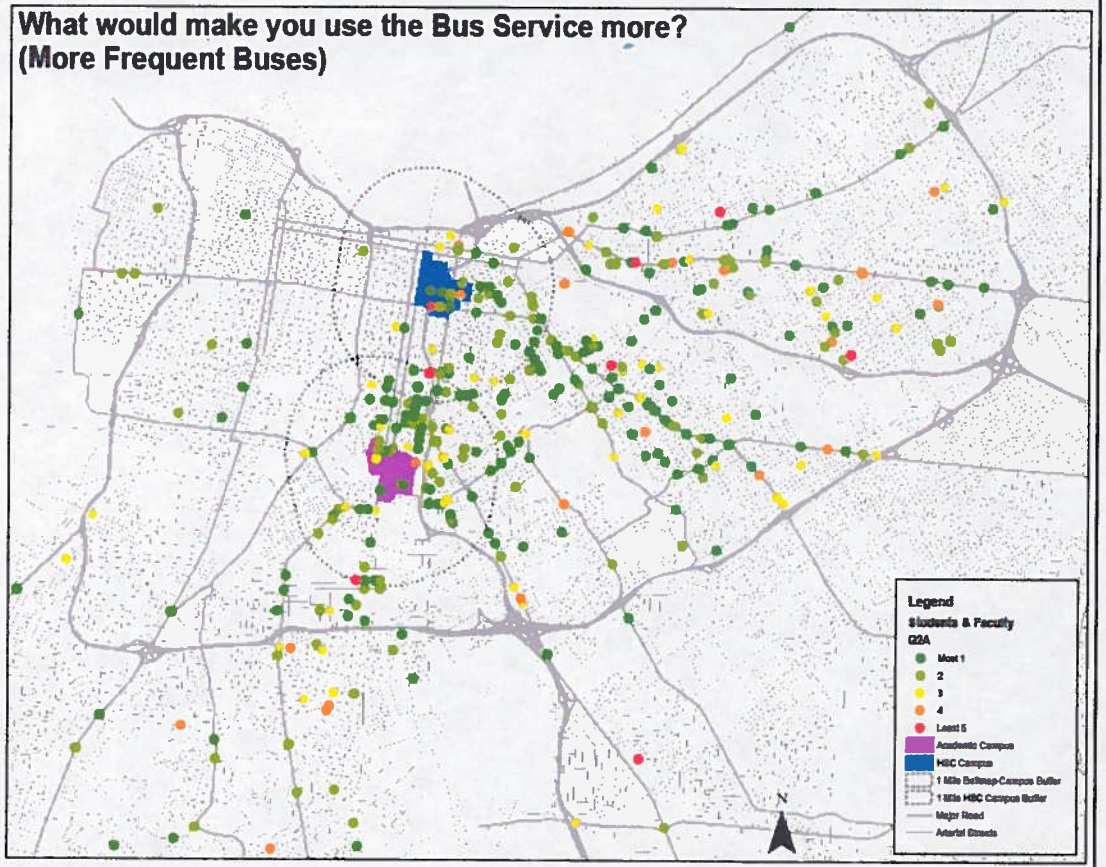
28% Direct routes to campus/no transfers

27% More frequent buses/less waiting

20% More bus routes

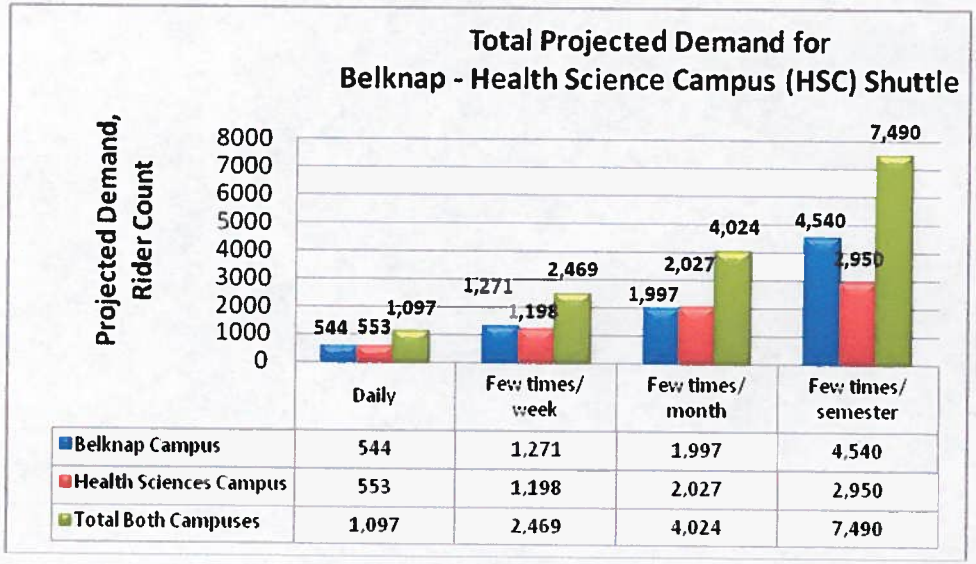
Faculty and students placed less importance on additional earlier or later bus service.

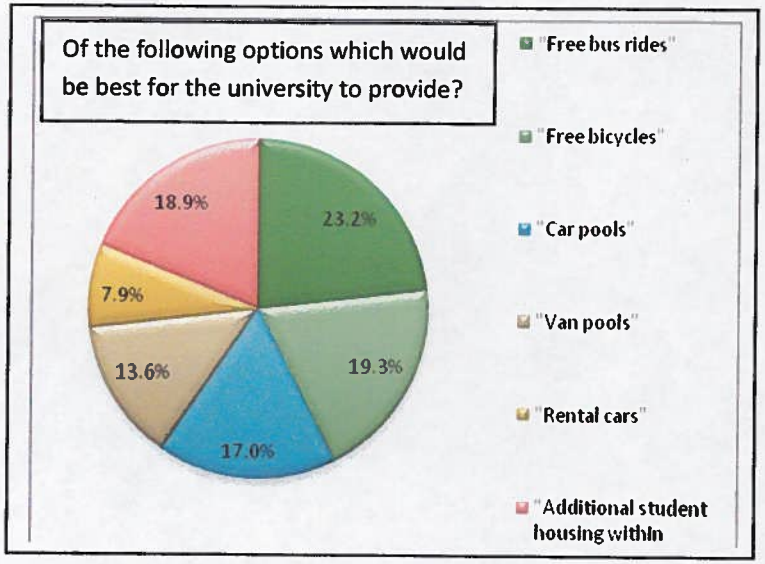




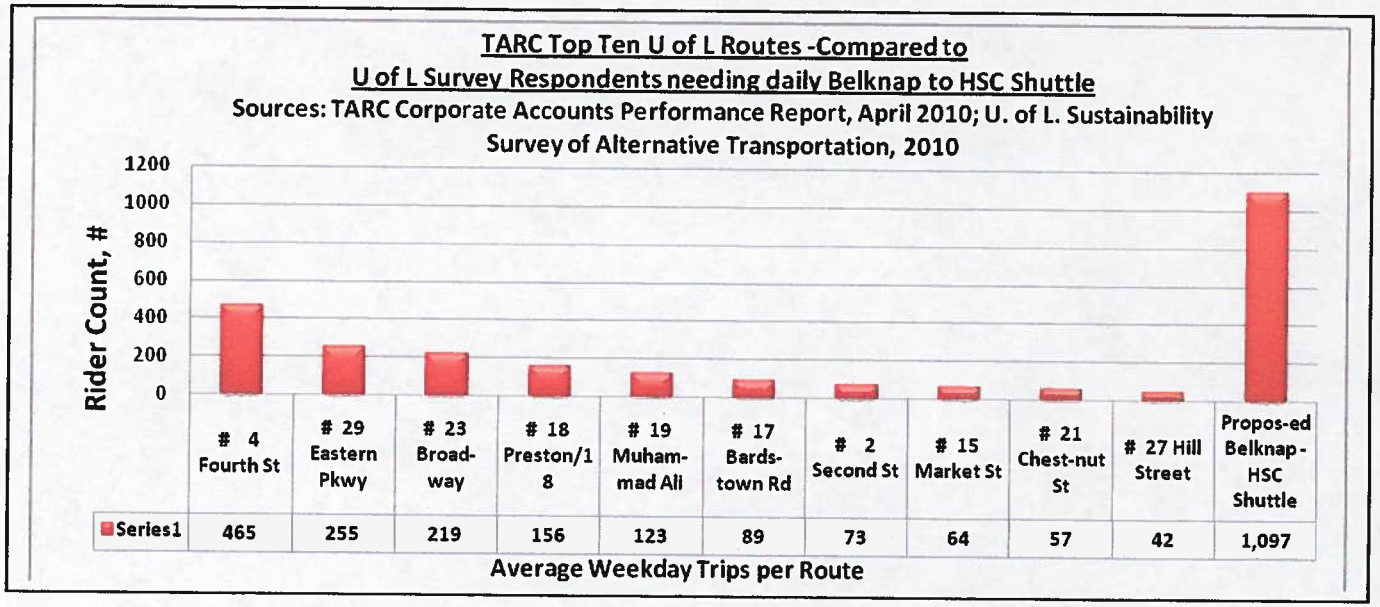
Responses from within one-mile walk zones from Belknap and HSC campuses suggest that additional university shuttle or TARC service may increase bus ridership. Strong responses from the Southern Parkway area, Bardstown Road Corridor, U.S. 60 also call for more frequent bus service. Responses from outside of Watterson Expressway are not included on map for all areas.

Belknap to HSC Bus Service:





Over 3500 students and faculty are projected to use the new shuttle service between Belknap and Health Sciences campus either once a day or up to a few times a week.



Carpool/Vanpool/Rental Car Interest:

Survey responses indicate that many in the UofL community are interested in options which could reduce their personal auto use as the sole means of transportation to campuses. Approximately 40% to 50% of students and faculty/staff are interested in university provided online carpool matching and discounted or priority parking permits to those who register their carpool. Over 1/3 of students and faculty are interested in university established vanpools with daily set schedules and limited pickup and drop off points. Close to 1/5 of students and faculty are interested in university provided rental cars.

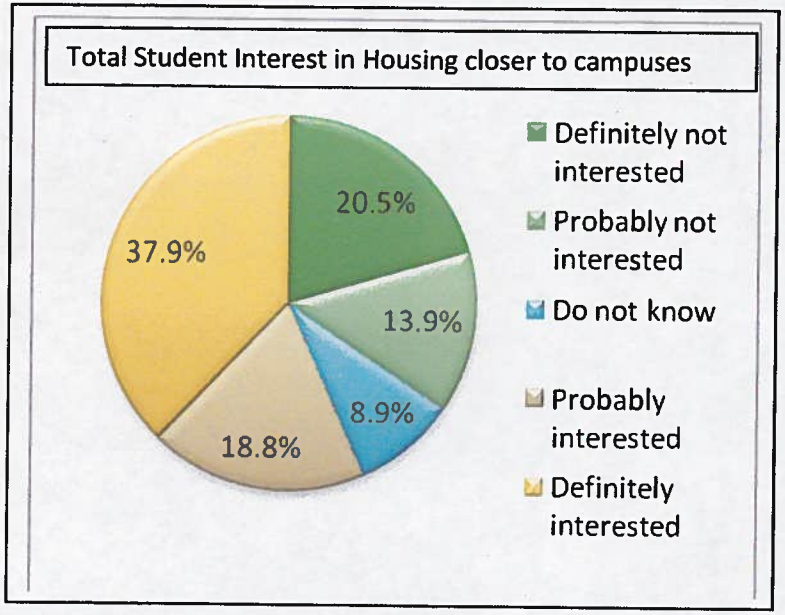
2010 UofL Alternative Transportation Survey Data	University carpool matching and discounted priority carpool parking permits for registered carpools		University vanpools with set daily schedules, limited pick up and drop off points with monthly fee		University rental cars on campus at low hourly rate	
	Interested, %	Projected #	Interested, %	Projected #	Interested, %	Projected #
Faculty/Staff	41%	2,531	37%	2,284	19%	1173
Students	52%	11,315	40%	8,704	18%	3,916

FACULTY:
The following percentage chose either carpool, vanpool or rental cars as the **most important thing** that the university could do to reduce car commutes to campuses:

- 15% (employees) Carpools
- 9% (employees) Vanpools
- 1% (employees) Rental Cars

Housing Interests Closer to Campuses:

Student Commute time	Students Definitely or Probably Interested in Housing, %	Total Student Commuters, #	Students Commute by car alone, %	Students (SOV) Definitely or Probably Interested, #
10 min./less	67	4352	18	783
11-20 min.	50	6963	31	2158
21-30 min.	45	6310	32	2019
31-40 min.	61	2611	13	339
41-60 min.	44	1088	6	65
60 plus	80	217	1	2



FACULTY:

- 33% (2,037 employees) "definitely or probably interested" in university provided financial incentives to purchase homes near campus in order to be able to walk to work.
- 17% (1,049 employees) said that financial incentives to purchase housing near campus is most important thing university could do to reduce commutes.

STUDENTS:

- 58% (12,621 students) "definitely or probably interested" in affordable housing in walking distance of campus.
- 19% (4,134 students) say housing in walking distance of campus most important thing the university could provide to reduce driving.

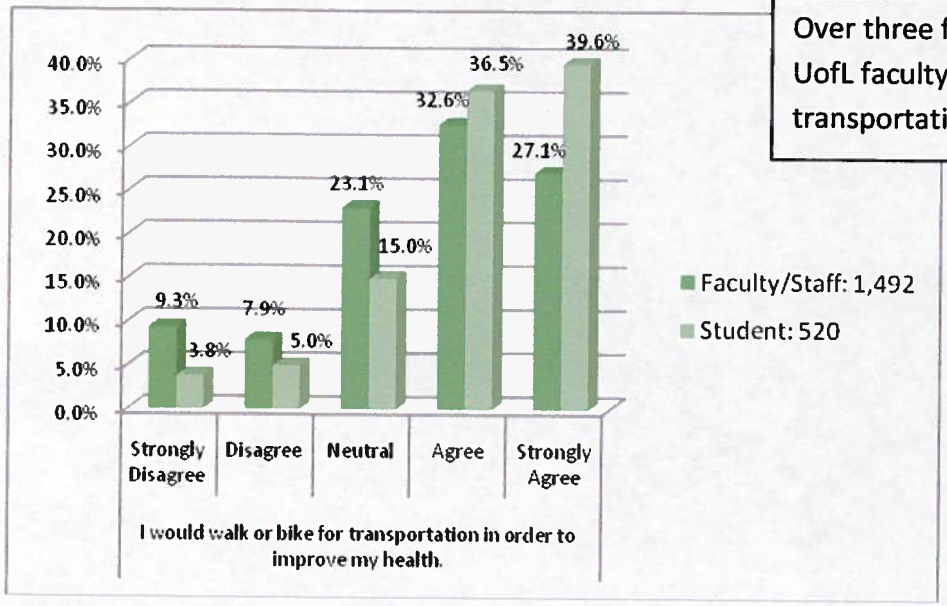
Economic Interests:

- Students said they would consider alternative transportation to and from campus when gas reaches four dollars a gallon. For faculty and staff the price would be about 5 dollars per gallon.
- Students would consider moving closer to campus when gas reaches five dollars per gallon. Faculty and staff would consider moving closer to campus when gas reaches 10 dollars per gallon.
- Students are willing to pay an additional 80 dollars annually for their UofL parking pass before they consider alternative transportation. Faculty and staff are willing to pay 160 dollars more for their UofL parking pass before the will consider alternative transport to campus.

S.O.V. Student commuters interested in walking-distance university housing:

- 5,366 students probably/definitely interested in more housing (survey)
- Annual cost to own/maintain car = $8,000 (AAA Kentucky estimates)
- 5,366 cars (x) $8,000 = $42,928,000 Total Annual Potential Savings

Health Incentives:



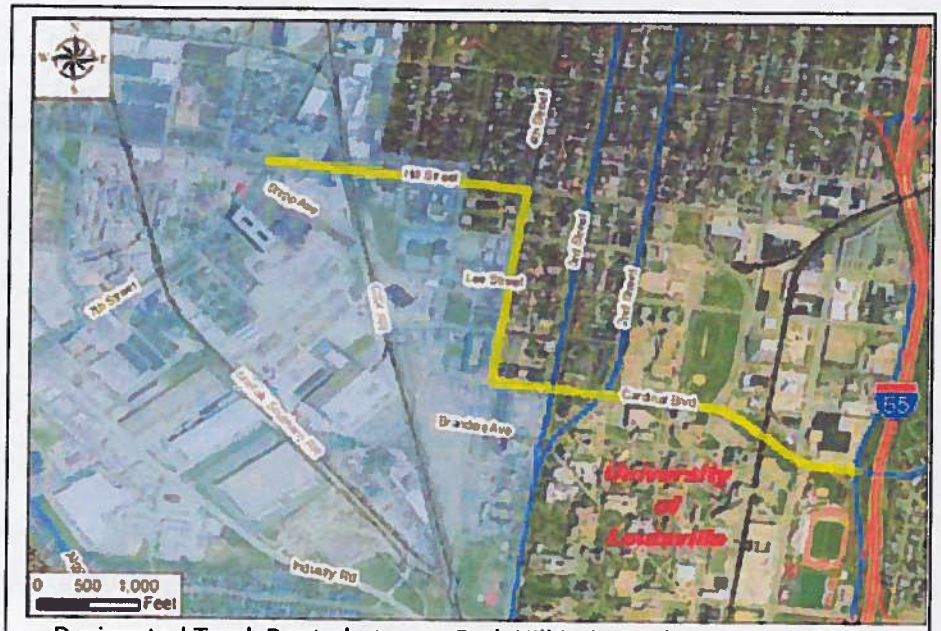
Over three fourths of UofL students and over half of UofL faculty and staff agree that they would bike for transportation in order to improve their health.

Calories burned per hour of cycling	140 lbs	195 lbs
Bicycling, 10-11.9 mph, light effort	381	531
Bicycling, 12-13.9 mph, moderate effort	508	708
Bicycling, 14-15.9 mph, vigorous effort	636	885
Bicycling, 16-19 mph, very fast, racing	763	1062
Bicycling, >20 mph, racing	1017	1416

Appendix B: Traffic Counts and Truck Routes around Belknap

Truck route traffic and cut-through traffic to I-65 on streets around Belknap campus add to the high traffic counts and will need to be addressed in order for the campus and surrounding residential neighborhoods to thrive in the future. The Kentucky Transportation Cabinet documents the following daily traffic counts around the campus, mapped on the following page:

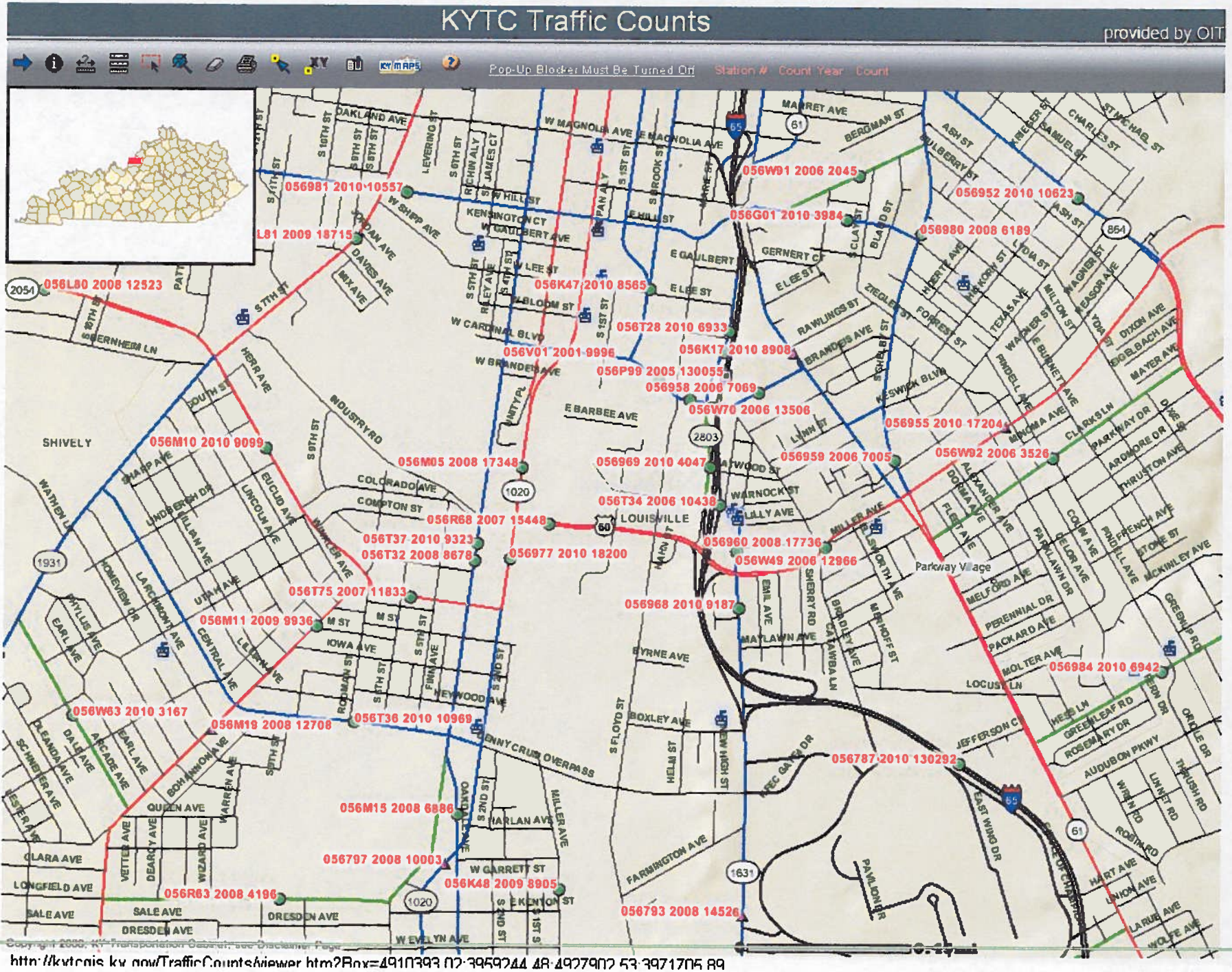
- 3rd Street at the Law School – 17,348;
- 3rd Street at Engineering Graphics building – 21,627;
- Brandeis Street between Brook and Floyd – 19,735;
- Brandeis Street between Bradley and Preston – 7,069;
- Crittenden Drive at Atwood – 12,966.



Designated Truck Route between Park Hill industrial corridor and I-65.

What is significant to notice is that the 7th Street to 9th Street corridor, which provides four-lane truck access to the interstates through mostly industrial areas, has lower traffic counts than the Belknap campus in several spots (e.g. 7th at St. Catherine – 3,671; 9th Street at Breckinridge – 14,239; 9th Street one block from the I-64 ramp – 17,632). This occurs due to lack of proper access to I-65 Corridor. The trucks are still being directed through the campus despite having alternate routes.

Also significant is that 7th Street just south of Shipp (just before trucks turn east to cut over to Cardinal for I-65) has a count of 16,855, much higher than 7th just north of this point, indicating that truck traffic from the south is indeed cutting across the


KYTC Traffic Counts
provided by OIT
Pop-Up Blocker Must Be Turned Off
Station #
Count Year
Count
056981 2010 10557
L81 2009 18715
056L80 2008 12523
056M10 2010 9099
056M05 2008 17348
056R68 2007 15448
056T37 2010 9323
056T32 2008 8678
056T75 2007 11833
056M11 2009 9936
056W63 2010 3167
056M19 2008 12708
056T36 2010 10969
056M15 2008 6886
056797 2008 10003
056R63 2008 4196
056K48 2009 8905
056793 2008 14526
056787 2010 130292
056984 2010 6942
056W01 2006 2045
056G01 2010 3984
056952 2010 10623
056980 2008 6189
056K47 2010 8565
056T28 2010 6933
056V01 2001 9996
056K17 2010 8908
056P99 2005 130055
056958 2006 7069
056W70 2006 13506
056955 2010 17204
056W02 2006 3526
056969 2010 4047
056959 2006 7005
056T34 2006 10438
056960 2008 17736
056W49 2006 12966
056977 2010 18200
056968 2010 9187
SHIVELY
LOUISVILLE
Parkway Village
W MAGNOLIA AVE
E MAGNOLIA AVE
OAKLAND AVE
W SHIPP AVE
W HILL ST
E HILL ST
W GAULBERT AVE
E GAULBERT
W LEE ST
E LEE ST
W BLOOM ST
W CARDINAL BLVD
W BRANDEIS AVE
E BARBEE AVE
SOUTH ST
INDUSTRY RD
COLORADO AVE
COMPTON ST
IOWA AVE
M ST
HEYWOOD AVE
BYRNE AVE
BOXLEY AVE
FARMINGTON AVE
W GARRETT ST
E KENTON ST
W EVELYN AVE
HARLAN AVE
QUEEN AVE
DRESDEN AVE
SALE AVE
LONGFIELD AVE
CLARA AVE
MARRET AVE
BERGMAN ST
ASH ST
MULBERRY ST
GERNERT CT
ELEE ST
RAWLINGS ST
BRANDEIS AVE
KESWICK BLVD
LYNN ST
ATWOOD ST
WARNOCK ST
LILLY AVE
MILLER AVE
SHERRY RD
MATLAWN AVE
MELFORD AVE
PERENNIAL DR
PACKARD AVE
MOLTER AVE
LOCUST LN
GREENLEAF RD
ROSEMARY DR
AUDUBON PKWY
JEFFERSON CT
EAST WIND DR
PAVILION PL
HART AVE
LARUE AVE
WOLFE AVE
ORIOLE DR
THRUSH RD
LINNET RD
WREN RD
ROBIN RD
GREENUP RD
MCKINLEY AVE
STONE ST
PINEHILL AVE
FINCH FRENCH AVE
CORA AVE
FLORA AVE
PARKLAWN DR
ALEXANDER AVE
DORMAN AVE
FLEET AVE
MIKOMA AVE
CLARKS LN
PARKWAY DR
ARDMORE DR
THRUSTON AVE
MAYER AVE
DIXON AVE
BOLBACH AVE
WAGNER ST
MILTON ST
TEXAS AVE
FORREST ST
ZIEGLER ST
HERTZ AVE
HICKORY ST
LYDIA ST
REASOR AVE
E BURNETT AVE
PRIDELL DR
S 7TH ST
S 6TH ST
S 5TH ST
S 4TH ST
S 3RD ST
S 2ND ST
S 1ST ST
S FLOYD ST
S BROOK ST
S CLAY ST
S HANCOCK ST
S SHIPP AVE
S 10TH ST
S 9TH ST
S 8TH ST
LEVERING ST
REHM ALY
JAMES CT
DUPAN ALY
MAIN ST
MARKET ST
BLAND ST
KENSINGTON CT
VANTY PL
HERR AVE
DAVIES AVE
MIX AVE
DUPAN AVE
OBERNHEIM LN
WATHEN LN
SHARP AVE
LINDBERGH DR
GILLHAVE
EUCLID AVE
LINCOLN AVE
RIDGECREST AVE
HOMEVIEW DR
LARCHMONT AVE
UTAH AVE
CENTRAL AVE
LEE AVE
ROBMAN ST
FINN AVE
PHYLLIS AVE
EARL AVE
DALE AVE
ARCADE AVE
OLEANDA AVE
SCHNEIDER AVE
NESTER AVE
BOHANNON AVE
WARREN AVE
VETTER AVE
DEARCY AVE
WIZARD AVE
CLEVELAND AVE
MILLER AVE
PENNY CRUSE OVERPASS
HELM ST
NEW HIGH ST
REC CAMP DR
CATAWBA LN
BRADLEY AVE
MERHOFF ST
ENIL AVE
1931
1020
1631
2051
2803
864
61
60
65
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http://kytcgis.ky.gov/TrafficCounts/viewer.htm?Box=4910393.02;3959244.48;4927902.53;3971705.89

campus to I-65 to go north rather than staying on 7th, which now becomes 9th, to connect via the 9th Street ramps. This truck traffic (which is following multiple existing signs that lead east on Shipp to south on 4th Street and then left on Cardinal) passes right past the new Scholar house for women with young children, intersects the campus exactly where pedestrian counts are skyrocketing and creates an increasingly dangerous scenario where pedestrians and bicyclist are already vulnerable.

Concerning connections to I-65 from the west, the Hill Street connection to the interstate from 7th Street also has lower traffic counts than campus connections to I-65, as follows: Hill Street just east of 7th – 11,599; Hill at I-65 - 10,264. Oak Street connections to I-65 have the following traffic counts: Oak at 7th – 7,429; Oak between 4th and Brook - 9,773.

Trucks from the Park Hill corridor are currently directed to pass immediately by campus. Altering this route or installing traffic calming devices on campus perimeter roads to encourage trucks to connect to interstates from 7th Street to 9th Street ramps (north) or to the Watterson (south).

These counts indicate that surrounding roads designed to handle traffic leading to the interstates are not taking the load off of the Belknap campus to the extent that they could be.

Creating the safest possible streets within the expanding campus footprint brings the opportunity for the university to work with city leaders to relocate the truck route off of campus and make construction of traffic calming devices at campus intersections and roads a top priority.

Slowing traffic on campus roadways may encourage cut-through traffic to seek different routes, away from University pedestrians and bicyclists who have no other choice.

The truck route at 4th and Cardinal passes between educational core campus and west campus student housing areas.

Truck route on Cardinal Blvd. to Brandeis

Appendix C: Physical Design Elements

Belknap Campus: Bike "Gateways"

Louisville billboard sign is at a scale readable by passing interstate traffic on I-65. Sign in foreground is at a scale readable by drivers on local streets.

Bridge overpasses serve as gateways in several areas at scales defined by interstate highways and railroads.

Key for diagrams (see following pages):

Bike Gateway to Belknap

Way-finding Signage

Yield to Pedestrians Signage

Dismount Zone Signage

Bike-Only lane surface or markings

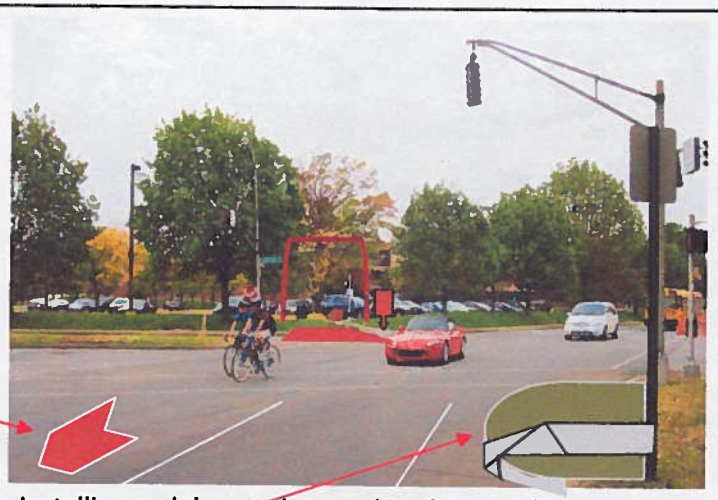
Pedestrian Only/Dismount Zone surface or markings

Existing entry points to campus are marked by signage and structures at scales designed to be read while passing in high speed motorized vehicles.

Bike Gateways:
Human-scale bike and pedestrian gateways would clearly define where, how and when cyclists and pedestrians are to enter the campus.

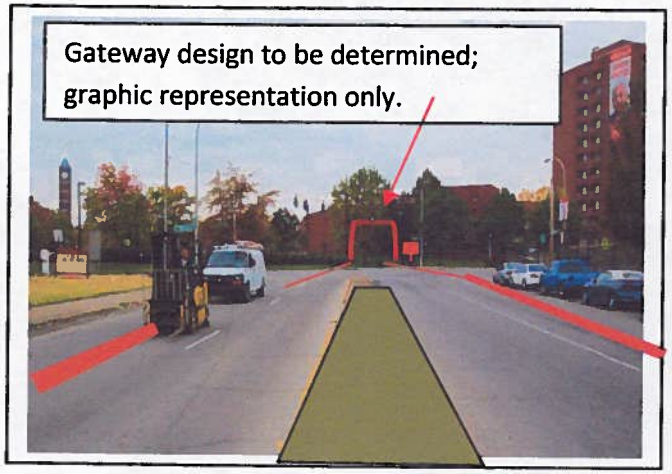
The entry gateway to the band field is large enough to be seen from a distance but at a more pedestrian scale than some of the larger campus gateways.

Left: Music School beyond 2nd street Bike Gateway; Buffered Bike Lanes on Cardinal. Right: Priority Bike Lane with Sharrows on 2nd Street. Traffic calming pedestrian curb bump

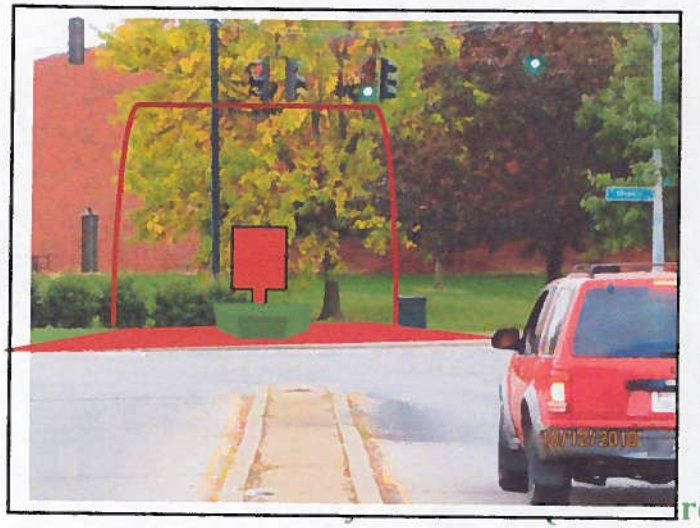


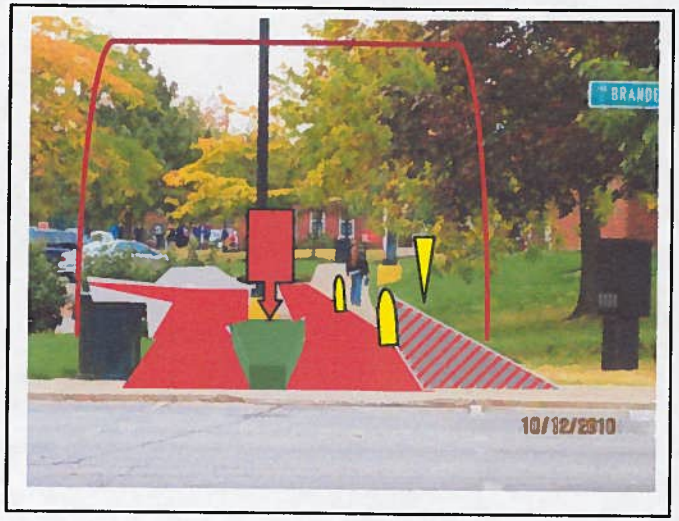
Installing curb bumps into parking lanes reduces crossing distances (and times) for pedestrians; increases safety.

Brook Street Bike Gateway; Brook Street Bike Boulevard Extension to Cardinal



Left: Brook Street looking south to Cardinal Boulevard and Brook Bike Gateway to campus. Priority Bike Lanes in right lane both directions. Widen median to reduce lane widths and calm traffic on Brook.
Right: Bikes and pedestrians currently share walkway from Cardinal at Brook. This is a major entry point to campus for bikes and walkers.
Below, left and right:
RED: Bike-only pathway.
Gray/Red stripe: Pedestrian-only surface and Bike Dismount zone.
Note: Separate surface treatments to be determined; graphic representation only.





Left: Existing campus streets and parking areas marked for Educational Core Bike Loop.

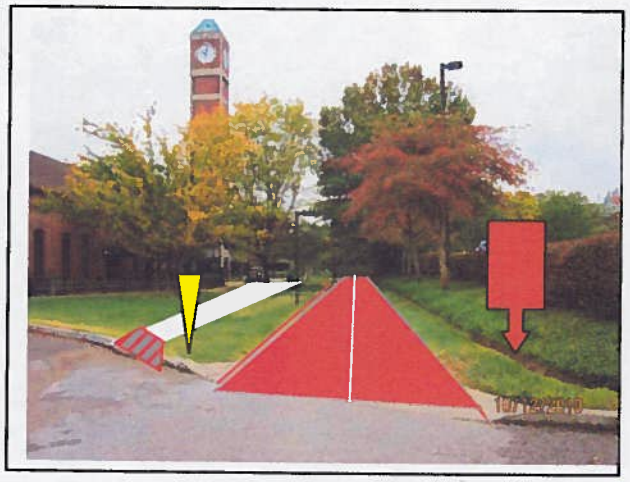
Bottom Left: Bike Lane markings to guide bikes and indicate that bikes belong.

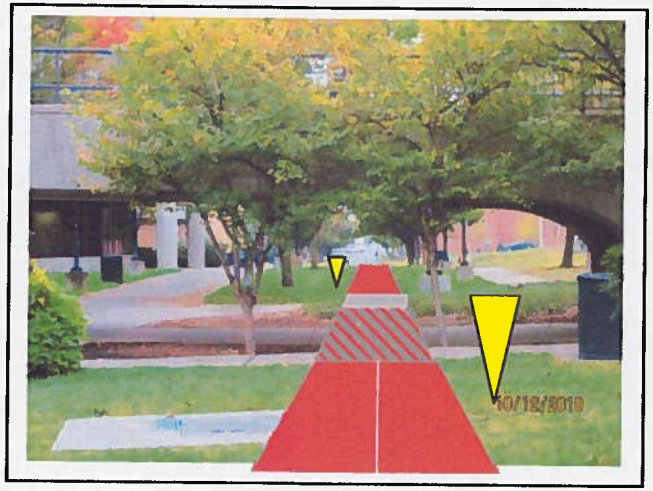
Top Right: Existing side walk from Alumni parking lot to SAC to become bike only pathway. New, pedestrian only pervious concrete surface and signage.

Bottom right: New pervious surface Bike-only Pathway to SAC and beyond to continue Brook Bike Boulevard on campus.

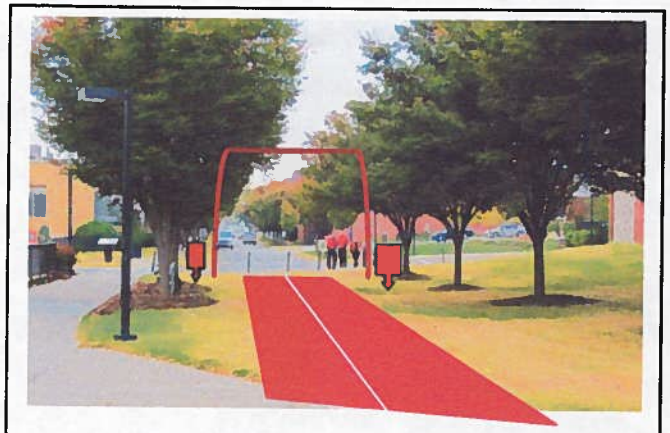
Gray/Red Stripe: Yield to Pedestrians.

Yellow Triangle: Yield to Pedestrian Signage.





Brook Bike-Connector Gateway; Educational Core Loop: Brook-Campus Bike Boulevard



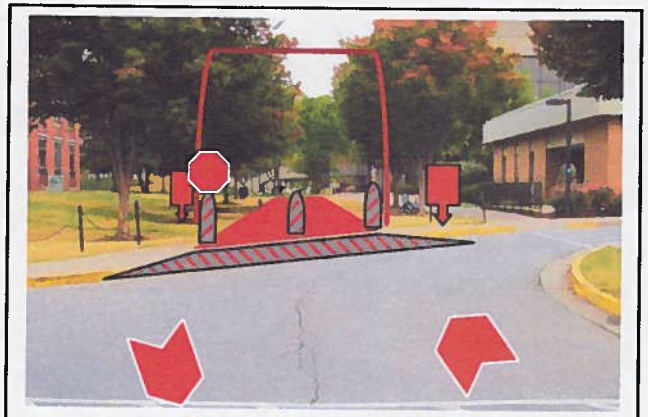
Brook Bike Connector Gateway looking south.

Left: Pervious surface Bike Only Pathway at Brook Connector Bike Gateway.

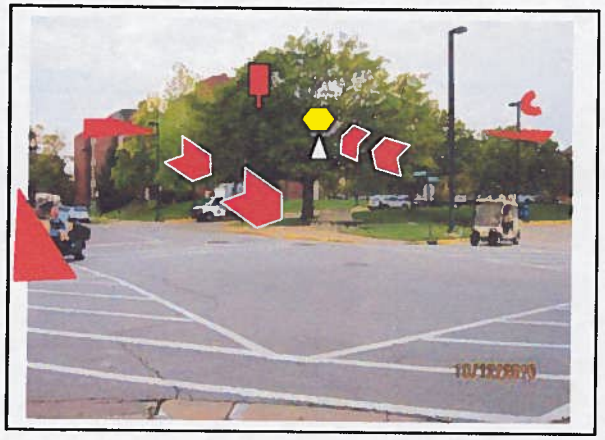
Right: Existing walkway to right of Bikeway. Signage for bikes to yield to pedestrians and autos. Bike Sharrows on Brook continue Bike Boulevard on campus to South Campus Bike Tunnel.

Bottom Left: Bike Boxes at intersections indicate that cyclists have priority; arrow markings guide bikes past pedestrian walkways to Warnock Bike Gateway on roundabout.

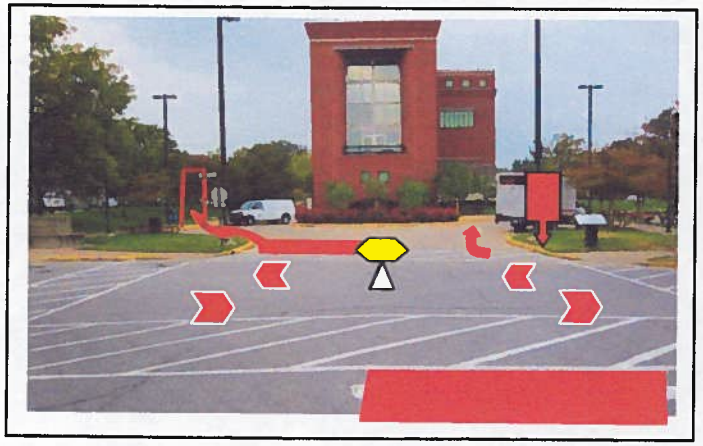
Bottom Right: Bike boulevard signage and sharrows at Brook and Warnock intersection.



Brook Bike Connector Gateway looking north.



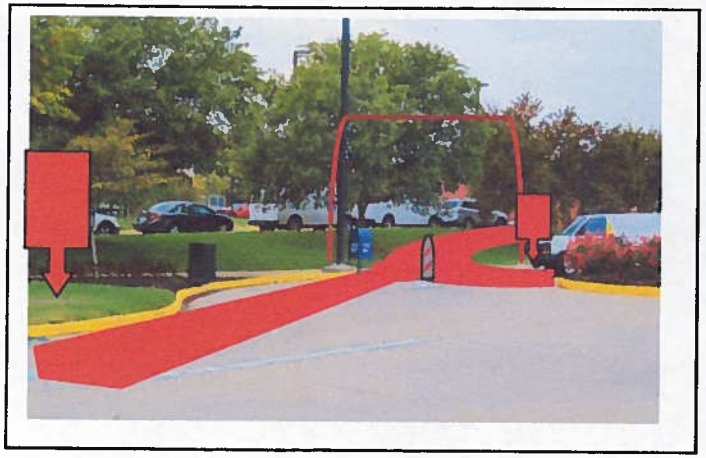
Warnock Street Bike Gateway



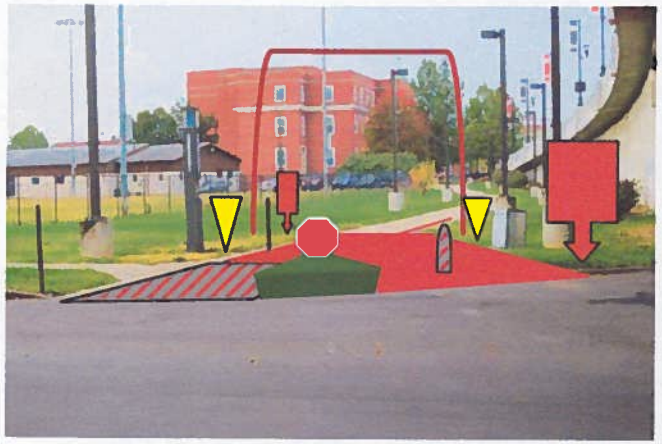
Left: Warnock Bike Gateway from roundabout in background; sharrows and bike boulevard signage at intersection.

Right: Surface treatment and signage to designate Pedestrian Only/Dismount Zone on walk from roundabout past Crawford Gym towards Library Quad.

Bottom Left: Warnock Bike Gateway from roundabout connects to sidewalk from Chemistry parking lot to Miller IT; continuing the Educ. Core Bike Loop (beyond right).



Educational Core Loop: Speed School Mixed-use Path; Natural Sciences Mixed-use Pathway (bike/walk)



Mixed-use (bike/walk) pathway from Brook west to Speed School and traffic light; provides easy access to eastbound bike lane on Eastern Parkway.

Mixed-use pathway north of bridge (foreground) leads to Natural Science Building; continuation of Educ. Core Loop.

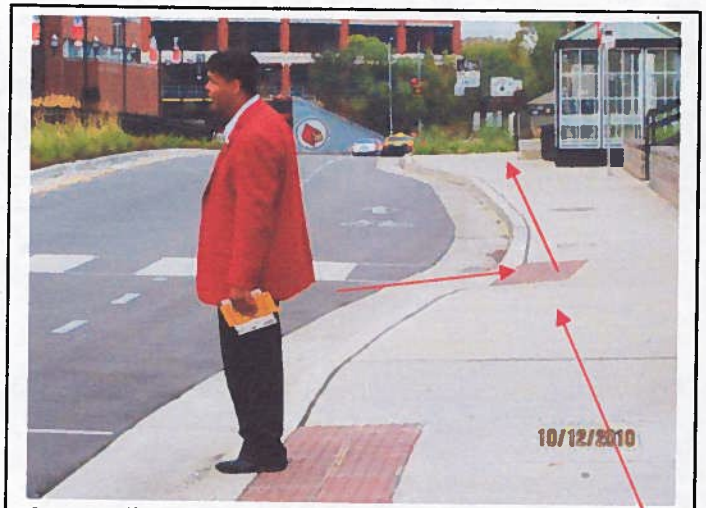
The Educational Core Bike Loop will provide a quicker, safer route for bikes to navigate around the perimeter of campus, and reach cross campus roadways, without having to interact with pedestrians on crowded sidewalks. Consistent signage, surfaces and gateway designations will provide clear understanding of the campus bike system and encourage its use.

Left: Educational Core Loop options, both north and south of Eastern Parkway; to reduce crossings at Speed School light; provide access to East bound Eastern Parkway lanes at light.

Bike lanes marked to connect with parking lot around to light. Dismount zone top right w/sign.

Old Eastern Parkway with bike lane markings and way-finding signs; connects to Brook.

Eastern Parkway Gateway



Crosswalk to Speed School on Eastern Parkway; Bike Gateway to campus needed to reduce conflict areas.

Left: Bikes currently use pedestrian curb cuts to exit Eastern Pkwy.

Right: Install bike curb cut with bollards to safely separate auto, bike and pedestrian travel zones to north campus. Creating this bike "short-cut" will reduce bike traffic at 3rd and Eastern Parkway.

Below: To access East-bound lanes, bikes must go on sidewalk next to retaining wall, or against traffic on roadway to light.

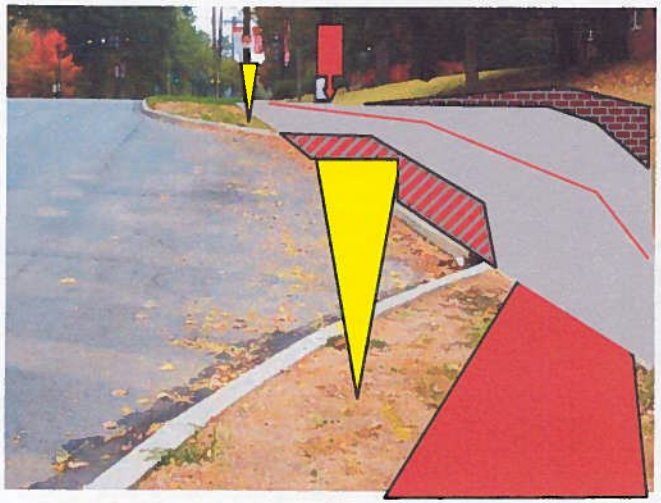
Right: Create bike exit prior to intersection (background) and connect with bike path above retaining wall to reduce bike-ped conflict on sidewalk.

Add curb cut and dismount zone north of Eastern Pkwy to reduce bike and pedestrian conflicts on sidewalks.

Dismount zone on sidewalk north of Eastern Parkway, for bikes to access eastbound lanes or Speed School.

Educational Core Loop: 3rd Street Mixed Use Pathway; 3rd Street Pathway at Library Bike Loop

Existing, 3rd Street looking north toward Oval entrance to campus



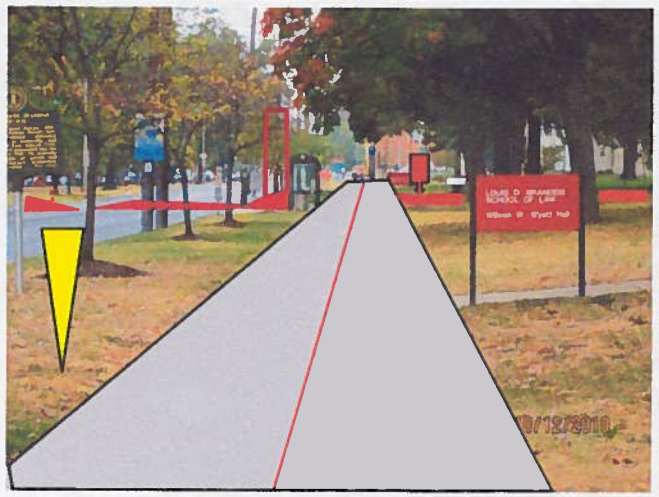
Add bike lane to mixed use pathway, behind bus pull-off

Top Right:

Replace existing sidewalk with pervious surface for mixed-use pathway along 3rd Street; looking north to business school.

Bottom Right:

Separating bike and pedestrians in high traffic areas is critical to creating safe conditions on campus. Library Loop will cut right to go behind Ford, Gardiner and Gottschalk Halls (on bike only pathway).

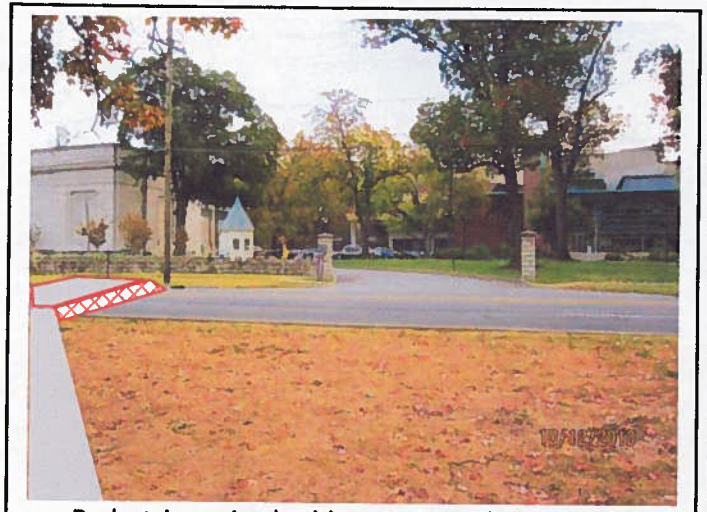


Third Street Mixed-use Pathway looking north at Library Bike Loop Gateway and East-West crossing.

3rd St. Mixed-use path (gray foreground) at Library Bike Loop (red) and pedestrian-only Century Walk.

Unity Park Mixed-use Pathway; Library Loop Bike Gateway; West Campus Bike Gateway

Expanded mixed-use path in Unity Park; Yield to Pedestrians on path signs; and way-finding signs.



Pedestrian raised-table crossing; Library north.

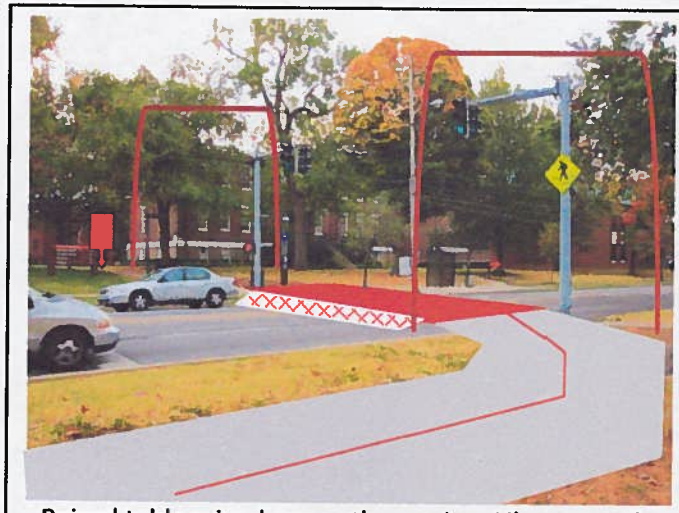
East to West campus crossings:

Existing crossings far exceed accepted distances between crossings, inviting jaywalking.

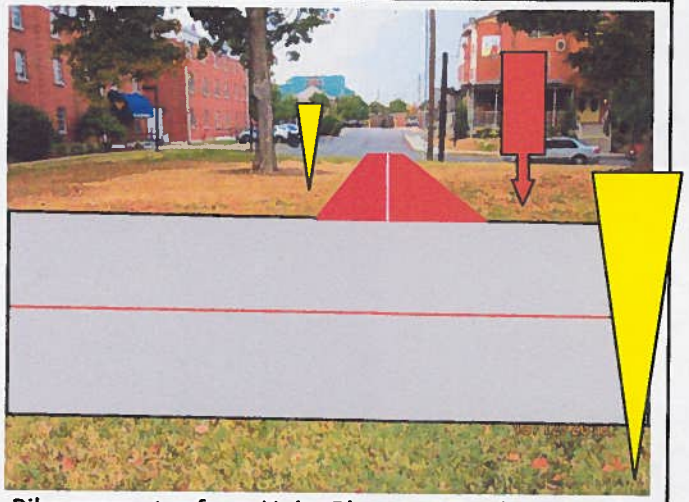
"LEED" neighborhood design calls for street crossings every 400' maximum.

Add crossway on 3rd Street between Library and Museum in order to meet huge crossing demand at this location from dorms and Greek housing.

Right:
New bike connect-ions also needed to keep sidewalks safe for pedestrians.



Raised table mixed-use path crossing; Library south. Library Loop and West Campus Gateway locations.



Bike connector from Unity Place to Mixed-used path.

Belknap Campus: Bike-only Pathways

Library Quad Bike Loop, northeast of Life Sciences building.

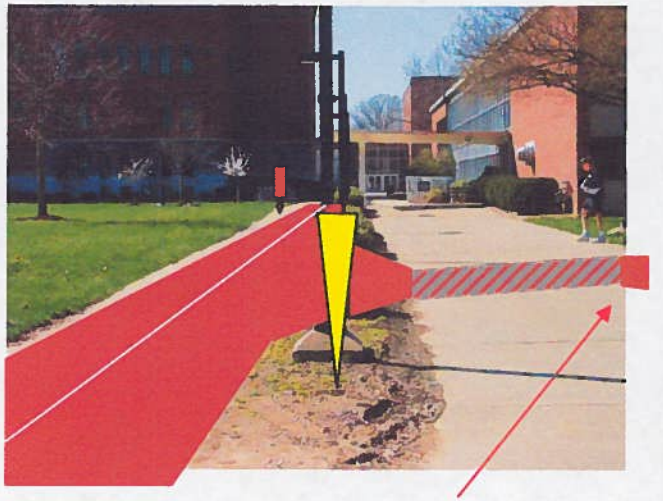
1st Street Connector Bike Pathway (red on left) from Info Building looking south toward Library Quad Loop.

Bike-only pathways (marked in red) require "yield" signage and surfaces (red/gray) when crossing sidewalks

Helping to create clear understanding of who travels where, and who yields to whom, on campus will help posture cyclists as safe and respectful on-campus travelers.

Creating infrastructure that allows a pleasing coexistence between cyclists and pedestrians is very important so that cyclist can take advantage of the ease-of -access to campus buildings. This incentive is important when trying to encourage more people to try biking commuting.

Library Quad Bike Loop East of Humanities building.



Library Quad Loop turns right to run between Schneider and Gottschalk. Yield to pedestrians at sidewalk.

Bike/Service Vehicle Campus Roads

Pedestrian/Dismount Zone leading to Library Quad via Century Walk to left. Bike Lane markings; signage.

Bike Lane markings on service road behind Shumaker Research Building; way-finding sign in background.

Right:

Dismount zone in Library Quad will require ample secure, covered bike parking around perimeter of zone.

Adding racks under existing overhangs of Life Science and Humanities buildings will support riders' efforts to comply with no ride zone.

Left:

Way-finding signs need to direct riders to:

- Designated bike routes
- Buildings
- Streets
- Bus stops
- Bike service and support areas
- Security

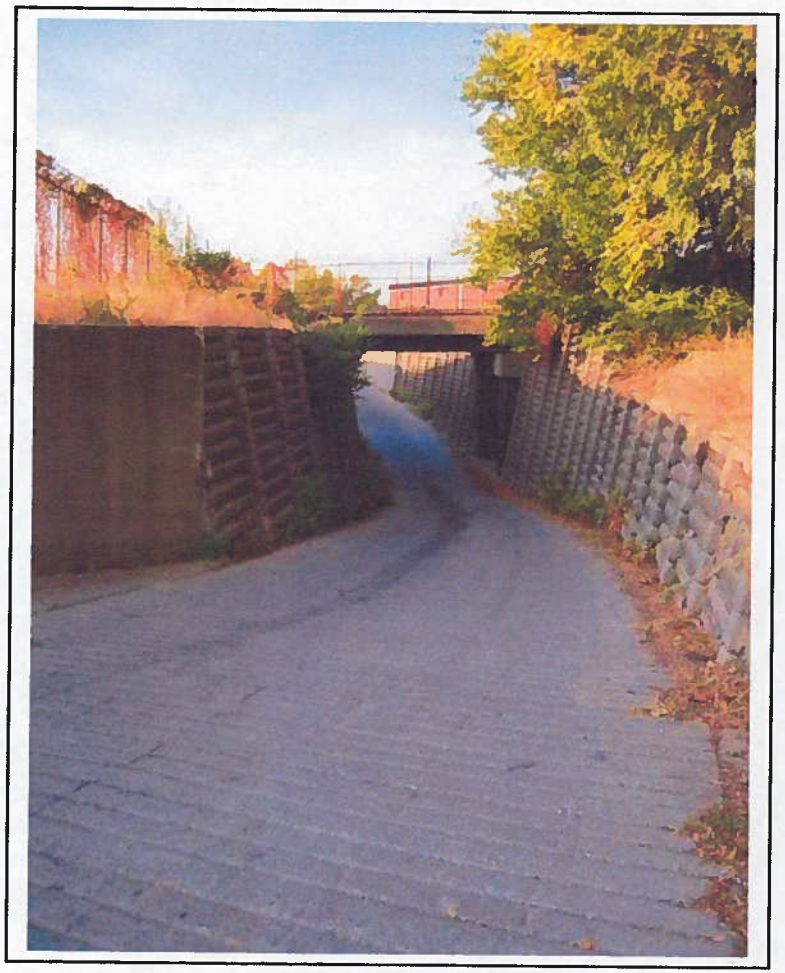
Dismount Zone in Library Quad

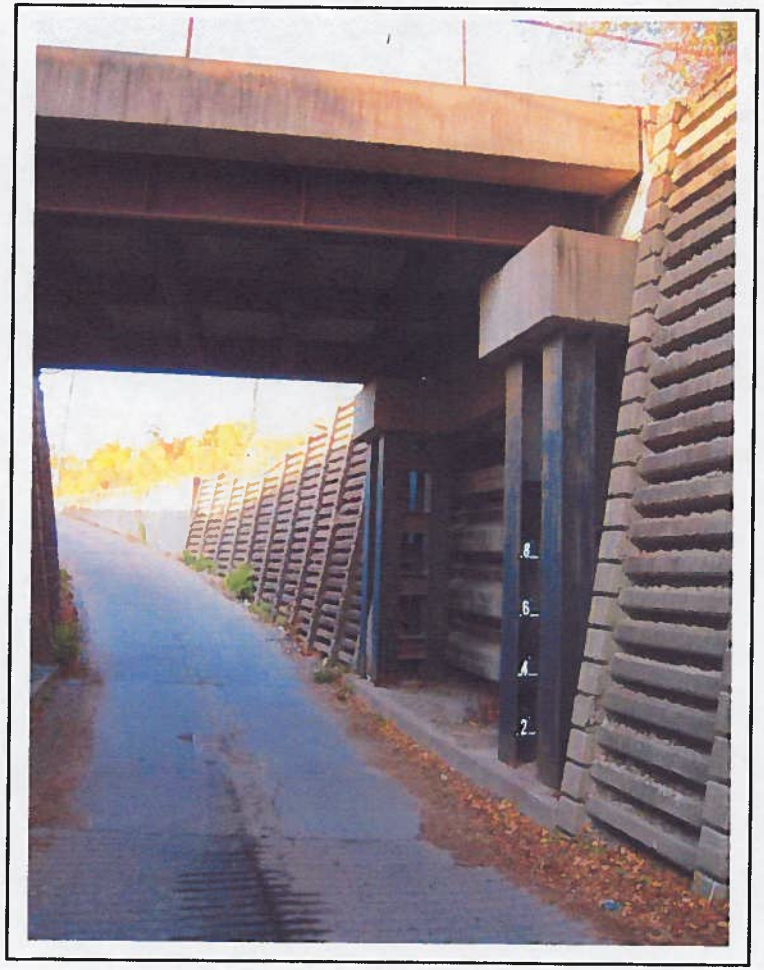
Dismount zone signage in Library Quad; add covered bike racks under overhangs north of Life Sciences.

Dismount Zone surfaces and signage at Library Quad entries (above: Century Walk from Gottschalk to Ford).

Bike Tunnel Connection to South Campus and Athletic Fields

The existing tunnel on Kentucky Trailer campus offers a fantastic opportunity for a bike connection to south campus property. Connections from South Campus to 3rd Street at Winkler may be possible by creating a new bike and pedestrian crossing of the railroad tracks. A vacated gas station on 3rd Street could be the future location of this bike gateway; this could eliminate the need to navigate the dangerous underpasses on 3rd and 4th, allowing students and employees to reach campus from south and southwest neighborhoods.





Belknap Campus: Perimeter Streets and Intersections

Five Design Elements: To physically reconnect people from surrounding neighborhoods to Belknap campus using non-motorized transit

1. Curb Bumps and Medians; 2. Bike Lanes; 3. Bike Boxes; 4. Bike Signals & Signs; 5. Human Scale

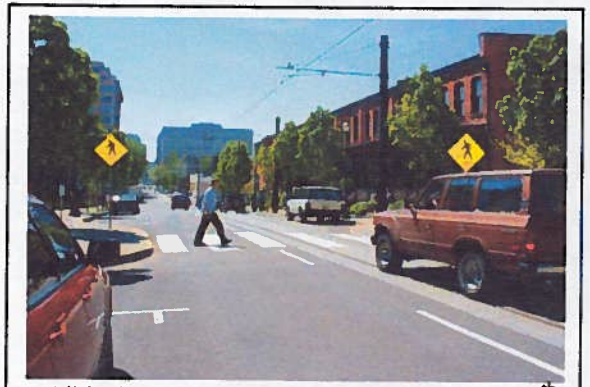
Element 1: Curb Bumps and Medians

Used to reduce pedestrian crossing distances and improve safety for all modes in dangerous traffic situations.

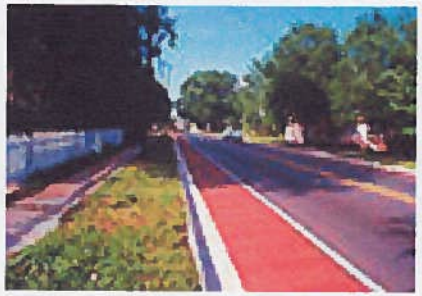
Curb bumps to be used at all intersections surrounding campus with street parking lanes to reduce crossing distance and times.

Bike and pedestrian refuge islands slow traffic and allow crossing one direction of traffic at a time (3rd Street at existing and new East to West Library crossing using raised tables.

Mid-block curb bumps to slow traffic and create safer crossings for riders and walkers (on 4th Street at residence hall, west parking entrance south of Brandeis).



Midblock curb bumps and crossing needed at 4th south of Brandeis from parking to dorms.



Medians to separate bikes from pedestrian traffic (needed for bike path along Stansbury Park on 3rd Street).

Bike Lane behind bus pull off creates pedestrian refuge and safer bike lane (future Cardinal at Playhouse and 2nd south of Card).

Element 2: Bike Lanes

Used to clearly define bicycle travel space with colored lane markings, striping, symbols or buffers.

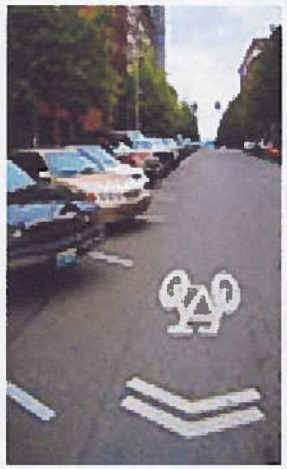
A. Bike Lane Buffered by parked cars

B. Buffered contra-flow Bike Lane

C. Striped Bike Lane crossing

Several different types of bike lanes will be called for on roadways surrounding the Belknap campus. Cardinal Boulevard will have space for buffered bike lanes (see B.); 4th Street, 3rd Street, and 2nd Street and Floyd will require sharrows or striped priority bike lane where bikes have the right of way and cars can pass in the left lane (see C. and E.); Intersections will use colored bike lanes to increase visibility of bike zones (see F.); Bike surfaces will be unique to differentiate from auto and walkways (see D. and G.). Bike routes leading to campus within the University District use bike lanes buffered by parked cars to encourage use by less skilled riders, women with children, and older riders (see A.)

D. Surfaces to clearly define separate bike and pedestrian zones on off-road mixed use pathways.



E. Sharrow Bike Lane and back-in, diagonal auto parking spaces improve visibility.

F. Colored bike lanes are used in many cities to improve visibility and so car drivers can better understand bike travel zones.

G. A bike-only, two way pathway with designated lanes.

Element 3: Bike Boxes

Used to make cyclists more visible at intersections by getting them in front of the cars; also, bike boxes are used to create more visible lane crossings and to let motorist know where and when to expect bicycles to change lanes.

Bike Boxes: separated from pedestrian crossing space and in front of auto stop bar

Bike boxes should be incorporated at all intersections surrounding the core campus either with paint or colored surface material, including:

- 4th and Cardinal
- 3rd and Cardinal
- 2nd and Cardinal
- 1st and Cardinal
- Brook and Card
- Floyd and Card
- Floyd at Garage
- Floyd and Warnock
- Eastern and 3rd
- 3rd and Brandeis
- 4th and Brandeis

Bike Box Lane Changes:

- To access Bike Gateways onto the Belknap campus.

Bike Box with turn lane

Bike box for lane crossing.

Element 4: Bike Signals and Signs

Bike signals give cyclists advanced green light; signage to identify separate auto/bike/pedestrian spaces and way-finding.

Separate bike signals improve timing of bike, pedestrian and car movements.

Signals and striped poles alert bikes and cars to bicycle and pedestrian crossings zones.

Signals for bicyclists needed where shared use pathways cross auto traffic.

Improved signage can increase understanding and awareness of cycling movements on roads.

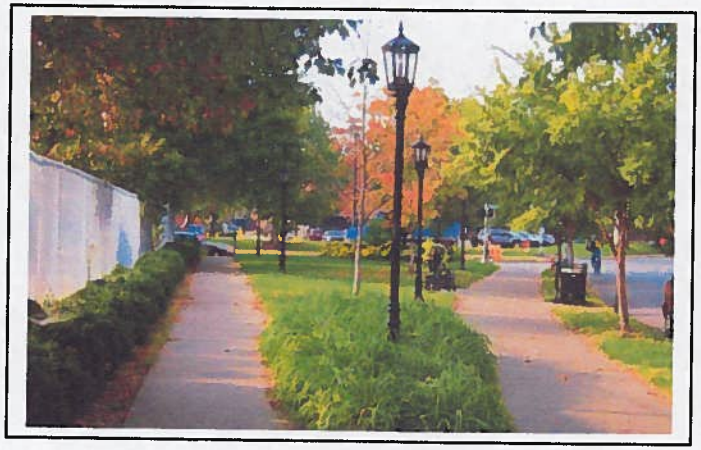
Signage with distance and cycling time to destinations.

No right on red signs supplemented with detection cameras; fines used to reduce danger and number of "right hook" crashes.

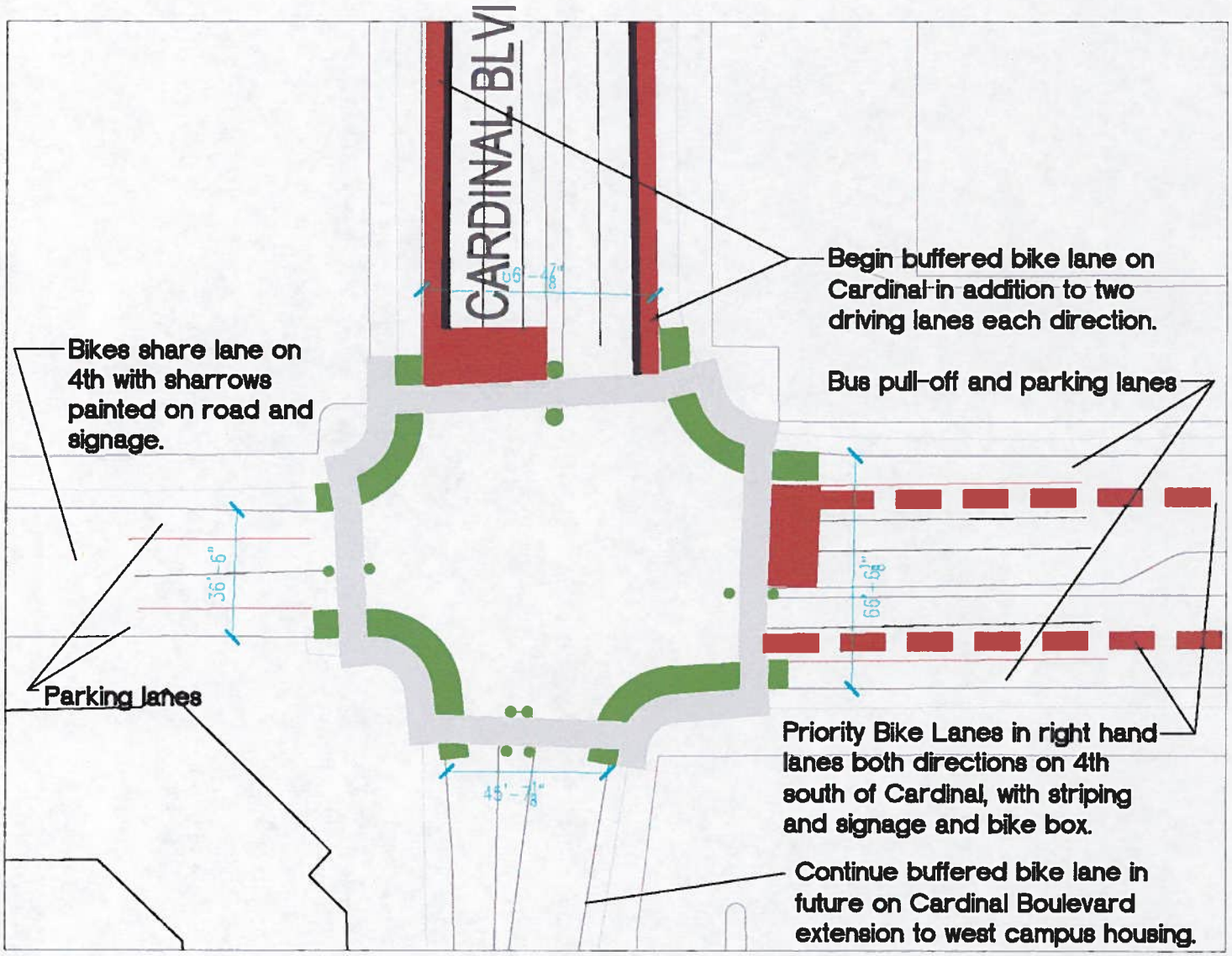
Element 5: Re-establish Human Scale along Belknap Perimeter Roadways

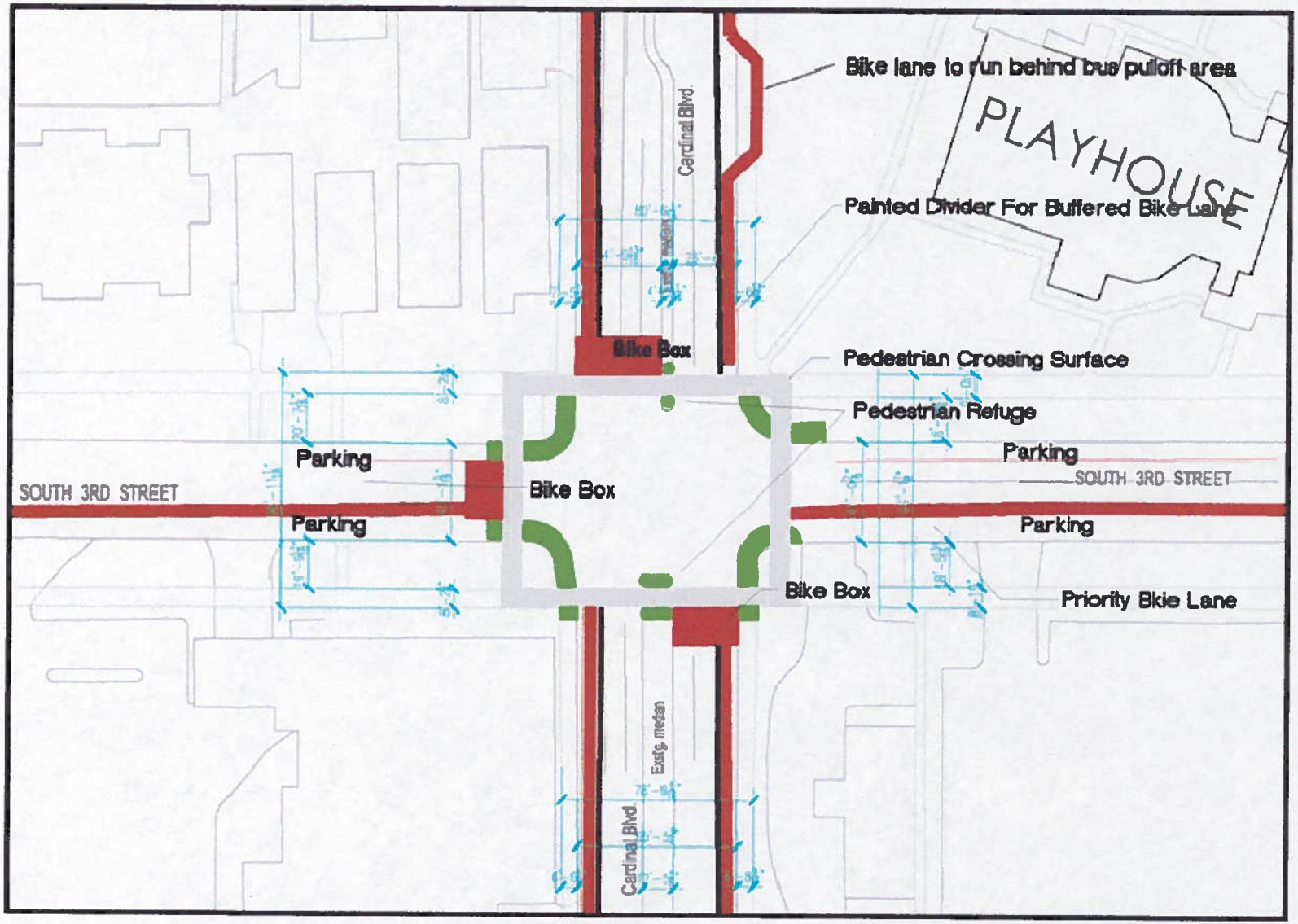
The university and neighborhoods have the opportunity to work together to return streetscapes to a more human scale which will also help as traffic calming devices re-establish the streets as safe places for people to travel as well as interact with one another.

Pedestrian scale is established in this green space at the corner of 2nd and Cardinal by using benches, planters, trash receptacles, landscaping, and human scale lighting fixtures and signage.



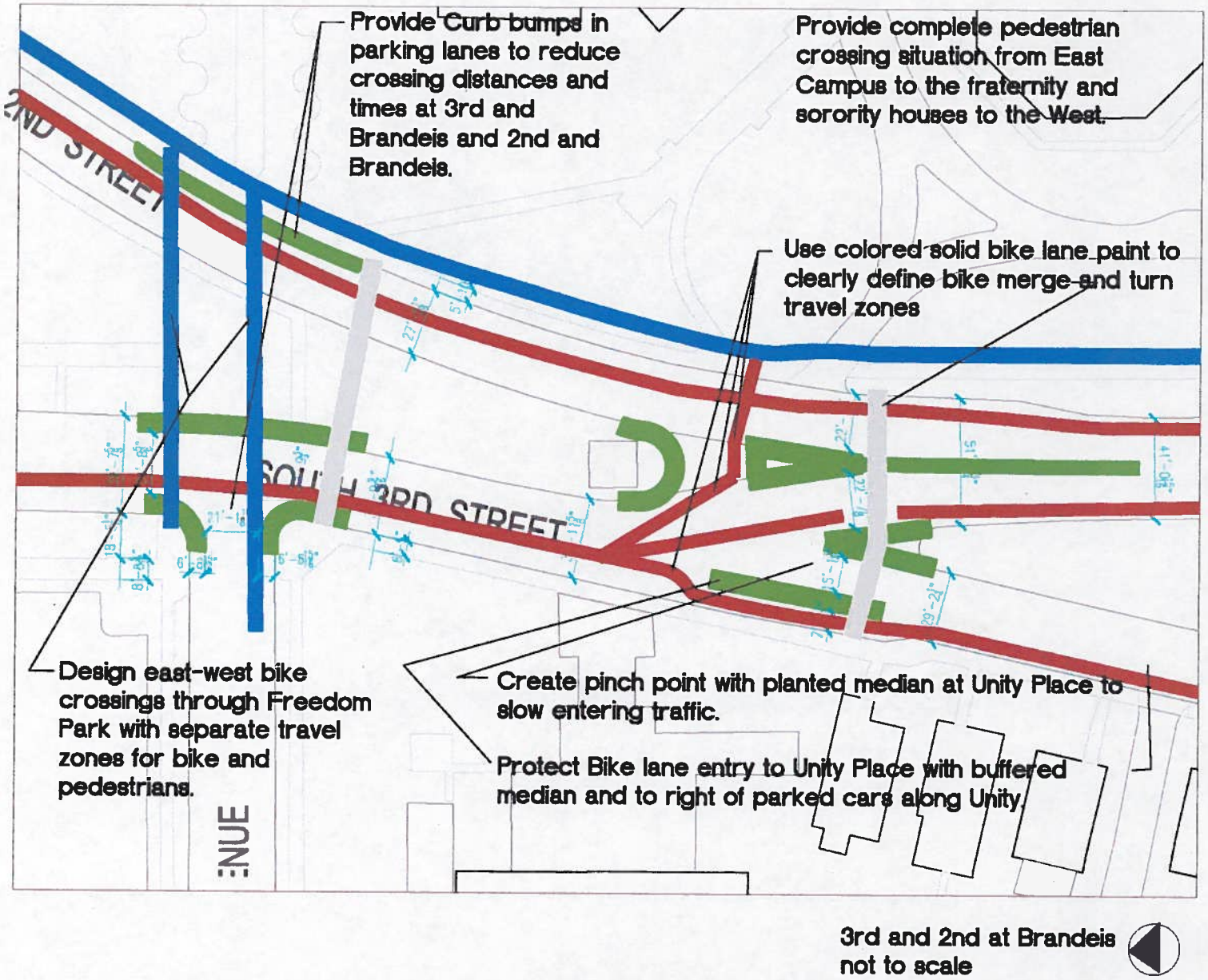
Bottom right: Small picnic area at on opposite corner of 2nd and Cardinal adjacent to student apartment complex helps establish pedestrian scale.

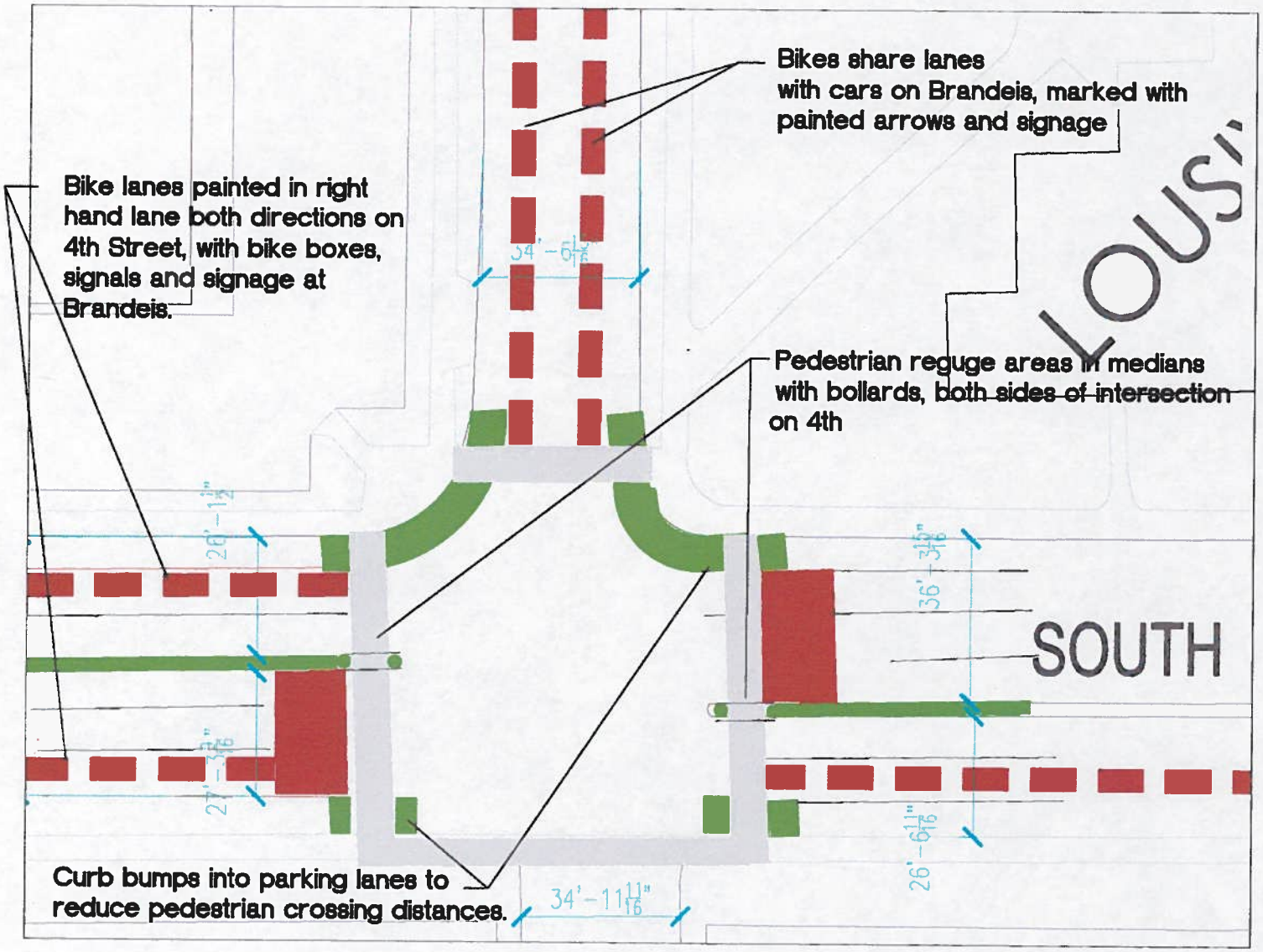

CARDINAL BLVD
Begin buffered bike lane on Cardinal in addition to two driving lanes each direction.
Bikes share lane on 4th with sharrows painted on road and signage.
Bus pull-off and parking lanes
Parking lanes
Priority Bike Lanes in right hand lanes both directions on 4th south of Cardinal, with striping and signage and bike box.
Continue buffered bike lane in future on Cardinal Boulevard extension to west campus housing.
4th and Cardinal Blvd
Not to scale



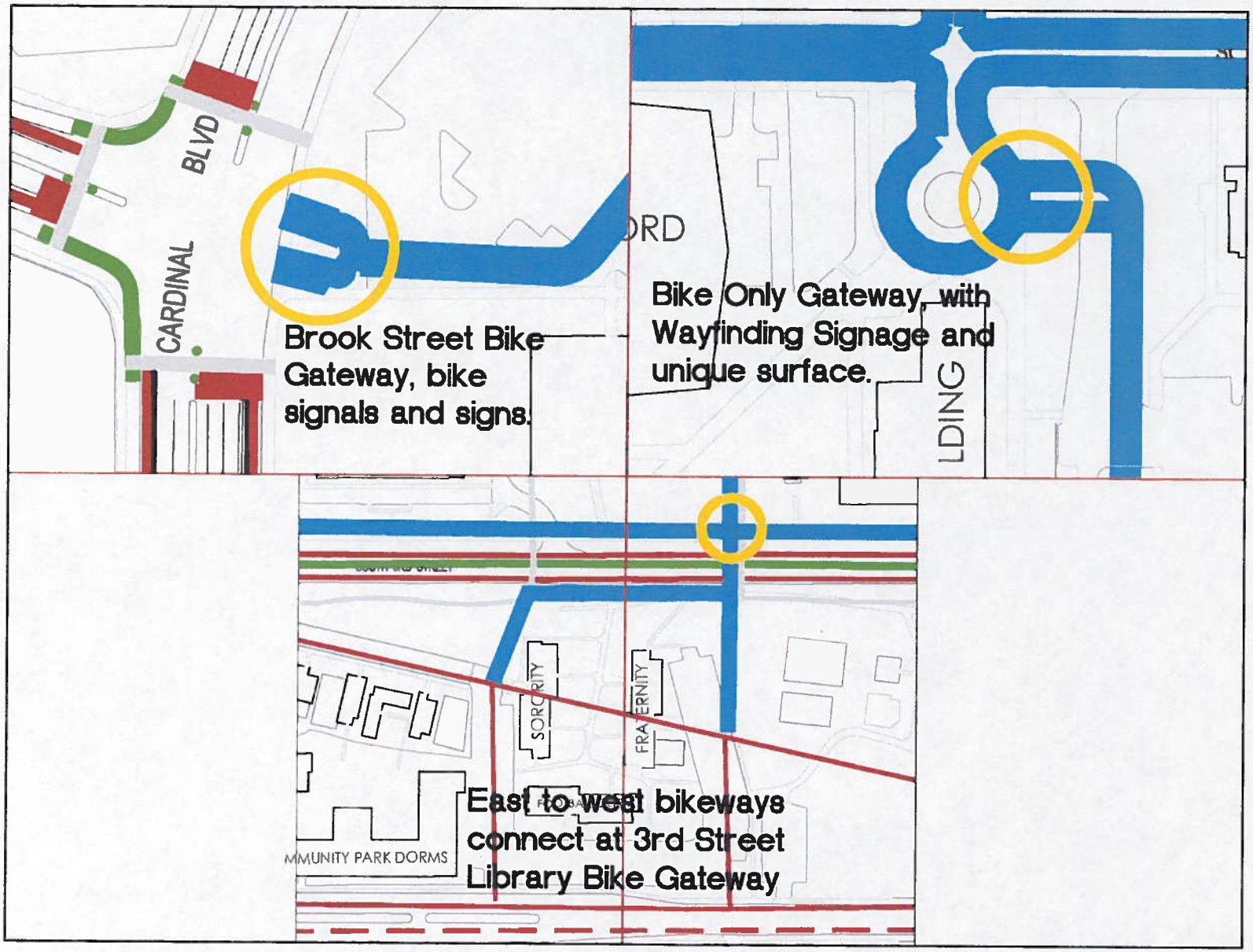
3rd and Cardinal Blvd
Not to scale

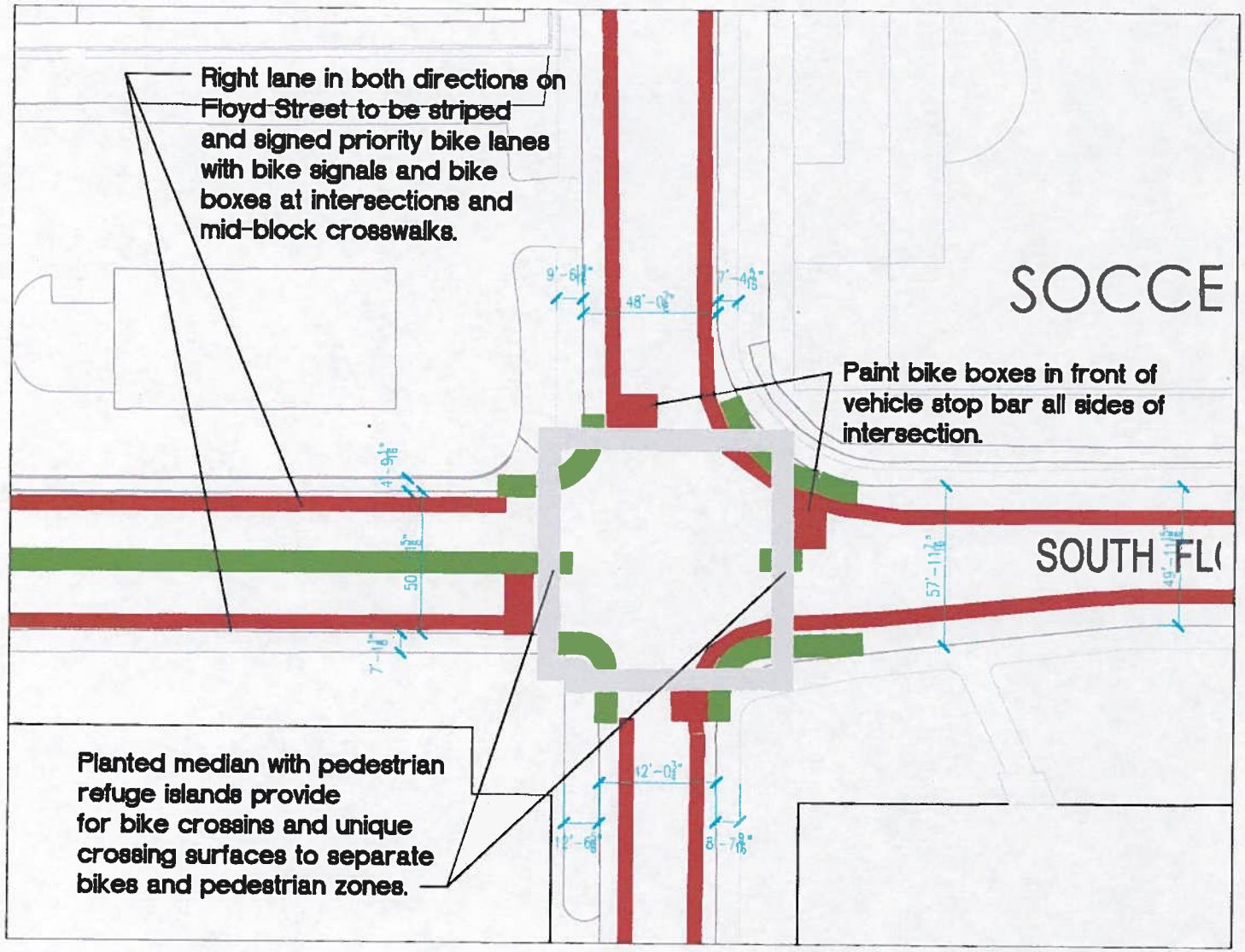
2nd and Cardinal Blvd
Not to scale

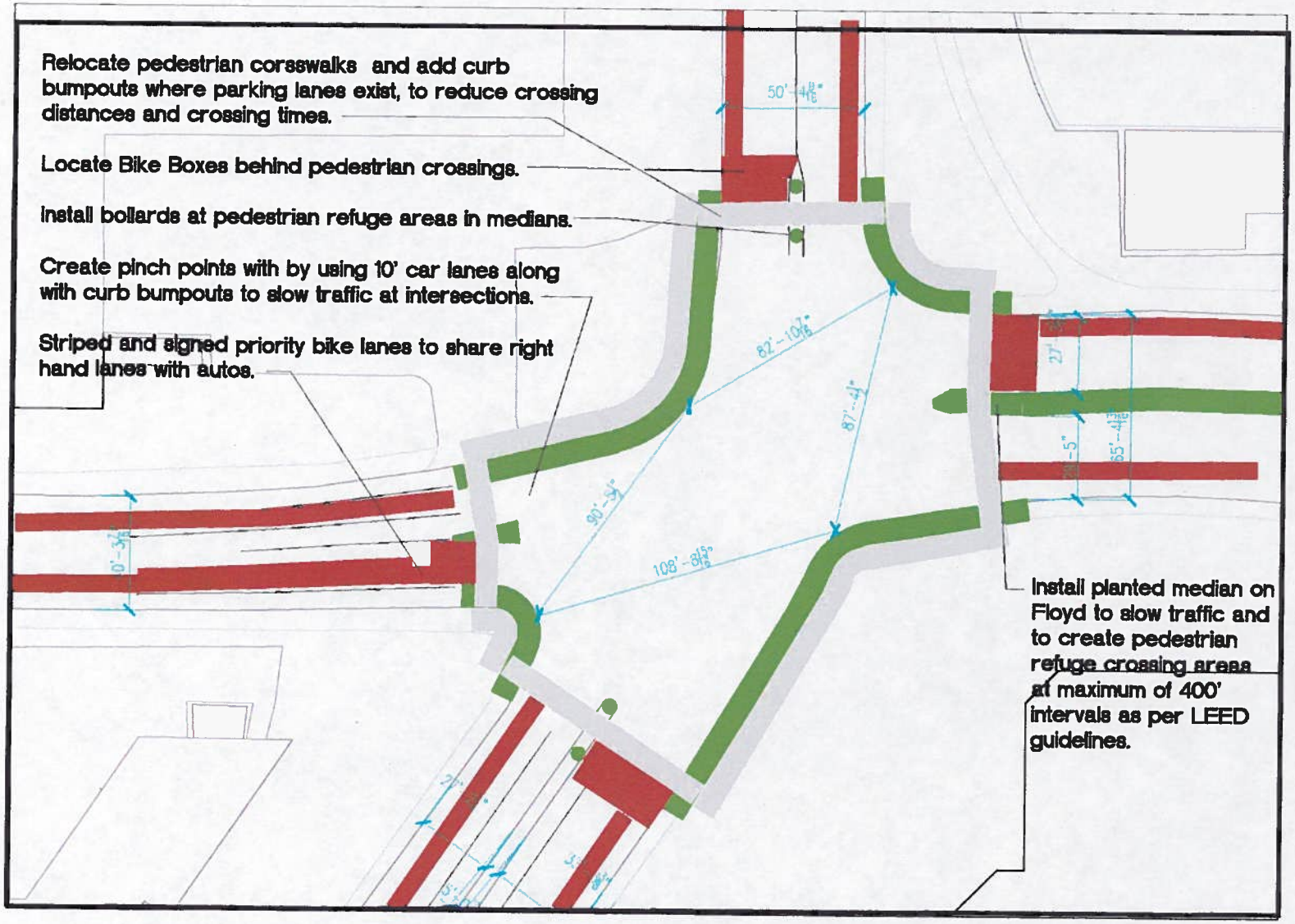

Provide Curb bumps in parking lanes to reduce crossing distances and times at 3rd and Brandeis and 2nd and Brandeis.
Provide complete pedestrian crossing situation from East Campus to the fraternity and sorority houses to the West.
Use colored solid bike lane paint to clearly define bike merge and turn travel zones
Design east-west bike crossings through Freedom Park with separate travel zones for bike and pedestrians.
Create pinch point with planted median at Unity Place to slow entering traffic.
Protect Bike lane entry to Unity Place with buffered median and to right of parked cars along Unity.
3rd and 2nd at Brandeis
not to scale



4th and Brandeis
Not to scale


BLVD
CARDINAL
Brook Street Bike Gateway, bike signals and signs.
Bike Only Gateway, with Wayfinding Signage and unique surface.
SORORITY
FRATERNITY
MMUNITY PARK DORMS
East to west bikeways connect at 3rd Street Library Bike Gateway


Right lane in both directions on Floyd Street to be striped and signed priority bike lanes with bike signals and bike boxes at intersections and mid-block crosswalks.
Paint bike boxes in front of vehicle stop bar all sides of intersection.
Planted median with pedestrian refuge islands provide for bike crossins and unique crossing surfaces to separate bikes and pedestrian zones.
SOCCE
SOUTH FL
Floyd and Warnock
Not to scale



Floyd and Cardinal Blvd
Not to scale

Appendix D: Belknap - HSC Connections

A stronger intermodal connection between the HSC and Belknap campuses is needed to reduce car traffic and parking problems on both campuses. UofL's March 2010 Alternative Transportation Survey indicated that about 1100 people make this 2 mile commute between Belknap and HSC campuses every day of the week, and an additional 2,500 make this commute several times a week. These two campuses are connected by the original street grid through a mix of commercial and residential neighborhoods, but they are also separated by Interstate 65 and major railroad lines.

Bicycling between Belknap and HSC has the potential to be a very safe, healthy and sociable choice.

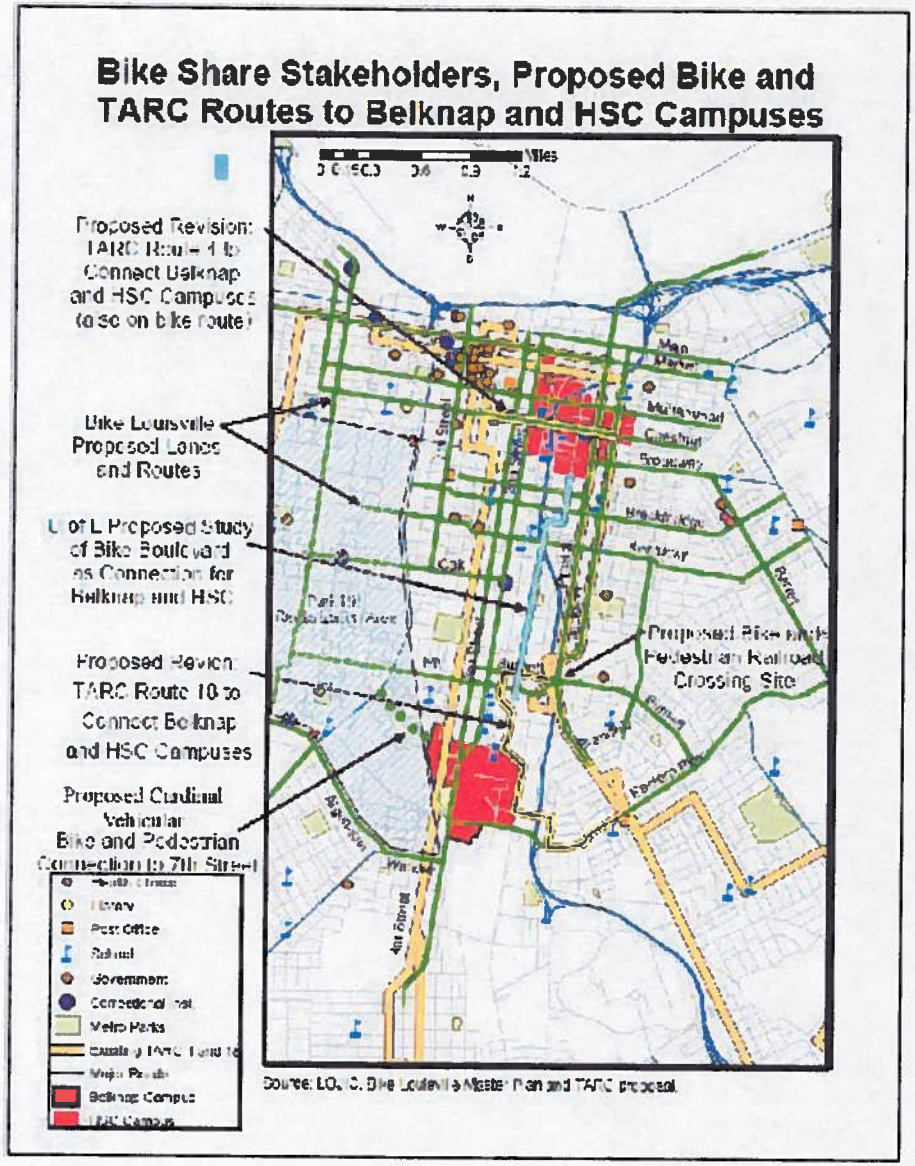
Bike Louisville's proposed bike routes provide the following on-road bike connections: South on Third or Preston, and return rides on the adjacent streets going north on 2nd or Jackson. However, in order for commuters to give up driving and make this trip by bike, the route will need to feel very safe and offer alternative travel modes along the way.

Creating a bike boulevard (a roadway which is designated primarily for bike and pedestrian use with local-access-only for autos) or other significant on-street bicycle facility with traffic-calming measures between the two campuses could be married to a city-wide pilot bike-share program (universities, municipal, corporate and non-profit entities) to create a world-class bicycling opportunity.

This mix of secure, multi-modal transit and bike-share stations at each campus, frequent, direct bus service connecting both campuses, and the creation of a safe bike route between the two campuses has the potential to show real improvement in environmental, financial, social and health indicators for the university and its community.

Cities like Portland have converted many residential streets to bike boulevards.

Bike Share Stakeholders, Proposed Bike and TARC Routes to Belknap and HSC Campuses



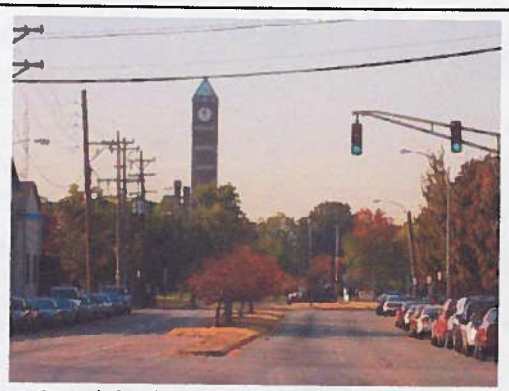
Bike Boulevard Audit

Less skilled riders, older riders, parents riding with children and women riding alone are more likely to express concerns over riding on roads with heavy, fast moving auto traffic. In some cities bike boulevards are being created to meet the needs of these rider groups as supplements to bike lanes.

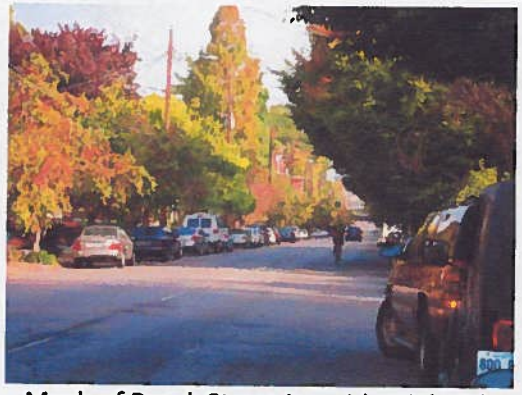
Cities installing bike boulevards report rapidly increasing numbers of new bicyclists on the roads due to the conversion of low traffic residential roads into designated zones for bikes and pedestrians, while maintaining local auto access. Converting streets to a Bike Boulevard does not require construction of new surfaces or painting of lanes, but rather changes in signals and signage to alter traffic flow.

UofL proposes that a bike boulevard audit be conducted on streets that run through the neighborhoods between Belknap and HSC, especially Brook and Floyd Streets. The proposed bike boulevard could be achieved by adapting the following:

- Switch Brook and 1st Streets from one-way to two-way, as supported by the Old Louisville Neighborhood Council, the Toonerville Neighborhood Association and a February 2010 study for Louisville Metro.[2]
- Remove stop signs and some signals to create non-stop biking between traffic signals.
- Add and maintain stop signs at all cross streets and supplement all with Bike Boulevard Crossing signs.
- Time remaining traffic signals at appropriate biking speeds, to allow continuous riding for cyclists.



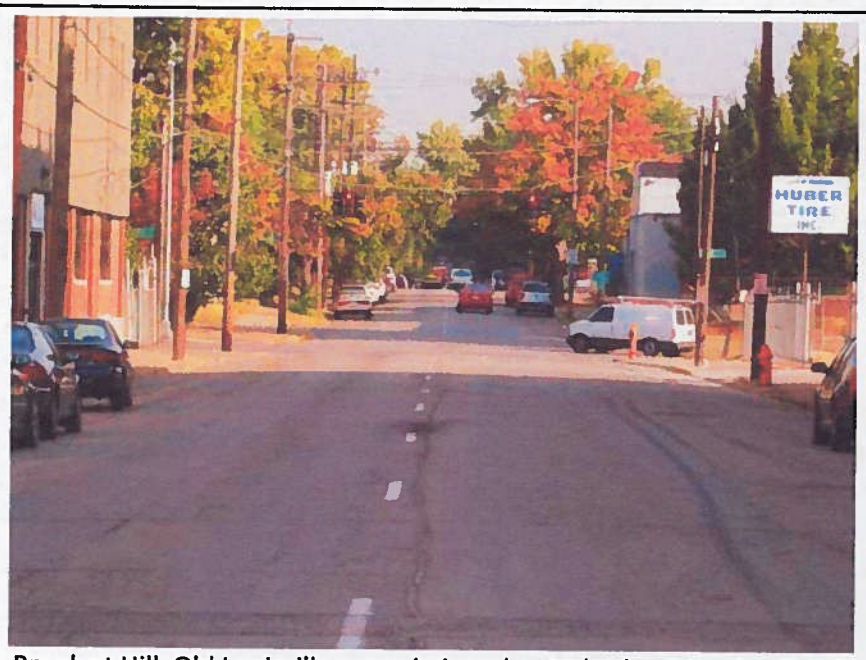
Brook looking south toward Belknap campus (1st Street merges with Brook to create south bound lanes). Creating marked, priority bike lanes from Cardinal to Hill would encourage cyclists to connect with the bike boulevard.



Much of Brook Street is residential with lots of parking, it's narrower than 3rd (which has a southbound bike lane), and traffic volume is lower and slower.

[2] http://louisville.edu/updc/masterplan/First%20and%20Brook%20Street%20Study%20Report.pdf

- Install traffic calming devices for cars at signed intersecting cross streets (small roundabout/signage islands)



Brook at Hill. Old Louisville commissioned a study about turning Brook back into a two-way street, which would slow traffic and encourage walking and cycling. Replacing traffic lights with stop signs for cross streets would create a fast, priority route for cyclists between Belknap and HSC/downtown.

Neighborhood businesses would benefit from a two-way bike boulevard and additional foot and bike traffic, reducing car parking needs.

Brook under I-65 at Kentucky. Timing signals so that cyclists can ride through intersections below I-65 without stopping would calm traffic and make cycling a more attractive option.

Appendix E: Bike-Share Program

UofL has the opportunity to work with other stakeholders to establish a "Third Generation" bike-share program. Louisville Metro government, urban universities and colleges, bicycle non-profits, corporations, correctional institutions and others can emulate programs which are quickly taking off in Minneapolis, Denver, D.C. Paris and Montreal.

Minneapolis "Nice Ride" Bike-Share

- Paris, 2007: 10,000 bikes; 18 million trips after 18 days
- Montreal: 30,000 subscribers
- Minneapolis, June 2010: 700 bikes; on August 25, 2010 hit 50,000th ride

The main purpose of first and second generation bike-share programs run by colleges and universities over the past decades was to provide on-campus transportation. Louisville's purpose in creating a bike-share program must be to meet the much broader needs of commuting to, from and between destinations in order to reach campus and city carbon neutrality while improving the health and economical travel options of commuters. By combining resources, stakeholders could create a city wide bike-share system, rather than multiple piecemeal attempts with limited scope, maintenance, support and connectivity.

Third generation bike-share programs in Minneapolis, Denver, Montreal, Paris:

- Main purpose is to provide transportation to, from and between multiple destinations
- First half hour free for short trips
- Bikes are sturdy, vandal resistant; maintained by full time, roaming maintenance crews
- 24/7 self service checkout from moveable, wireless, solar kiosks
- Reduce parking demand and costs for city, individuals, institutions and corporations
- Online subscriptions or pay at kiosks
- Corporately run, often by advertising agencies or healthcare providers utilizing on-bike advertising

Melbourne Bike-share Kiosk

The Minneapolis program offers many similarities to Louisville's potential bike-share opportunities:

- Universities tackling commuting expenses, sustainability, congestion issues
- Local corporate leaders promoting bike-sharing, better health and savings
- Active local non-profit bike advocates and educators
- Governments launching budding bike-share program

Minneapolis bike-share statistics:

- 700 bikes at 65 kiosks can be "scaled-up" (and out-geographically) as the system grows
- 2 years from concept to operational
- Required $3.3 million to become operational
- 1.7% of Minnesota's Federal Transportation funding needed to support startup
- Human and financial resources: Livable Communities Act (S.1619) Grant, up to $5,000,000 dollars per project; State, non-profits, corporations, educational institutions, corrections, city stakeholders pooled resources.

Humana and National Park Service Employees at new B-cycle station, D.C. President and CEO of Humana, Michael B. McCallister, said "Biking instead of driving is good for your body and good for the planet. It's also fun. As we get serious about reforming health care in our country, we absolutely must get serious about being healthier. We have to change the way we work and live." (National Park Service Digest)

Bike advertising can help fund bike-share.

Bixi bike-share terminal, Melbourne

B-cycle Station, Denver

Appendix F: Cargo Bikes On-Campus

Cargo bikes could be offered for maintenance and delivery trips on campus.

Another consideration for the Belknap core campus is how improved bicycle infrastructure in the area will provide a great opportunity for the use of cargo bikes, patrol bikes and bike-share-station rentals/borrows by university employees. As Bill Stites, custom cargo bike builder in Portland, Oregon, points out, "...there is a lot of room between the forty pound bike and the two-thousand-pound car" (Mapes, p. 274). Replacing trucks and cars that are currently being used on campus by security and maintenance personnel, faculty and staff would not only make biking more visible on campus, but also use less gas, reduce pollution and highlight the university's commitment to successfully meeting its zero carbon goals while improving the health, safety, and financial well-being of the campus community.

Future on campus deliveries could incorporate use of non-motorized vehicles from central delivery areas. Employees/students with children in on-campus child care facilities could use family bikes for healthy and fun midday exercise breaks.

Appendix G: Funding Options (Source: Louisville Bicycle Master Plan)

National Highway System http://www.fhwa.dot.gov/planning/nhs/maps/tn/nashville_tn.pdf.

- Surface Transportation Program (STP)
- Transportation Enhancements (TE)
- Highway Enhancement and Railway-Highway Crossing Programs
- Highway Bridge Replacement and Rehabilitation (HBRRP)
- Recreational Trails Program
- Congestion Mitigation and Air Quality (CMAQ) Improvement Program
- Federal Lands Highway Program (FLHP)
- Job Access and Reverse Commute Grants

Federal Transit Program

- Urbanized Area Formula Grants
- Capital Investment Grants and Loans
- Formula Program for other than Urbanized Area
- Suburban Mobility Initiatives Program
- Regional Mobility Program

State and Community Highway Safety Grants
Safe Routes to School (http://www.saferoutes.ky.gov/)
National Park Service Land and water Conservation Fund (LWCF) Grants http://www.nps.gov/lwcf/
HUD Community Development Block Grants (CDBG) http://www.hud.gov/offices/cpd/communitydevelopment/programs/
Private Funding Sources:
Bikes Belong Coalition http://www.bikesbelong.org/grants
AmeriCorps' National Civilian Community Corps (NCCC) http://www.americorps.gov/for_organizations/apply/nccc.asp
Kodak American Greenways Awards Program http://www.conservationfund.org/kodak_awards
Fish America Foundation http://www.fishamerica.org/grants/
American Hiking Society National Trails Fund http://www.americanhiking.org/NTF.aspx
The Global ReLeaf Program http://www.americanforests.org/global_releaf/grants/
The Robert Wood Johnson Foundation http://www.rwjf.org/grants/
Center for Disease Control and Prevention http://www.cdc.gov/about/business/funding

Potential Partners and Funding Options

Partner	Potential Funding Source
UofL: Safety and education for pedestrians and bicyclists.	**Surface Transportation Program Transportation Enhancements Set-aside (TE 23 USC 133(d)(2))** Facilities, education and rails to trails.
UofL: Reduction in traffic fatalities and serious injuries on public roads.	**Highway Safety Improvement Program (HSIP 23 USC 148).** Identify and correct hazardous locations, sections and elements (railway-highway crossings that are dangerous for bikes and pedestrians, safety improvement projects on publicly owned bike or pedestrian pathways or trails.
UofL: Reduce transportation related emissions.	**Congestion Mitigation and Air Quality Improvement Program (CMAQ 23 USC 149)** Pedestrian walkways and bicycle transportation facilities, non-construction safety projects, demonstrate air quality benefits.
UofL: Planning, implementation and research grants	**Transportation, Community, and System Preservation Program (TCSP S-LU Sec. 1117, formerly TEA-21 Sec. 1221)** To investigate and address relationships among transportation and community and system preservation plans and practices and examine private sector based initiatives.
UofL: Mixed Use Trails/Linear Parks	**Recreational Trails Program (23 USC 206)** Non-motorized or mixed use trail maintenance, rehabilitation, facilities, construction and maintenance of equipment, trail construction and assessments, trail safety and environmental protection education.
TARC Capital and planning assistance (not operating expenses for areas over 200,000 pop.)	**Urbanized Area Formula Grants (49 USC 5307)** Improve bike and pedestrian access to transit facilities and vehicles, including bike stations. **Urbanized Area Formula Grants Transportation Enhancements Set-aside (49 USC 5307(k))** Pedestrian and bike access, bicycle storage facilities, installing equipment to transport bicycles on mass transportation vehicles.
Metro Public Works	
MSD, Metropolitan Sewer District	Storm water management grants
KIPDA, KY-IN Planning Development Agency	**Metropolitan Planning Program (MPP 49 USC 5305(d))** Metropolitan bicycle and pedestrian planning **Statewide Planning and Research (SPR 49 USC 5305 (e))** Statewide planning **Urbanized Area Formula Grants Transportation Enhancements Set-aside (49 USC 5307(k))** Pedestrian and bike access, bicycle storage facilities, installing equipment to transport bicycles on mass transportation vehicles.
Metro Planning	**National Highway System**

	(NHS 23 USC 103) Pedestrian and Bicycle transportation facilities on land adjacent to any **Interstate Maintenance (IM 23 USC 119)** Restore, resurface, rehabilitate and reconstruct pedestrian and bicycle facilities over, under, along interstates. **Metropolitan Planning Program (MPP 49 USC 5305(d))** Metropolitan bicycle and pedestrian planning highway on the NHS.
Bike Louisville	
Metro Health Department	
Metro Parks	**Alternative Transportation in Parks and Public Lands (49 USC 5320)** Provision of facilities for pedestrians, bicycles, and non-motorized watercraft. **Recreational Trails Program (23 USC 206)** Non-motorized or mixed use trail maintenance, rehabilitation, facilities, construction and maintenance of equipment, trail construction and assessments, trail safety and environmental protection education.
Humana	
JCPS: Planning, Design, and Construction of improvements for bike and pedestrian. Public awareness, education, enforcement, funding for training, volunteers and managers of SRTS programs.	**Highway Safety Improvement Program (HSIP 23 USC 148).** Signs and construction of bike and pedestrian crossings in school zones. **Safe Routes to School (SRTS S-LU Sec. 1404)** traffic calming, speed reduction, sidewalks, on-street bike facilities, off street bike facilities, secure bike parking, traffic diversion improvements in vicinity of schools.
Nonprofit Bicycling for Louisville	
Corporate Donors/Matching	
Corrections Facilities	
Americans with Disabilities	**Surface Transportation Program (STP 23 USC 133)** Modify public sidewalks to comply with the Americans with Disabilities Act. Does not have to be in right of way of a Federal-aid Highway.
EPA Site Owners	
Historic Properties/Roads	
Rails to Trails	**Surface Transportation Program Transportation Enhancements Set-aside (TE 23 USC 133(d)(2))**
Olmstead Parks	**Recreational Trails Program (23 USC 206)** Non-motorized or mixed use trail maintenance, rehabilitation, facilities, construction and maintenance of equipment, trail construction and assessments, trail safety and environmental protection education.

Appendix H: LEED-ND; Adopt as UofL Guidelines for Bicycle and Pedestrian Planning

(Source: LEED Neighborhood Design Handbook)

LEED-ND SLL Credit 4: Bicycle Network and Storage

To promote bicycling, transportation efficiency, reduced vehicle miles traveled (VMT), and improve public health through utilitarian and recreational physical activity.

- 1 secure, enclosed bike space for 30% of occupants, min. 1 per dwelling unit
- 1 visitor bike rack space per ten dwelling units, min. 4 per site
- 1 secure, enclosed bike storage space for 10% of retail and commercial workers
- 1 visitor bike rack space per 5,000 s.f. retail, min. 1 per business & min. 4/site
- 1 onsite shower facility per 100 employees, additional shower onsite per 150 employees
- Shower and changing facility requirements may be met by providing the equivalent of free access to on-site health club shower facilities, if the health club can be accessed without going outside.
- 1 visitor bike space per 10,000 s.f. commercial/non-retail, min.4 per building
- Secure, enclosed bicycle storage areas must be locked and easily accessible to residents and/or workers. Provide informational signage on using the storage facilities.
- Racks – must be visible and available within 100 feet of each main entry, with lighting.

LEED-ND NPD Credits 6 Street Network, 7 Transit Facilities:

To increase the pedestrian orientation of *projects*, minimize the adverse environmental effects of parking facilities, reduce public health risks by encouraging daily physical activity associated with walking and bicycling.

- Through streets or non-motorized right-of-way intersect boundary every 400 feet max.
- Transit stops shall have covered, partially enclosed shelters with seating and lighting
- Shelters shall have anchored bike racks with two point locking system
- Space shall be reserved for future shelters, racks and improvements
- Each stop shall display route information and schedules

LEED-ND NPD Credits 8, Transportation Demand Mgt:

To reduce energy consumption, pollution from motor vehicles, and adverse public health effects by encouraging multimodal travel to reduce peak-period motor vehicle trips by at least 20% compared to baseline using combination of following options:

- Vehicle Sharing: 50% of dwelling units and non-residential building entrances to be within ¼ mile walk of one vehicle with dedicated parking space. Through signage and other means, publicize to project occupants the availability and benefits of the vehicle-sharing program.

- If the project has more than 100 dwelling units and/or employees and has a minimum transit service of 60 daily weekday trips and 40 daily weekend trips, at least one additional vehicle and parking space for every 100 dwelling units and/or employees must be available.
- Subsidized transit passes, developer sponsored transit,
- 90% parking spaces sold or rented separately from dwelling units and non-residential s.f.

LEED-ND GIB Credit 4, Water efficiency:

- Pervious surfaces

Meet University Biking Programming items outlined in LEED, STARS, and CRSC

- UofL Student Cycling Coalition
- Biking Information Areas in Student Housing
- Resident Assistant Training on alternative travel options
- Student bicycle and sustainability challenges/competitions
- Offer sustainability internship opportunities for students
- Student Eco-Rep (LEED) positions or similar initiatives

Appendix I: Environmental Factors

SCENARIO: BASED ON BIKING RATHER THAN SINGLE OCCUPANT AUTO DRIVERS WHO AGREED OR STRONGLY AGREED THAT BIKE LANES WOULD MAKE THEM MORE LIKELY TO BIKE TO CAMPUS.
Model based on Tiger Grant calculations from Ames, Iowa: www.cyride.com

CALCULATION of Resulting CO2 Reductions from reduced VMT in Scenario:
Total VMT reduction per day = 32,524 VMT

Potential Resulting CO2 Reduction:
2005 CAFE Fuel Economy level = 22.5 mpg http://www.nhtsa.gov/cars/rules/cafe
Other GHG CO2 equivalent = 100/95 http://www.epa.gov/OMS/climate/420f05004.htm
CO2 burned per one gallon of gasoline = 8.8 kg TIGGER federal register guidance or http://edocket.access.gpo.gov/2009/pdf/E9-9469.pdf

Tons CO2 = mpg * VMT * CO2 per gal. gas *other GHG CO2 equivalent /1,000 (to convert kg to metric tons)
Tons CO2 = (22.5 * 32,524 * 8.8 * (100/95)) / 1,000
= 6,778.5 metric tons CO2e per day reduction
Full Time Equivalent Days = 8 months * 4 weeks * five days * .80 (to account for part time faculty/staff/students)
= 128 DAYS (FTE) Commutes
6,778.5 CO2e reduction * 128 days of commutes = 867,648 metric tons CO2e reduction per year

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Note: in 2010 UL Faculty/Staff generate 11,047 metric tons CO2e and in 2010 UL Students generate 6,585 metric tons CO2e.
Potential Savings to University: Resulting from potential reduction in # S.O.V. cars driven to campus each day = 4,225.
Number of parking spaces needed on university campuses (to determined by review of planning director, as per Land Development Code) requires (i.e. business schools) to provide one spot per three employees, and one spot per every four seats in classrooms. Therefore, a very conservative cost savings estimate for a 4,225 car reduction (approximately one sixth commuters are employees) would be 704 employees. One parking spot per 3 employees = 234 parking spots, *without even calculating any spots for students*. University costs per parking spot are between 17,000 to 26,000 dollars *(234) totaling between $3,978,000 and $6,084,000.00.

Commuter Tax Options (based on VMT to campus):

From survey, projected numbers for commute time and estimated round trip to campus:

# commuters	% S.O.V. drivers	Total # S.O.V.s to campus	Est. min. VMT, roundtrip/SOV	Est. Total Daily VMT
10 min/less = 5438	68	3698	2	7,396
11 to 20 min=8700	74	6438	6	38,628
21 to 30 min=7885	82	6466	10	64,660
31 to 40 min=3263	76	2480	20	49,600
41 to 60 min=1631	76	1240	30	37,200
60 min/plus=271	55	149	40	5,960
Totals		20,471		203,444

Thoughts on "Carbon Tax" Options (to reduce carbon and financially support bike facilities on campus):

- Price per S.O.V.
  - $ 5 x 20,471= $ 102,355
- Fee for those with parking pass (# parking passes sold for 2010-2011)
- Price per address/distance TO campus
  - One dollar per year/miles to campus daily: approx roundtrip VMT's = 203,444/2= $ 101,722
- Fee shared by all campus community regardless of mode of travel
  - 27,190 x $5 = $ 135,950
- Consider larger fee from those who actually produce larger footprint and don't tax walkers and riders.

Appendix J: Bike Parking and Regulations

Parking Permit and Registration Policies of other Universities

U of Kentucky:

Bike registrations: Had intended to have 15 dollar fee for registration but protests lead to dropping this fee; 4,500 registrations since 2009 when it started; allows contact of owners rather than cutting off locks and impounding bikes, return of stolen bikes, contacts for disseminating info and getting input.

Carpool registration and incentives: university offers three free rides home per year if carpooler has an emergency illness, etc. and needs to get home; priority close in parking lot spaces reserved for carpoolers. Min three members per carpool, min carpooling three days a week to campus, must commute at least one mile to campus; for students, faculty or staff of university only.

University of Oregon: bike reg. is free. Carpoolers get close in parking.

Indiana Univ.: 10 dollar one-time fee per life of bike.

EKU: don't seem to have any registrations.

WKU: Has full service bike shop on campus through intramural and recreational sports department located in their Health and Activities Center. Sell bikes, gear, accessories. Do repairs, tune-ups, and builds bikes. Have triathlon on campus. Don't seem to have registration fees.

Univ. of Wisconsin: (bike registration law for city of Madison)

> Madison City Ordinance 12.78(1) requires all bicycles used within the city's boundaries to be registered with the Madison Police Department unless they are currently registered with another municipality.
>
> Registration fees are $10.00 for four years. All unregistered bicycles are subject to fines up to $45.00.
>
> You can register your bicycle in person at the Transportation Services offices, either at the WARF Building (West Side of campus) or at the Welcome Center at 21 North Park Street. You can also register online at www.madisonpay.com.
>
> Fill out a mail-in form today. To view this form, you will need Adobe Acrobat Reader. You can find the Adobe Acrobat Reader at Adobe's website

UofL: Associated with the National Bike Registry through the National Crime Prevention Council. NBR gives free 24/7 internet access to data base with secure password. Get NBR ID label with serial number. Also get free educational material and media support. NBR website registration: Costs 10 dollars for ten years or 25 dollars for 30 years; Family registration is 25 dollars for ten years per bike up to 5 bikes.

Rules of the Road

The operation of a bicycle in the City of Louisville is governed by several state and local regulations: the Kentucky Revised Statutes (KRS), the Kentucky Administrative Regulations (KAR) of the Transportation Cabinet, and the Ordinances of Louisville-Jefferson County Metro Government. This page will **summarize** the rights and responsibilities of bicyclists as defined in these regulations, and is not intended as a comprehensive reference guide. Links to the full-text of the regulations are included on this page; please follow them for complete reference information.

Note: For information about laws pertaining to **mopeds**, go here and review Chapter 71: Traffic Laws. (Mopeds are covered in section 71.25.)

State Regulations:

The Kentucky Revised Statues (KRS 189.287) give the Transportation Cabinet the right to "promulgate bicycle safety regulations and standards." These regulations are defined in the Kentucky Administrative Regulations (601 KAR 14:020). The less obvious regulations are summarized below:

- You MUST use a front light when riding at night or whenever it is darker than usual (i.e. when it is heavily overcast). [See KRS 189.030(1) for description of when a light is required.]
- You MUST use a red rear reflector or light on yourself or your bicycle whenever riding on a highway or shoulder (definitions).
- At night or when overcast (as described above), you MUST use a steady or flashing red rear light.
- You MUST shout or sound a bell or horn when approaching a pedestrian or other bicycle.
- It is illegal to carry more passengers than the bicycle was designed to accommodate.
- You may not carry a package which prevents you from keeping at least one hand on the handlebars.
- It is illegal to attach yourself or your bicycle to another vehicle.
- Bicycles shall be operated the same as a motor vehicle EXCEPT for the following:
    - A bicycle MAY be operated on the shoulder of a highway.
    - If a bicycle lane is provided, it MUST be used whenever feasible.
    - **Not more than TWO bicycles may ride side-by-side in a single highway lane.**

Local Regulations:

KRS 189.287 states that riders and bicycles complying with the 601 KAR 14:020 regulations are exempt from the provisions of KRS 189.040(9), KRS 189.050(1), KRS 189.050(5), and KRS 189.080 (regarding lights and horns). Such bicycles and riders are also

exempt from municipal and other local government regulations concerning safety equipment but not method of operation." A number of local regulations apply to the operation of bicycles, defined in the local Traffic Code chapter on Bicycles and Motorcycles, TITLE VII, CHAPTER 74. This ordinance specifies more detailed usage restrictions than do state regulations. They are summarized here:

- **No person over 11 years old shall operate a bicycle on any sidewalk in Louisville Metro, and nobody of any age shall ride on the sidewalk downtown.**
    - This does NOT apply to officers of Louisville Metro Police Department, employees of Louisville Metro Emergency Medical Services, Louisville Fire and Rescue, the suburban fire protection districts, Louisville and Jefferson County Emergency Management Agency, nor to Downtown Management District Clean and Safety Team personnel, nor to private security personnel employed by hospitals located within the Downtown Form District, as long as they are acting within the scope of their official duties.
- Children are allowed to ride as passengers as long as certain conditions are met.
- No person shall operate a motorized vehicle on a designated bike path or bike lane.
    - Metro Government maintenance vehicles are exempted from this regulation.
- You MUST wear a helmet if you are under 18 years old and you are riding in any Metro Park.

In all other ways, bicycles are considered "vehicles" by the Kentucky and Local regulations and are subject to all rights and regulations of other vehicles. These include:

- **You must stop at all stop signs and red lights as must other vehicles.**
- You must pass on the left and make turns from the appropriate lane.
    - However you are encouraged to remain in an on-road bicycle lane even if it means you will pass some stopped traffic on the right.
- You must signal, using your hands (see the Bicycle Safety page for hand signals), lamps, or mechanical devices. The signal must be given intermittently for the last fifty feet before the turn.
- All slow moving vehicles must bear as far right in their lane as is safe and practical, including bicycles.
    - If there is on-road parking, a particularly narrow street, debris, or other hazards, you are allowed to claim as much of the lane as necessary to ride safely.

As stated in Section 70.03 (C) of the Traffic Code: "*Every person riding a bicycle* or an animal *on any roadway*, and every person driving any animal on any roadway, and every person driving any animal-drawn vehicle *shall be subject to the provisions of this traffic code applicable to the driver of any vehicle, except those provisions of this traffic code which by their very nature can have no application.*"

Please click here to view the entire Louisville Metro Traffic Code as it relates to bicycles.

Rules for Motorists Concerning Bicycles

Since motor vehicles and bicycles are both considered "vehicles" under the eyes of the law, there are rules which apply to motorists as well as to bicyclists regarding their behavior on the road.

Motorists MUST:

- Share the road with bicyclists.
- Before passing a cyclist:
  - Look to see if there is something in the right lane (debris, parked cars, drainage grates, etc.) that might cause the cyclist to divert their course to the left.
  - Pass only when you can allow at least three feet between yourself (as measured from the extent of your rear-view mirrors) and the cyclist.
  - Return to your lane only when completely clear of the cyclist.
- If you turn right after passing a cyclist, only do so if you leave enough room that his forward path is not obstructed.
- When opening your car door, look for cyclists in your rear-view mirror.

The information in the "Rules for Motorists Concerning Bicycles" section comes from the Kentucky Drivers Manual.

Impounded Bicycles

(source: University of Kentucky Policy used as prototype and comments by Justin Mog)
Impoundment means a motor vehicle or bicycle has been involuntarily towed or transported pursuant to KRS 376.275 to a compound or storage facility due to a violation(s) of these regulations, the KRS or subsequent to an arrest, and its removal has been ordered by the University of Kentucky Police Department or Parking & Transportation Services (PTS) and retained in custody pending payment of all citation, towing and storage fees.
Impoundment
The charge for impounding a bicycle is $40.
A storage fee of $2 per day will be charged in addition to all fines/impoundment costs, effective 24 hours after initial impoundment for a maximum of 15 days.
The University will remove locks or security devices and impound at the expense of the owner/operator, any bicycle that is:
Abandoned or inoperative for a minimum of five days
Reported as lost or stolen

Parked, stored, or operated in violation of these regulations
The University of Kentucky and PTS is not responsible for loss or damage of locks or security devices removed for bicycle impoundment.

11. Release Procedures for Impounded Bicycles
Required prior to the owner/operator attaining the release of an impounded bicycle:
Prepayment of all outstanding bicycle citations and impoundment fees by check, cash, Visa or MasterCard
Proof of ownership when deemed necessary
Bicycles unclaimed after 90 days will be disposed of according to University Regulations.
Even though a bicycle owner may choose not to claim an impounded bicycle, all citation, storage and impoundment fees owed the University must be paid in full or the owner risks a hold to be placed on his/her records and account(s)."
PROCEDURE:
I've been told by UK's Sustainability Coordinator that the typical procedure for identifying abandoned bikes (beyond those reported to them) is that soon after the end of the academic year, their PTS officers tie easily-breakable flagging tape between all bike wheels and the thing to which they are locked. If the tape remains for a five days, they know the bike is abandoned and impound them.

Reasonably functional bikes which are never reclaimed from impoundment are repurposed for the Wildcat Wheels program (http://www.uky.edu/HR/wellness/wildcatwheels.html) to provide free loaner bikes to students and employees on campus. I'd love to see us move toward that model as well, but it certainly is not necessary to have that set up prior to implementing an abandoned bicycle policy and procedure. Unclaimed bikes could simply be auctioned or donated to other organizations.

Appendix K: Local Bicycling Organizations

- Bicycling for Louisville is Louisville's non-profit bike advocacy and education organization
- CART -*The Coalition for the Advancement of Regional Transportation*
- Metro Louisville's Bike Louisville
- Louisville Bicycle Club (formerly Louisville Wheelmen)
- The Kentucky Mountain Biking Association
- Southern Indiana Wheelmen

Additional Bike Organization Contacts

- Humana Inc. Corporate Communications; Doug Bennett 502 580 3625 dbennett@humana.com
- Bikes Belong; Tim Blumenthal 303 875 9222, Tim@bikesbelong.org.

UofL Bicycle Network Partners:

- Get Healthy Now
- Campus Health Promotion
- Student Government Affairs
- Sustainability Council
- Vice-President for Business Affairs
- University Planning, Design & Construction