



MORGAN STATE UNIVERSITY

BICYCLE MASTER PLAN



ACCESS



FACILITIES



CULTURE



 TND Planning Group

NOVEMBER 2014

ACKNOWLEDGEMENTS

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Dr. David Wilson, President
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Re: Morgan State University Bicycle & Pedestrian Master Plan

Dear Dr. Wilson,

I congratulate you on Morgan State University's adoption of a new Bicycle & Pedestrian Master Plan. As a graduate of Morgan State (2012, M.C.R.P.) and a bicycling advocate, I am proud to know that my alma mater, out of all the other prestigious institutions of higher learning in Baltimore, is showing such outstanding leadership on providing high-quality facilities for bicycling and walking. Once implemented, generations of Morgan State students to come will benefit from enhanced health and lower transportation costs as bicycling is normalized as a mainstream way to get to and around campus.

The plan is important not just for Morgan State's future, but for Baltimore's as well. The plan includes a vital north-south connection through the Morgan State campus between Lake Montebello and Northern Parkway; as this path becomes a better-known part of Baltimore's bicycling infrastructure, the University's stature will only grow as the general public enjoys Morgan State's beautiful campus.

Again, on behalf of Bikemore, I thank you for your leadership on this issue and hope to see this plan implemented over the coming years.

Sincerely,

Chris Merriam
Executive Director, Bikemore



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The new majority that elected a president — youth, women and people of color — is playing a key role in pedaling the country toward a more Bicycle Friendly America. These diverse communities are embracing bicycling at a high rate, redefining the face and trajectory of the bicycle movement and the way the nation addresses transportation.

***The New Majority
Pedaling Towards Equity***
The League of American Bicyclists and Sierra Club



Chapter One

INTRODUCTION

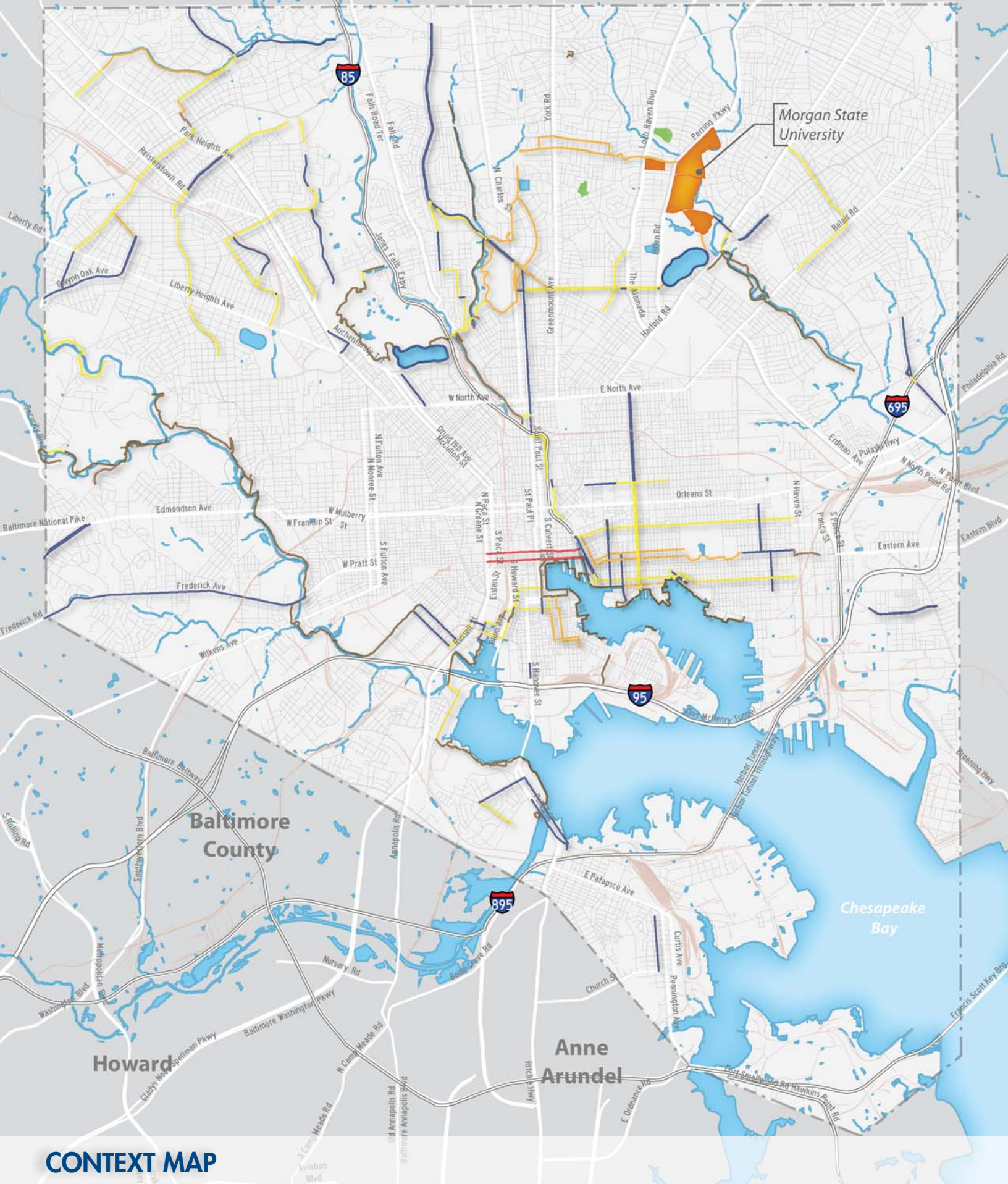
Project Overview

Morgan State University has embarked on a planning study to examine the physical composition of the campus and complete a new master plan that will guide the University through the next ten years. This Master Plan will address growth and development in anticipation of the cultural changes and increased population of students, faculty, and staff. In conjunction with the Master Plan, this Bicycle Master Plan will provide guidance for circulation patterns in and around the campus, policies to support bicycling, and programs that support and encourage people who are interesting in biking for recreation and transportation.

Recent years have seen a general rise in the rate of bicycling in many campuses and cities around the United States. Bicycling is a low-

cost travel method which can reduce trip times and provide useful connections to existing transit systems. Nationally and in Maryland, many institutions of higher education have been promoting and providing facilities, programs, and enforcement to create a bike friendly environment for students, faculty, staff, and visitors.

This Bicycle Master Plan provides Morgan State University (MSU) with an assessment of current bicycling conditions, a review of similar campus practices to increase bicycle mode share, and an implementation plan for encouraging bicycling to the University and around the campus. The Plan will provide a trail map that will promote a bicycle friendly environment and prepare MSU to apply for the League of American Bicyclists Bicycle Friendly University (BFU) status.



CONTEXT MAP

Bike Facilities

- | | |
|--|--|
| — Existing Bike Lane | — Existing Shared Bus-Bike Lane |
| — Existing Sharrows | — Existing Multi-Use Path |
| — Existing Bike Route | - - - Baltimore City Limits |



0 1 2 Miles

Study Area

Morgan State University is a Historically Black University (HBCU) in Baltimore, Maryland. MSU is Maryland's designated Public Urban University and the largest HBCU in Maryland. As of 2013, the University's population was composed of 4,886 student commuters, 2,660 student residents, 445 faculty members and 1,513 staff members. The University serves and educates a culturally and ethnically diverse population and makes a priority of enrolling a student body that is broadly representative of the City of Baltimore's population. The University provides a supportive environment for students, focusing on academic integrity, innovative research, and service to the community. Creating a safe and accessible bicycling environment will enable students, faculty, staff and visitors to access the campus along a connected network of comfortable facilities. Bikeways, end-of-trip facilities, and programming will encourage bicycle use, thereby increasing personal health, decreasing transportation costs, and alleviating vehicular congestion in and around campus.

The Campus is approximately 143 acres, less than one half mile east/west, and just over one mile from the northern to southern extents. This size promotes a walkable environment and one that is quickly navigated by bike. Existing topographic challenges are alleviated with pedestrian bridges spanning East Cold Spring Lane and Chinquapin Run.

MSU is located in the northeastern quadrant of the City of Baltimore, approximately 4 miles north of the Inner Harbor. Its location within the City of Baltimore, and proximity to Johns Hopkins, Loyola University Maryland, and Notre Dame of Maryland University underscore the importance of safe connectivity for bicyclists.

Many universities have built upon local enthusiasm for bicycling by creating partnerships with local advocacy groups, working closely with the city, creating student and staff encouragement programs, implementing bicycling education classes, and adopting policies to promote bicycling as a preferred means of transportation. Building on these efforts, the League of American Bicyclists created the Bicycle Friendly University (BFU) program which recognizes institutions and provides a trail map and technical guidance to create great campuses for bicycling. The BFU program will provide a framework for improving the context and campus of MSU.

Vision, Goals, and Objectives

The Project Vision Statement and recommended goals and objectives for the MSU Bicycle Master Plan were developed by researching existing national, state, and university goals, policies, and objectives. The Vision Statement will guide the development and implementation of the Morgan State Bicycle Master Plan. This statement outlines the overall view of bicycling policies, physical network, and culture. This will serve as an inspiration for continuing the effort to improve facilities and programming on the campus.

VISION

Morgan State University will strive to create and improve policies, programming, and infrastructure to encourage students, faculty, staff, and visitors to choose bicycling as a mobility choice. Planning and implementation will continue to enhance knowledge, safety, connectivity, and comfort for experienced and inexperienced bicyclists. The University will work with the City, other Universities, and advocates to create a bicycle friendly environment within and surrounding the campus.

Goals and objectives should support MSU's vision and describe the most important aspects of programs, priorities, and attitudes.

Goals for the MSU Bicycle Master Plan are:

- **Health and Safety** - Provide and promote safe and accessible routes and accommodations for biking as a daily mobility choice.
- **Education and Encouragement** - Implement education and encouragement programs targeted at students, faculty, staff, and visitors.
- **Enforcement** - Improve enforcement of multi-modal behavior on campus.

- **Transit Integration** - Improve the connection between bicycle routes and transit routes in and around campus.
- **Implementation** - Create a campus non-motorized network that is integrated into existing and future off-campus facilities. Institutionalize non-motorized mobility choices in all campus planning, design, and construction activities.
- **Accountability** - Monitor implementation of the MSU Bicycle Master Plan.

Plan objectives are to:

- Create a bicycle network - *Identify an on- and off-campus network and provide connectivity throughout the Morgan State University catchment area.*
- Develop implementation strategies and priorities for future bicycle facilities and programs - *Work with MSU staff and include input from the student population to develop strategies and priorities for implementing future facilities and programs.*
- Provide guidance for a future BFU application for MSU - *Address the 5 E's of the League of American Bicyclists' Bicycle Friendly University (Engineering, Education, Encouragement, Enforcement, Evaluation and Planning). Incorporate these elements into Plan recommendations.*
- Identify funding opportunities – *Prepare a list of potential funding opportunities suitable for bicycling facilities and programs.*
- Provide prioritization for future capital projects - *Develop a project prioritization framework based on the Plan's goals and objectives.*
- Plan to incorporate bicycle recommendations into the Campus Master Plan - *Dovetail recommendations in both plans for ease of implementation by MSU staff.*

Existing Plans and Policies

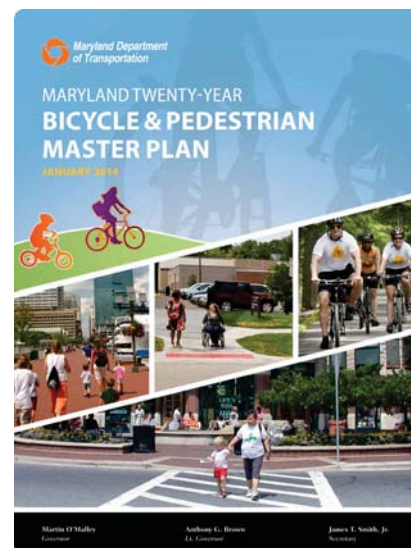
STATE OF MARYLAND

MARYLAND TWENTY-YEAR BICYCLE & PEDESTRIAN MASTER PLAN

The *Maryland Twenty-Year Bicycle & Pedestrian Master Plan* was published in 2014 by the Maryland Department of Transportation (MDOT). The document creates a series of objectives to promote walking and bicycling. These objectives encompass several topics, including educational opportunities, funding, incentives, and marketing initiatives. Specific goals include increasing the use of bicycles en route to universities and creating an environment in which bicycle use is seen as a typical mode of transportation. The following are excerpts that pertain to schools, colleges, and universities.

Objective 3B: Increase professional capacity to effectively plan, design, implement, and maintain infrastructure for bicycling and walking.

- Support and encourage educational opportunities for local leaders and elected officials as well as students in the transportation engineering and planning fields related to bicycle and pedestrian accommodation.



Objective 4A: Provide assistance and incentives to local governments to improve biking and walking.

- Provide funding support and technical guidance for the development of local bicycle and pedestrian plans and projects.
- Support efforts to share successful bicycle and pedestrian policies and guidelines and educate partners about available resources for models and case studies.
- Encourage local jurisdictions to identify desired bicycle and pedestrian facilities in comprehensive plans, and then to secure those facilities through private development and other opportunities.

Objective 4B: Improve coordination between state agencies, and with local governments to support bikeable and walkable communities.

- Promote siting and design practices that encourage biking and walking to public facilities (schools, medical centers, state offices, etc.) and increase connectivity and access to and within adjacent neighborhoods.

Objective 4C: Support efforts to increase biking and walking to schools, colleges, and universities.

- Encourage local public school officials to support biking and walking to school, by providing reference materials, bike racks at schools, and supporting bike-to-school day programs.
- Provide infrastructure that supports safe bike and walk access for students, faculty, staff, and visitors.
- Work with the University System of Maryland and post-secondary institutions of education to improve walk and bike access to and within their campuses and ensure compliance with § 21-1008(b).
- Encourage Maryland communities, businesses, and universities to pursue Bicycle Friendly and Walk Friendly awards.

Objective 5A: Promote bicycling and walking as normal transportation modes to a broad diversity of participants.

- Develop marketing initiatives to promote bicycling and walking in key target audiences (urban commuters, colleges and universities, employers, women, economically disadvantaged, ethnic minorities, and non-English speakers).

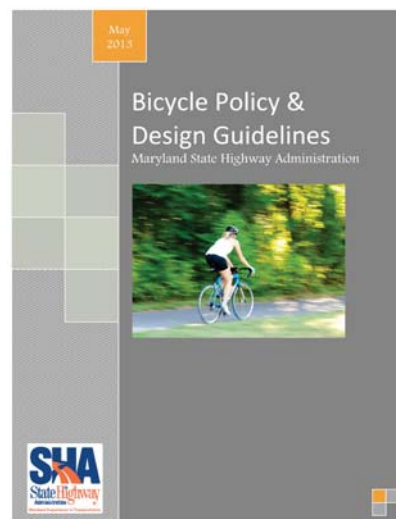
Objective 5C: Support growth in bicycle tourism in Maryland. (Note: not specifically related to universities or schools, but could be applicable in the future).

- Support biking and walking improvements to help communities near major trails leverage economic benefits of trail tourism.
- Coordinate with local jurisdictions to support designation of US Bicycle Routes through Maryland in coordination with State Bicycle Routes.

Source: <http://www.mdot.maryland.gov/bikewalkplan>

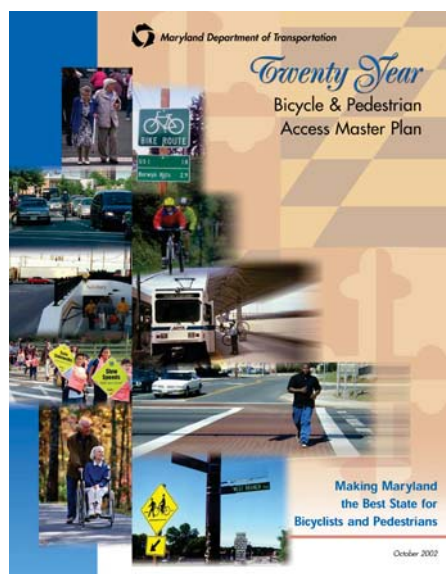
BICYCLE POLICY & DESIGN GUIDELINES

The *Bicycle Policy and Design Guidelines*, published in 2013 by the Maryland State Highway Administration (SHA) includes guidance on bicycle related policy and facility design. This document provides support for the importance of including bikeways in roadway design and the responsibility of engineers and designers to create safe spaces for all modes to interact. Both on- and off-road facilities are addressed with illustrations and narrative to describe appropriate conditions for bikeways, crossings, and conflict points. Policies and definitions are also included to provide a concise source for policy, design, and implementation that is approved and support by SHA. This tool should be used in conjunction with the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities* and the National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* when designing facilities.



Source: http://roads.maryland.gov/ohd2/bike_policy_and_design_guide.pdf

20 YEAR BICYCLE AND PEDESTRIAN ACCESS MASTER PLAN



The *20 Year Bicycle and Pedestrian Access Master Plan*, published in 2002 by the Maryland Department of Transportation (MDOT), provides information about actions MDOT has taken or is taking to promote safety for bicyclist and pedestrians. The Plan specifically identifies strategies, such as Safe Routes to School programs, to encourage safe bicycling behavior for elementary and grade-school students. These programs initiate proper behavior in young students that should prepare them better for riding as college age young adults. The plan also identifies university-specific research and educational opportunities that can promote bicycle use and awareness. The following are excerpts that pertaining to schools and bicycling.

Goal 3: Safety

Provide safe and convenient bicycle and pedestrian accommodations for every type of trip, and for all levels of ability.

STRATEGY 3A: Coordinate Education, Engineering, and Enforcement Safety Activities. Studies have shown that the most effective traffic safety initiatives are those that integrate engineering, education, and enforcement at both the programmatic and project level. For examples, successful Safe Routes to School programs include making modifications to the streets around schools, education and training the students how to walk and bike safely to school, and enforcing the traffic laws for all street users in and around school zones. Full implementation of this strategy will require the active participation of Maryland schools, State agencies other than the Maryland Department of Transportation, the General Assembly, and local governments to develop and implement new safety programs and campaigns.

ACTIONS:

- In coordination with the Maryland Bicycle and Pedestrian Advisory Committee, Maryland Department of Education and local schools, assess the potential of a Safe Routes to School program.
- Encourage the Department of Education and local schools to integrate pedestrian and bicycle safety into English as second language classes.

Goal 4 - Education, Encouragement, and Awareness

STRATEGY 4D: Create new forums for learning, dialogue, and research.

ACTIONS:

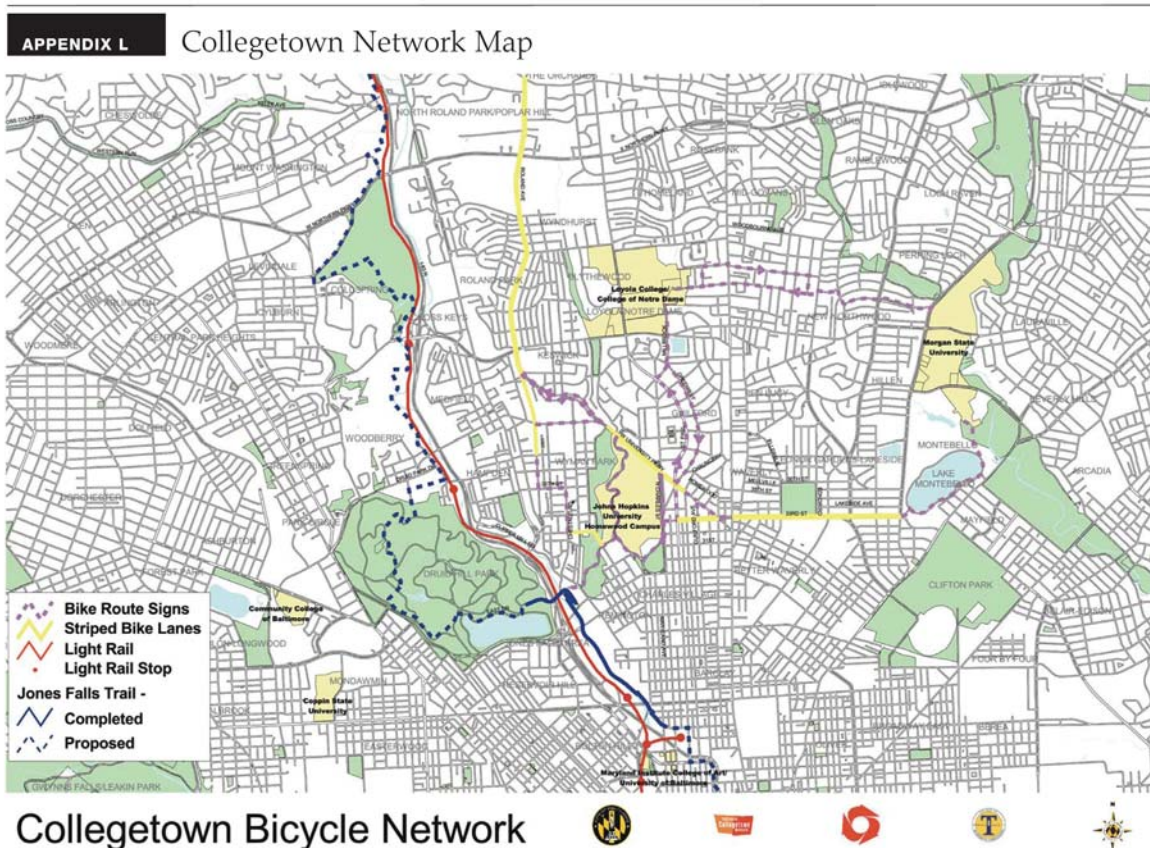
- In partnership with the Maryland Transportation Technology Transfer Center establish a pedestrian and bicycle transportation seminar series for college students and professionals at MDOT and other professionals working in the field of bicycling, walking, and traffic safety.
- In partnership with one or more universities, establish a statewide institute for bicycle and pedestrian research and technology transfer program to conduct policy research and identify cutting-edge bicycle and pedestrian technology and treatments and procedures that can be evaluated, tested, and applied in Maryland.

Source: http://www.mdot.maryland.gov/Office_of_Planning_and_Capital_Programming/Bicycle/Documents/FINALB.PDF

BALTIMORE CITY BICYCLE MASTER PLAN (2006)

Baltimore City's *Bicycle Master Plan*, published in 2006, proposes the creation of an interconnected bicycle network across the city. One component of this plan includes the creation of bicycle routes in and around Morgan State University. The plan also highlights key intersections throughout the city that can benefit from improvements to promote bicycle safety and minimize conflicts between motorists and bicyclists. One such intersection is located on the perimeter of Morgan State University's campus, at the intersection of Perring Parkway and Hillen Road. The following are excerpts that pertain to schools, colleges, and universities.

- Bike routes proposed to be implemented on Morgan State University campus. The Collegetown Bicycle Network Map shown below highlights where these improvements should take place.



- The proposed bike routes are considered a primary priority, as part of either Tier 1 or Tier 2 on-street facilities and routes, intersection improvements, off-street connectors, and primary trails projects. These projects were slated to occur between 2006 and 2010.
- Improvements are needed at Perring Parkway and Hillen Road intersection.
- While some universities have bike racks and lockers, many racks are substandard and should be improved.
- The City has a goal to install 100 racks per year. The Plan recommends that racks be installed at public schools, libraries, and other key destinations.
- Recommends establishing rental bike stations at college campuses, similar to a bikeshare station.
- Recommends promoting bicycling for commuting, errands, socializing, and exercising.
- Recommends creating a program to target higher education, city government, and other employers to encourage bicycle commuting to work or school.

Source: <http://www.baltimorecity.gov/Government/AgenciesDepartments/Planning/MasterPlansMapsPublications/BicycleMasterPlan.aspx>

MORGAN STATE UNIVERSITY STRATEGIC PLAN

Neither the 2008-2012 *Strategic Plan* nor the 2011-2012 *Strategic Plan* provides any reference to bike culture, policies, or infrastructure on Morgan State University campus. However, MSU does have an unwritten policy to install bicycle racks at all buildings campus-wide.

What It Means To Be Bicycle Friendly

Bicycle Friendly designations are awarded to states, communities, businesses, and universities. It is a reflection of a commitment to healthy transportation, safe environments, and efficient transportation choices.

Universities are ideal bicycle friendly environments due to their density of the built environment and population. Circulating throughout campuses via bicycle is often more efficient than using a personal vehicle. Increased bicycling optimizes limited space, saves the university money spent on parking and healthcare, and provides affordable transportation options for students, faculty, staff and visitors. Many students often seek a university with quality bicycle facilities and therefore, a bike friendly environment can become a draw for new students.

Being bicycle friendly is more than quality pathways and safe crossings - it is a culture. To foster a culture that supports the integration of bicycling into transportation, the University must also provide end-of-trip facilities, encourage ridership through programming, offer education, and enforce bicycling policy.

The League of American Bicyclists provides a framework for the built environment and culture by focusing on five primary areas: engineering, encouragement, education, enforcement, and evaluation/planning.

The Five E's

While every campus is different - in context, climate, student composition, and culture - the five E's serve as a standard across all universities to determine and evaluate the level of bicycle friendly status.

These five E's will be used to evaluate Morgan State University and provide recommendations for improving the campus and culture.

THE FIVE E'S	DESCRIPTION
Engineering	<p>Bicyclists, by their nature, are much more sensitive to poor facility design, construction, and maintenance than motorists. The most visible sign of a welcoming place for bicycling is the presence of high-quality and well-maintained infrastructure including:</p> <ul style="list-style-type: none"> • A well-connected bicycling network • Conventional and protected bike lanes and shared use trails • Policies to ensure connectivity and maintenance of these facilities • Secure, convenient, and readily available bike parking - as well as showers and locker facilities.
Education	<p>Educating students and staff is key to building a safe and supportive bicycling culture and includes:</p> <ul style="list-style-type: none"> • Bicycle safety education and confident riding training • Online tips, rules, regulations, and tools • Information about rights and responsibilities for all road users.
Encouragement	<p>A supportive bicycling environment where staff and students are encouraged to consider riding can be very effective in increasing participation. This can be readily implemented by providing a variety of fun opportunities and incentives to choose biking for transportation trips:</p> <ul style="list-style-type: none"> • Bike Challenges, National Bike Month, and Bike to Work Day • Wayfinding tools like producing maps, route finding signage, and mobile apps.
Enforcement	<p>An effective bicycling environment has rules and regulations that are understood and enforced fairly and appropriately and address the safety of all road users and include:</p> <ul style="list-style-type: none"> • Updated rules and regulations • Fair and equitable enforcement and trained law enforcement officers • Partnerships, programs, and communication • Theft prevention and enforcement
Evaluation	<p>Evaluation: Measuring and benchmarking is a necessary component of understanding and running a successful bicycling program and includes:</p> <ul style="list-style-type: none"> • Understanding trips and bicycling participation rates • Evaluating facilities, their performance, and usage • Tracking bike thefts and crashes.

African Americans were more than twice as likely as whites (38% versus 14%) to agree that their perception of bicyclists would improve if people on bikes represented a “broader cross section of Americans, such as women, youth and people of color” in their community.

*Princeton Survey Research Associates, September 27-30, 2012,
Omnibus survey*



Chapter Two

EXISTING CONDITIONS

Bicycle Friendly University Audit

Using the Five E's as a framework is the best method for gauging current conditions in and around campus as well as planning for future improvements. An audit was completed according to the current Bicycle Friendly University (BFU) application and used to assess existing conditions of facilities, planning, policy, and programming.

Morgan State has a variety of resources and programs that share similar mission objectives and goals as the Bicycle Plan. Benefits of bicycling on campus include decreased demand on parking, decreased vehicle emissions with increased bicycle mode share, increased health benefits, and in many cases increased transportation efficiency. The Design and Construction Management Department focuses on creating sustainable features on campus and includes safety as an integral component of the Department's mission. Several other departments, including the School of Community Health and Policy, focus on the health of the campus and surrounding community. Transportation efficiency and cutting edge solutions are highlighted by the School of Engineering's Transportation and Urban Infrastructure Studies Programs. The School of Architecture

and Planning also includes classes that focus on urban infrastructure, human health, and environmental impacts. These resources – both staff and faculty – can be utilized to participate in the effort to implement the recommendations of this Plan.

As the first Bicycle Plan for the University, it is not surprising to discover limited resources are being dedicated to bicycle transportation on campus. Morgan State University has a relatively small footprint, making it is easy to travel from the northern to southern extents of the campus by walking. This walkability may contribute to the small biking mode share. Other cultural factors and facility limitations also contribute to the lack of bicycles observed around campus. In fact, African Americans were more than twice as likely as whites (38% vs 14%) to agree that their perception of bicyclists would improve if people on bikes represented a "broader cross section of Americans, such as women, youth and people of color" in their community¹.

The following tables, maps, and photos illustrate elements found within the League of American Bicyclists Bicycle Friendly University

¹ Princeton Survey Research Associates, September 27-30, 2012, Omnibus survey



- | | |
|--|---|
| 1. Carter-Grant-Wilson Administration Building | 31. Marshall Apartment Complex |
| 2. O'Connell Hall | 35. Clarence M. Mitchell, Jr. School of Engineering |
| 3. Baldwin Hall | 36. Communications Center |
| 4. Cummings House | 37. Rawlings Dining Facility |
| 5. Carnegie Hall | 38. Hughes Memorial Stadium |
| 6. Washington Service Center | 39. Rawlings Residence Complex |
| 7. Harper House | 40. Alumni House |
| 8. Holmes Hall | 41. Montebello Complex |
| 9. Spencer Hall | 42. Post Office |
| 10. Hurt Gymnasium | 43. William Donald Schaefer Engineering Building |
| 11. Richard N. Dixon Science Research Center | 46. Turner Armory |
| 12. Student Center | 47. Earl S. Richardson Library |
| 13. Parking Garage Student Center | 48. James E. Lewis Museum of Art |
| 14. President's Residence | 49. Christian Center |
| 15. Banneker Hall | 51. Helen Roberts Faculty-Staff Dining Room |
| 16. Blount Towers | 52. FUTURE Business School Complex |
| 17. Truth Hall | 53. BSC Parking |
| 18. Tubman House | 55. FUTURE CBEIS Parking |
| 21. Calloway Hall | 56. Power Plant |
| 22. Woolford Infirmary | 57. Washington Service Center Service Building |
| 24. McKeldin Center | |
| 25. Murphy Fine Arts Center | |
| 26. Key Hall | |
| 27. McMechen Building | |
| 28. Hill Field House | |
| 29. Soper Library | |
| 30. Jenkins Behavioral Science Building | |

EXISTING CONDITIONS

Existing Bike Lane	Planned Multi-use Trail	Open Space
Existing Sharrows	MSU Bear Transit Stop	University Buildings
Existing Bike Route	MTA Bus Stops	Morgan State University

0 250 500 Feet

Application. Morgan State may wish to apply for status as a Bicycle Friendly University in the future. Conducting a yearly Bike Friendly self-audit is a valuable tool to gauge potential success of being awarded recognition and serves as a barometer for how successful the campus effort is evolving to provide a safe, comfortable atmosphere for bicycling.

Campus Context and Profile

The juxtaposition of MSU within the City of Baltimore, transit connections, the topography, and culture must be examined to understand how the campus fits within its surroundings. It is also imperative to explore where people live and discover how they travel to campus.

The location of the campus provides students, faculty, and employees a range of transportation options and infrastructure throughout Baltimore. Public transportation options include connections via light rail, metro (although a limited system), and bus. Maryland Transit Administration (MTA) buses are equipped with bike racks to accommodate longer trips. The physical setting of the City varies, with some relatively flat travel ways and some steep terrain. The campus includes a few pedestrian bridges to improve circulation and efficient travel times across extreme elevation changes. Baltimore is making headway toward becoming a more bike friendly city. With Bronze status, the City is making improvements toward better facilities, programs, enforcement, and evaluation on the way to Silver status.

These contextual elements provide an environment with opportunities and

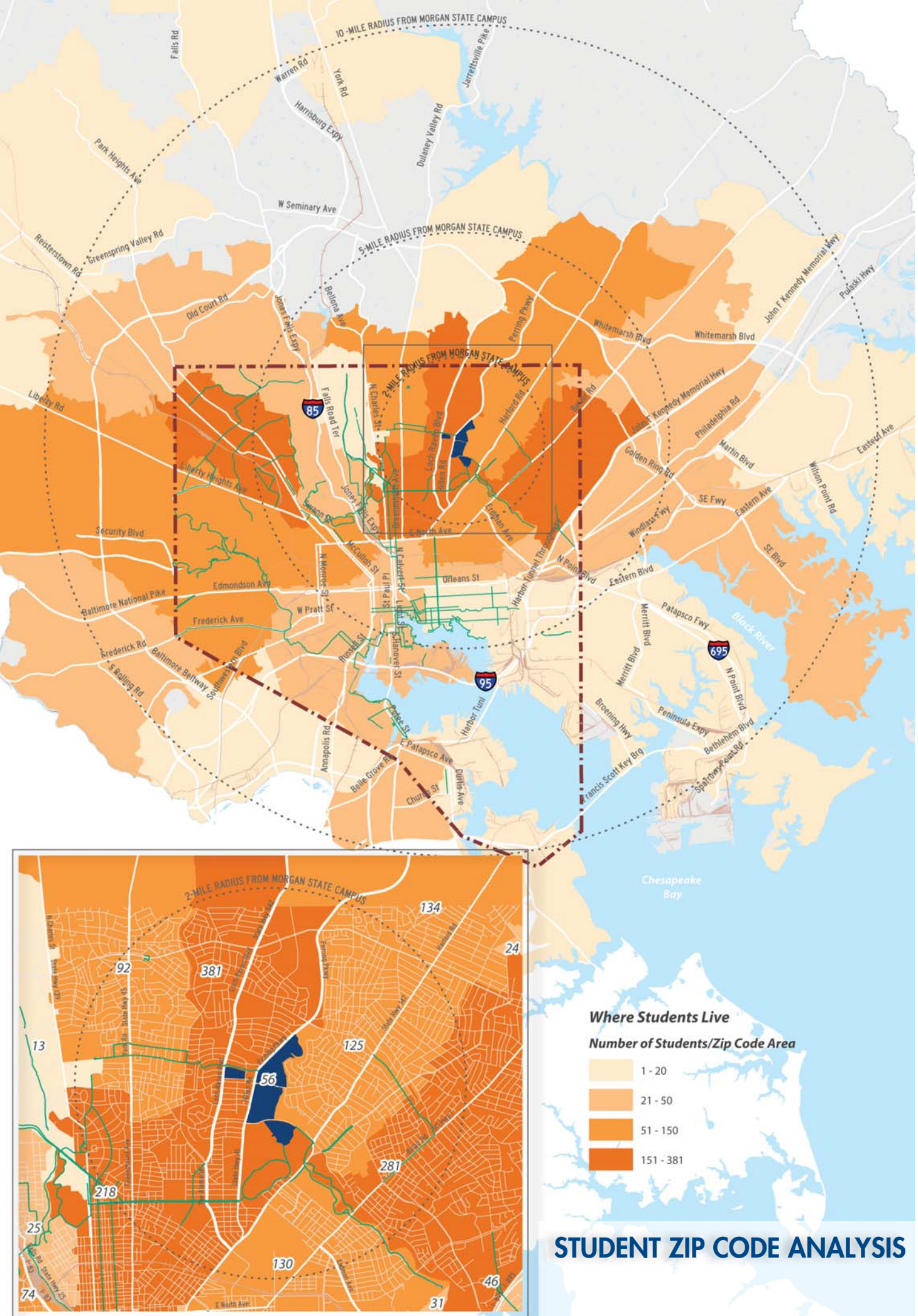
challenges for MSU. The City's efforts to add more bicycle facilities, particularly around the campus, will improve access to MSU. The addition of new educational and safety programs by local advocacy groups available to students and faculty will contribute to well informed bicyclists and motorists. Topography can be a challenge, but facility improvements such as climbing bike lanes, can provide protected, comfortable places for bicyclists at slow climbing speeds. Cultural perspectives, including cars as status symbols, and expectations that riding a bicycle requires specific clothing, can be modified by education and awareness campaigns.

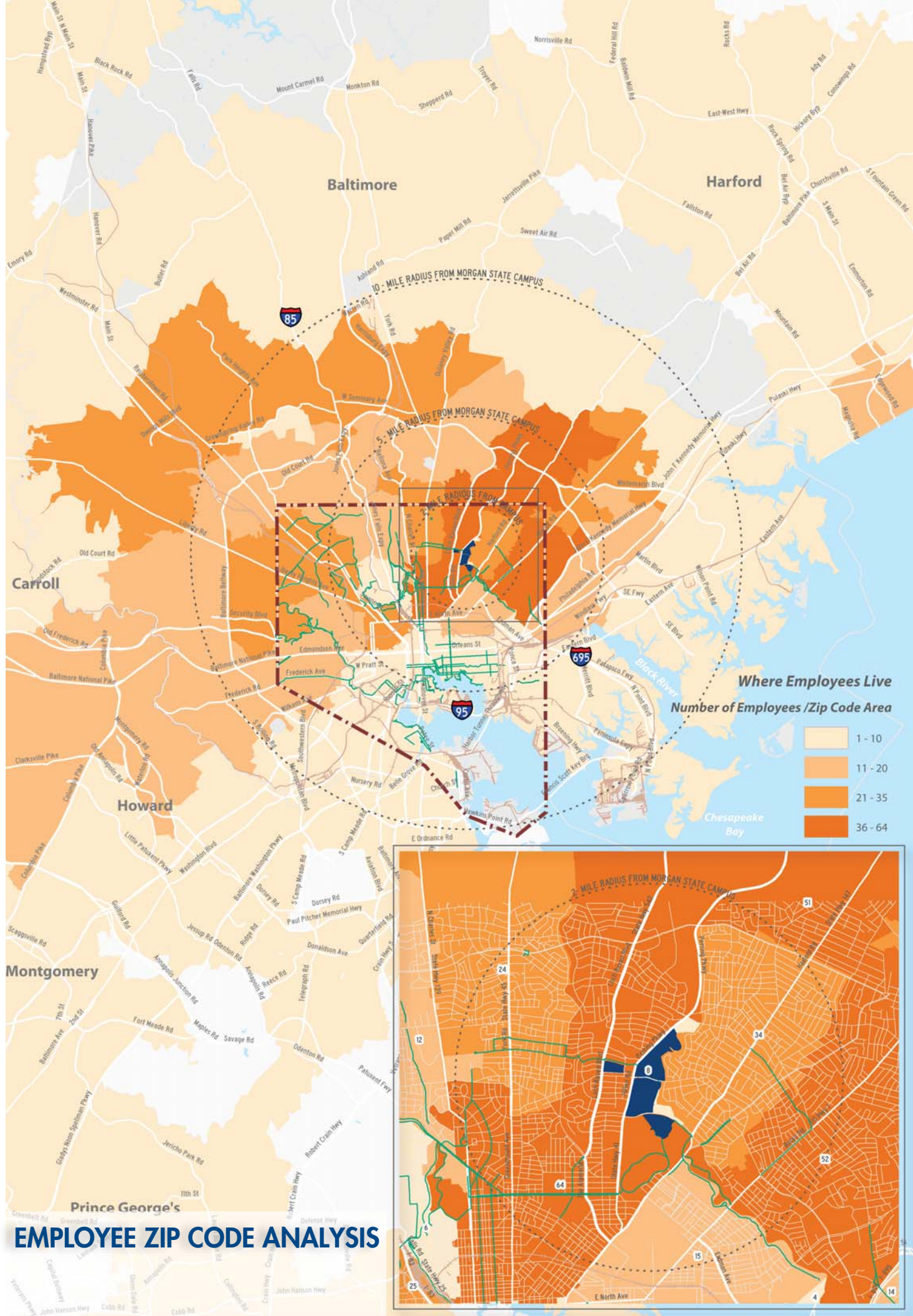
The map on page 2-3 illustrates existing bicycle facilities in the immediate vicinity of MSU. Connections proposed in plans adopted by the city are shown with dashed lines. Transit stops are also included. Routes from each stop to the campus should be safe and accessible.

Students, faculty, and staff live both within campus and outside of the campus in Baltimore and nearby counties. A zip code analysis of where students live is shown on page 2-5. This indicates concentrations of student homes and emphasizes the importance of providing safe routes within the city that connect to the campus. Page 2-6 illustrates concentrations of faculty and staff residences.

The chart below provides a snapshot of the profile of MSU as would be indicated on a League of American Bicyclists BFU application. The Profile covers population, mode share, BFU history, staff, budget, and web presence.

CATEGORY/QUESTION	STATUS
Setting/Context	Urban, large city
City Population	621,342
Student Population	7,952
Faculty Staff Population	1,993
Bicycle Mode Share <i>(The percentage of travelers using a particular type of transportation, in this case bicycles, or number of trips using said type)</i>	Very low. Not measured.
Previous BFU application submission?	Not At This Time
BFU Status	Not At This Time
Bicycle Program Manager/Staff	Not At This Time
Bicycle program webpage	Not At This Time
Bicycle Program budget	Not At This Time





Engineering: Infrastructure and End-of-Trip Facilities

While the existing network is limited, there are many opportunities in and around the campus. The following pages illustrate existing conditions that work well, opportunities for improvement, and challenges to bicycle circulation and culture.



Working Well



Opportunity



Challenge



This demand path indicates a potential location for a bike path to bypass pedestrian traffic.



Topography and steps are a challenge for bicyclists.



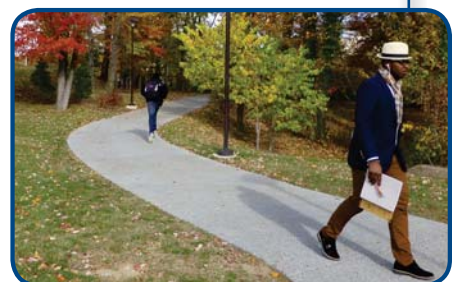
Parking complies with national standards and is on a concrete pad.



Pentwood Road is an existing bike route but lacks intersection markings or safety measures for bicycles and pedestrians.

Enhancing the entry monument and intersection can indicate to drivers, this is a bicycle and pedestrian environment.

This path could be widened in the future to accommodate bicycles and pedestrians.





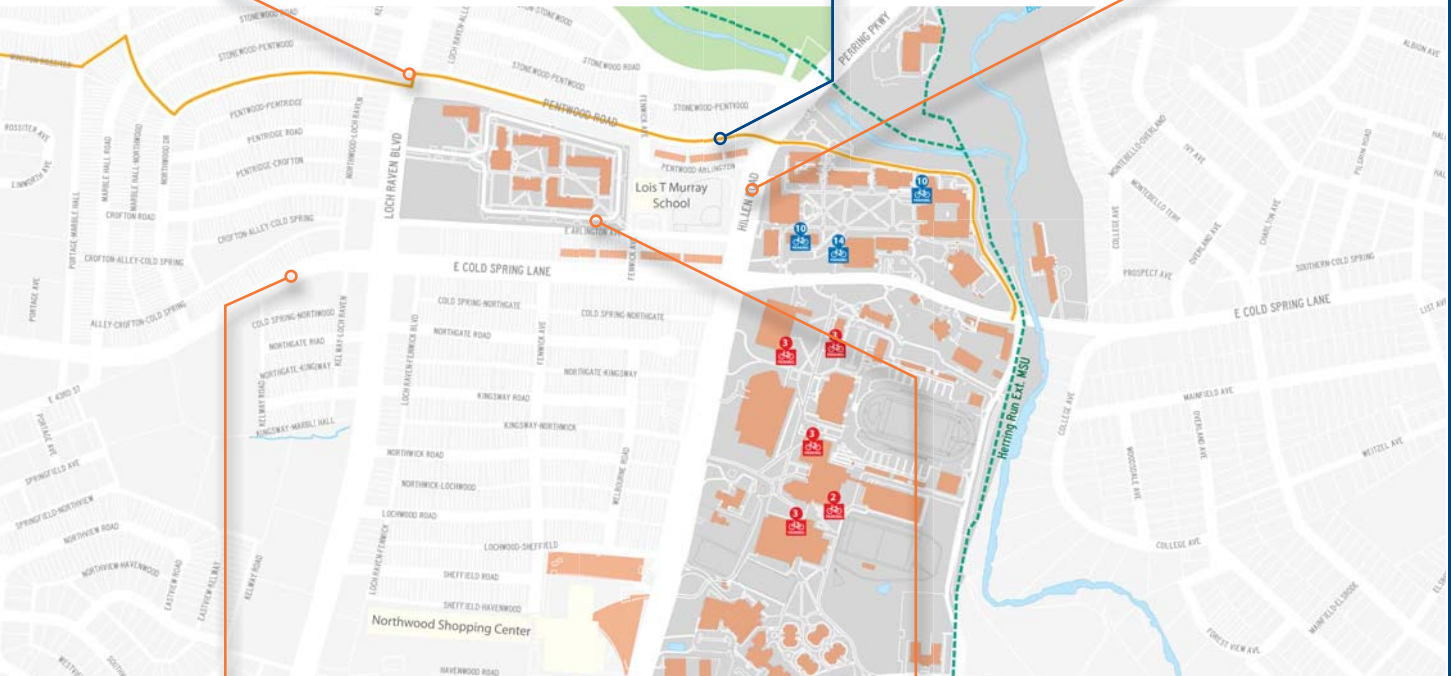
Pavement markings added to Pentwood will emphasize to motorists and bicyclists that it is an official bike route.



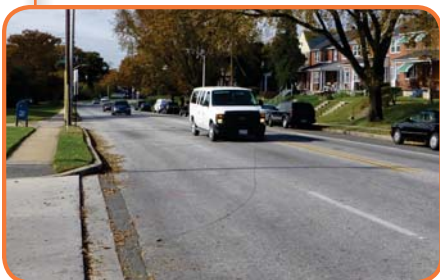
Fixing curbs to align in the direction of travel provide refuge. Protected bicycle facilities on Hillen Road would improve circulation.



Crossing is difficult due to the width and skewed intersection.



East Cold Spring Lane connects centrally with campus but does not have bicycle facilities.



No bicycle parking is available within the gates of Morgan View.





A shortage of bicycle parking leads to inappropriate, and potentially unsafe parking.



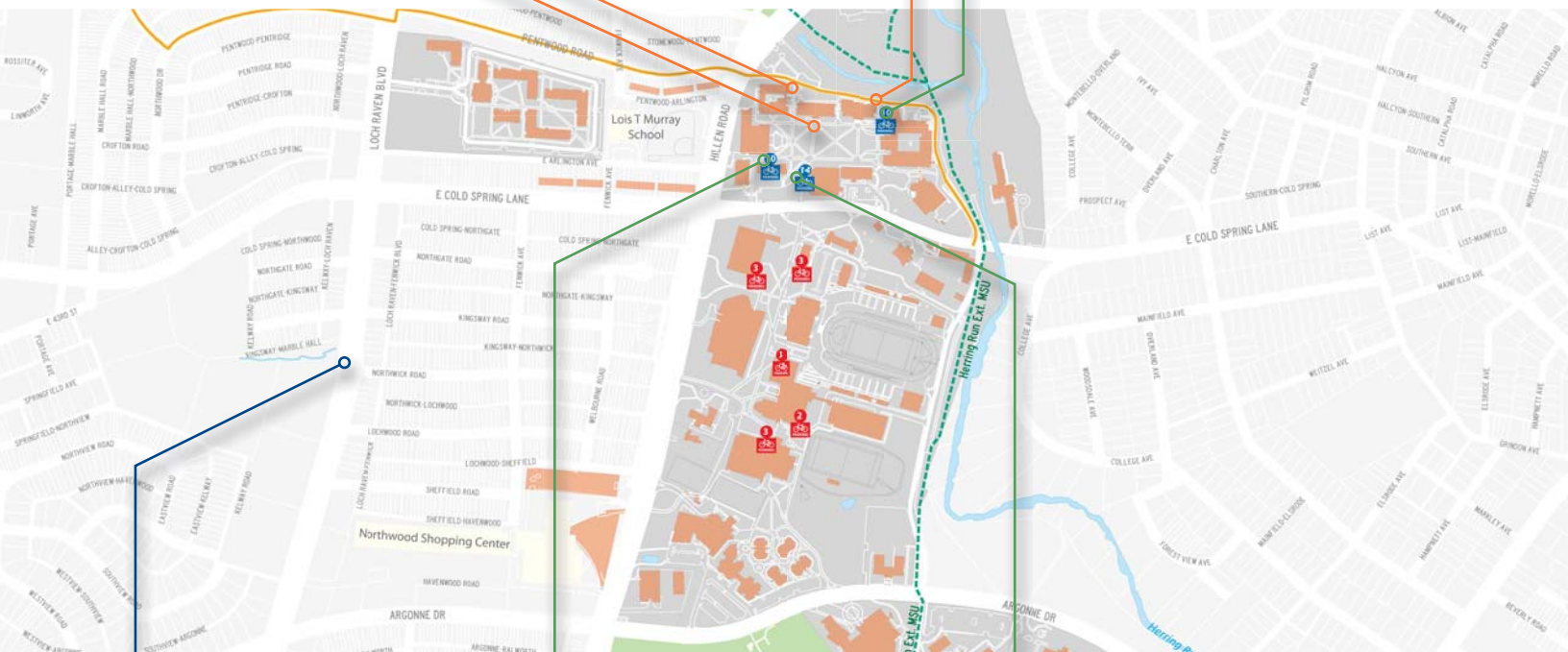
Steep stairs create gaps in the bicycle network.



Narrow stairs constrain improvements such as runnels (channels for bike tires, see page 5-12 for photo).



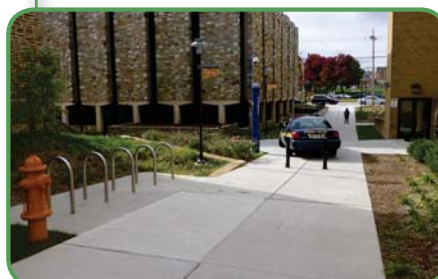
New bicycle parking provides end of trip facilities.



The median on Loch Raven Boulevard presents an opportunity for a multiuse path.

Bicycle parking, as shown here, is set back from the sidewalk allowing full clearance of the path.

Ramps, with ample width for bikes and pedestrians, provide important network connections.





Adding separate facilities for bicycles will improve conditions for all modes.



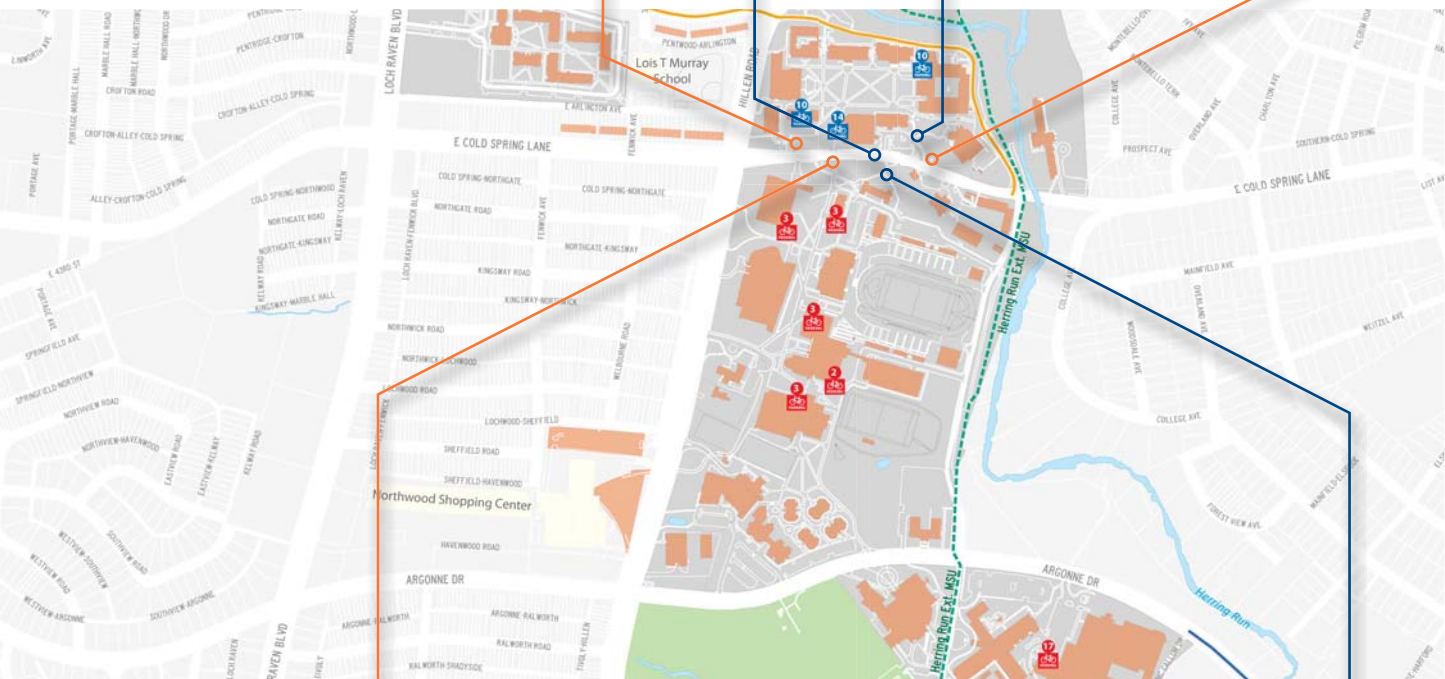
Outdated wayfinding without bike routes prevents bicyclists from efficiently navigating campus.



Switchbacks are difficult for bicyclists to navigate.

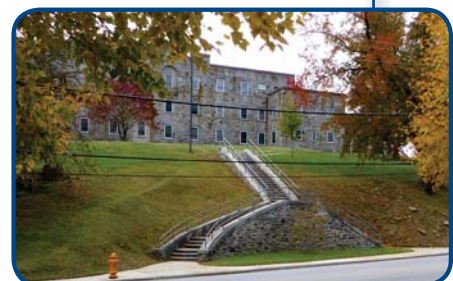
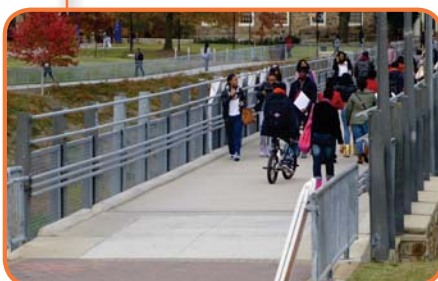


Wide stairs provide ample room for the addition of runnels (channels for bike tires).



Narrow pedestrian bridges create conflicts between bicycles and pedestrians.

When stairs may be the shortest path for bicyclists, runnels provide efficient, but not ideal, routes.





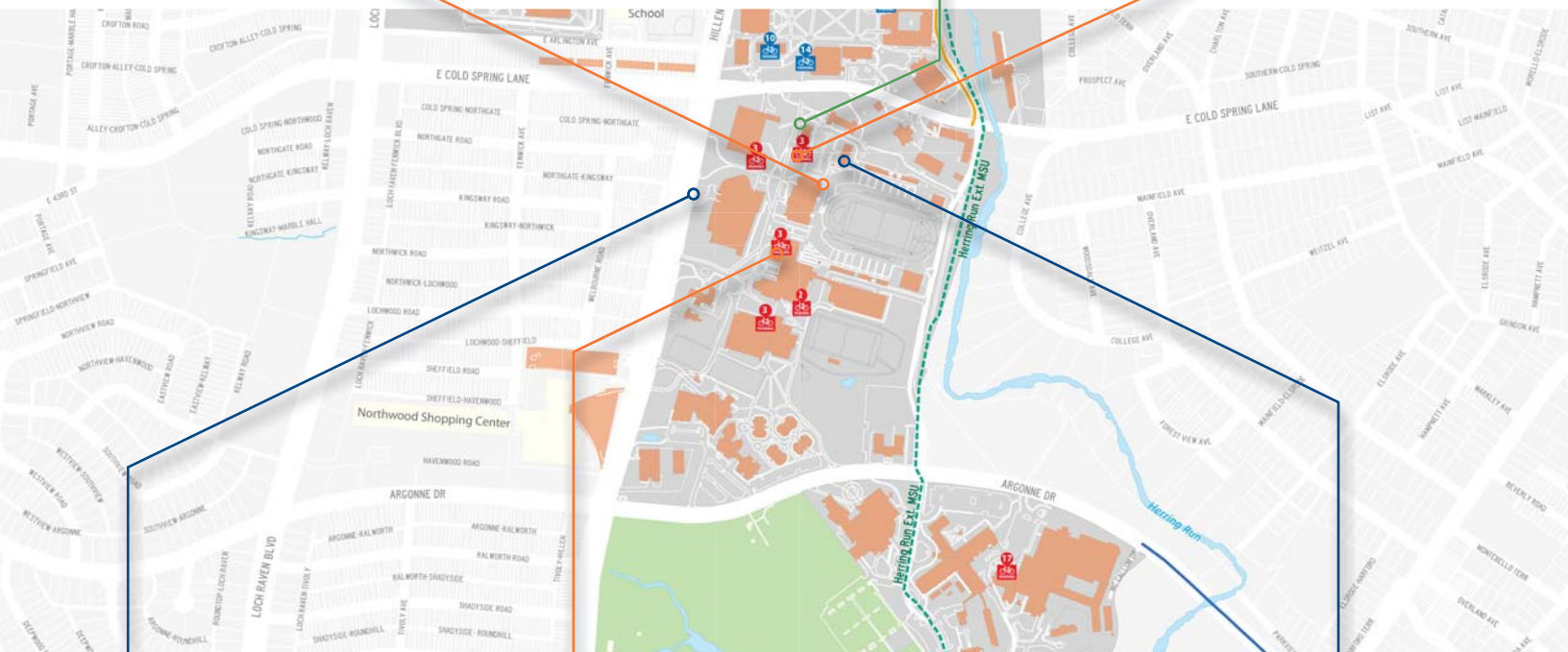
Areas that draw large crowds should have bicycle parking to alleviate vehicular congestion.



Damaged bicycle parking drives bicyclists to lock their bikes to other objects such as light poles and railings.



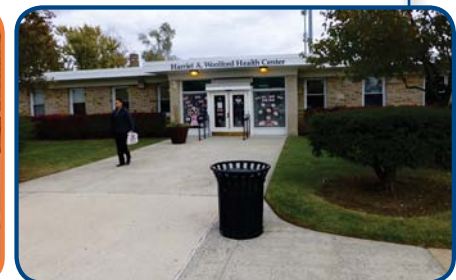
Wide paths through central campus currently support multiple modes of travel. If bicycle mode share increases, this may need to become a pedestrian priority zone.



Transit stops should be easily accessible via bike and should provide sufficient room for boarding and alighting.

The Student Center, one of the most densely populated buildings on campus, should have ample and compliant bike parking.

The Health Center lawn space could accommodate a variety of types of bicycle parking.





Main entrances to all buildings should have secure bicycle parking.



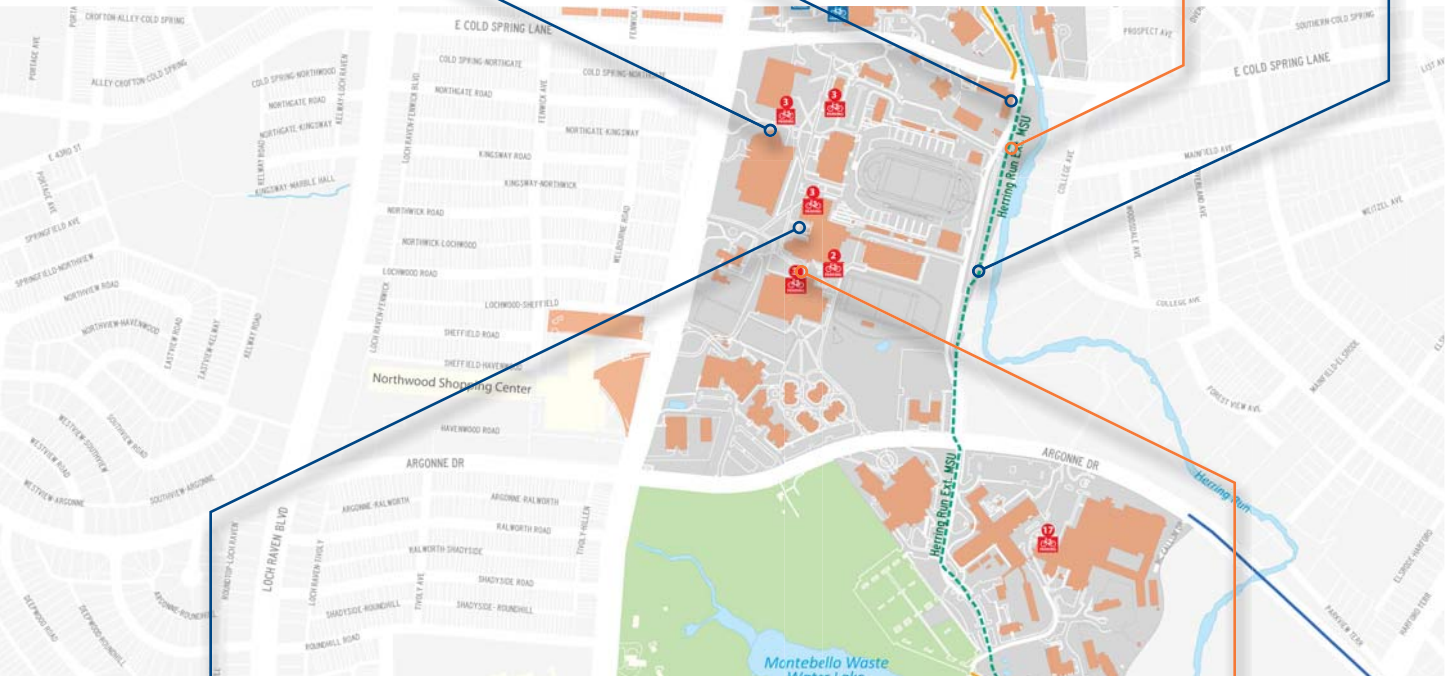
Widening the path will provide room for multiple user types and allow for passing.



Markings should indicate a bicycle route along Stadium Way to connect to the path.



Currently there is no transition from on- to off-road for bicycles to connect with the path.



Bicycle parking could easily be installed to accommodate the volume of students and faculty using the Student Center.

Parking within this courtyard needs to be updated as the type of parking is not secure and many units are in disrepair.





Adding bike racks to the Bear Transit Shuttle will improve trip flexibility.



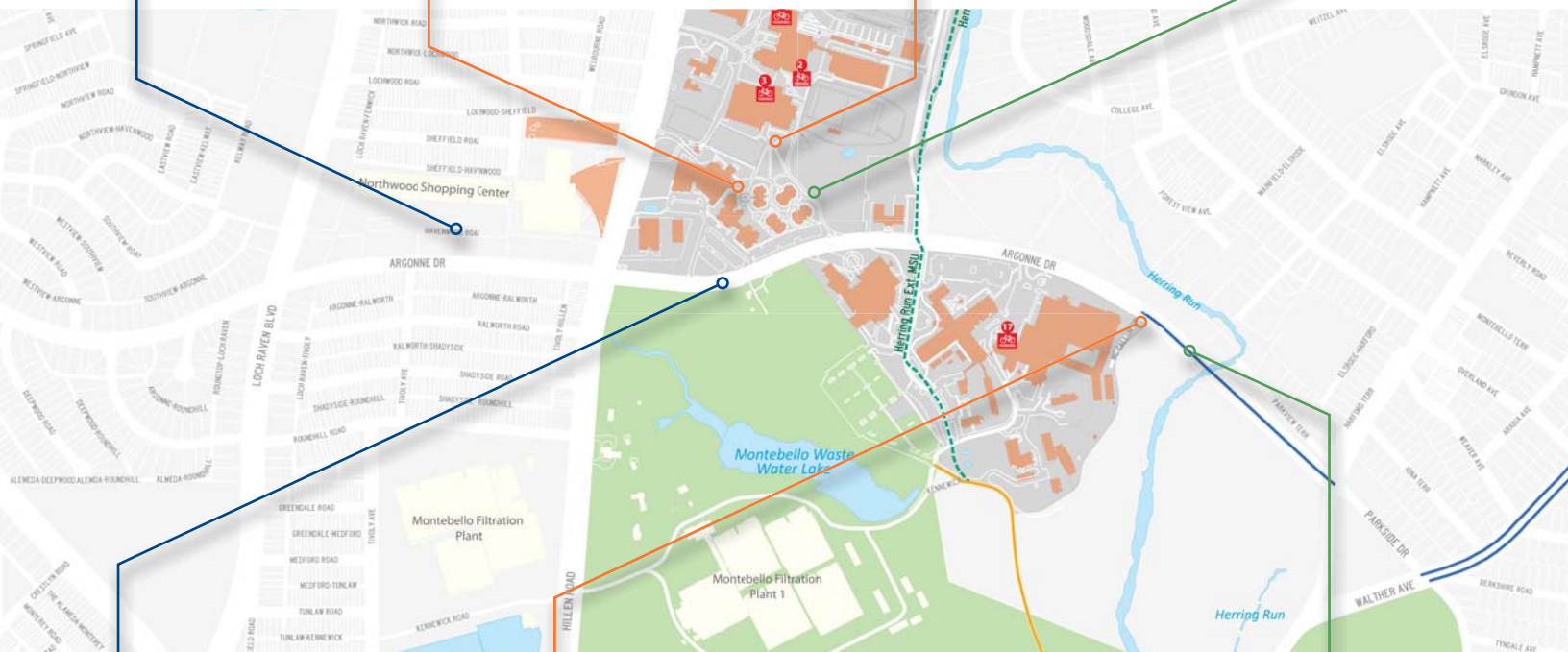
Wide paths provide space for two way traffic and multiple user types.



There is no bicycle parking in this residential area of campus.



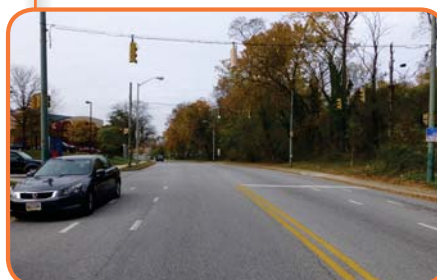
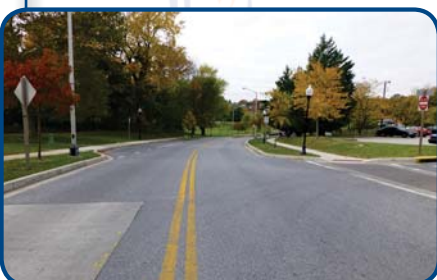
Navigating campus is difficult when signs are in disrepair and are not legible.



Argonne Drive may be an opportunity to add bike lanes or expand the multi use path.

The discontinuation of the bike lane creates a gap in the network and doesn't provide a complete connection to the campus.

Bike facilities on Argonne Drive create separation for bicyclists increasing safety and comfort.





If the road through Northwood shopping center connects with Fenwick Avenue, this could be a low volume north south connection.



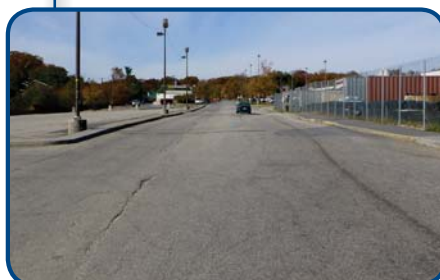
This "toaster" rack is not secure and does not provide appropriate locking points.

Unmarked crossings create unsafe environments for vehicles, pedestrians, and bicyclists.



The width of Havenwood Road provides an opportunity to implement on-road bike facilities.

The greenway connection between MSU and Montebello completes a north/south transportation connection and access to a recreation facility.



SUMMARY OF EXISTING NETWORK

The existing MSU bikeway network is largely composed of multi-use paths with some missing connections. The context is not connected, with short segments of bike lanes on Argonne and a signed bike route on Pentwood. In the future, greenways may provide north/south connections, but on-road facilities will create better circulation for the campus and surrounding neighborhoods.

The following table summarizes the engineering elements existing on the MSU campus.

CATEGORY/QUESTION	STATUS
Policies	Not At This Time
Network Map	Not At This Time
Facility Types/Design Guidelines	No design guidelines
End of Trip Facilities (Parking/Showers)	LEED standards for all new buildings. Bicycle racks are being installed at all buildings campus-wide.
Can students park/store bikes in dorm room?	Not At This Time
Transit Integration (Bike Racks on Shuttles)	Shuttle runs every 15 minutes from Blount Towers to Marble Hall Gardens: no racks on shuttle buses. City buses (MTA) all have bike racks on buses.

Education: Rules, Rights, and Responsibilities

Educations is an integral component of creating a bicycle friendly environment. Cultural attitudes of motorists and bicyclists can be modified by providing avenues for learning the rules and responsibilities of how to behave in a multi-modal environment. Teaching students how to perform routine maintenance, change flat tires, properly secure their bike, and laws for operating on roadways can improve personal safety and provide comfort to those who may be interested in bicycling but do not feel prepared and knowledgeable enough to use biking as a means of transportation.

The chart below indicates the types of educational programs the League of American Bicyclists evaluates. Currently, MSU does not provide any educational opportunities for students. Local advocacy groups may be an initial source for encouraging students and faculty to become more knowledgeable about the responsibilities of biking.

CATEGORY/QUESTION	STATUS
Bicyclist Education	Not At This Time
Motorist Education	Not At This Time
Ticket Diversion	Not At This Time
Safety/Skills/Commuter/Repair Workshops	Not At This Time
Cycling offered in PE	Not At This Time
Planning Department or Engineering Department Transportation Planning Classes	Not At This Time
Leagues Cycling Instructors or Classes	Not At This Time

Encouragement: Welcoming and Celebrating Bicycling

Encouragement programs are an excellent way to change culture, educate motorists and bicyclists, and help interested bicyclists feel comfortable about trying a new mode of travel by participating in large group events or riding with a “buddy.” Currently the only encouragement program MSU participates in is Bike to Work Day. Suggested encouragement programs within the BFU application are found in the table below.

CATEGORY/QUESTION	STATUS
Events	Not At This Time
Rides	Not At This Time
Buddy Programs	Not At This Time
Bike to Campus Day/Competitions	Host to 2010 Bike to Work Day
How is biking promoted?	Not At This Time
Cycling Teams/Clubs/Coops	Not At This Time
Bike share or rental program? On or off campus?	Not At This Time
Repair Areas or Services	Nearby bike shops: 10 within a 5 mile radius

Enforcement: Ensuring Safety for All

Enforcement consists of a combination of education and regulation. Those responsible for enforcing the behavior of bicyclists, and the behavior of motorists interacting with bicyclists must be educated on the appropriate local laws and campus rules. Enforcement is also a method for monitoring who on campus has a bike and helping retrieve stolen bicycles by collecting serial number information.

Morgan State is advanced in their on campus bicycle force. The mounted patrol helps monitor areas within campus that would be inaccessible via patrol cars. The presence of officers on bicycles also provides the community with a trained force of aids who can monitor remote areas and help with minor repairs. The below chart illustrates MSU’s current enforcement efforts.

CATEGORY/QUESTION	STATUS
Bike Registration	Staff indicated there is no registration policy – but new student packets indicate there is.
Bike Locks Provided or Lockers	Not At This Time
Security Patrols of Bike Parking	Not At This Time
Stolen or Impounded Recovery System	Not At This Time
Police training for bicycle behavior? Motorist behavior around bicyclists?	Not At This Time
Helmet/Light Enforcement	Not At This Time
Employees/Police on Bikes	25% of security is on bikes. Program established in 1999.

Evaluation: Planning for Success and Benchmarking Accomplishments

Creating metrics for evaluating the progress of this plan will be imperative to supporting the success of both campus and Citywide planning and implementation efforts. Evaluation is also key to ensuring plans remain active and integrated into yearly and monthly University budgets and action plans.

Currently MSU does not implement any official monitoring of the bicycling environment. This plan will be the first step in establishing benchmarks and providing a tracking mechanism for incremental changes and success.

CATEGORY/QUESTION	STATUS
Last Publication of Bicycle Plan	Currently under preparation
Dedicated Funding Source for Implementation	Not At This Time
Tracking	Periodic manual counts
Crash Data/Incident Data	Not At This Time
Satisfaction survey for bicyclists, yearly?	Not At This Time

Interpreting the Audit

The existing conditions and audit will be the initial benchmark for evaluating implementation and actions for the future state of bicycling on MSU campus. As the University strengthens its commitment to becoming more bicycle friendly, opportunities will be revealed for tapping into sources within campus and the City to create awareness, fund projects, and realize a vision for a more bicycle friendly environment.



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A strong and diverse majority of Americans say more bike lanes and trails would encourage them to ride more, including 60% of people of color and 59% of those earning less than \$30,000 per year.*

** The non-white category, as reported by PSRAI, is defined as Hispanics, African Americans, Asians, Native Americans, mixed or other race.*

Princeton Survey Research Associates, September 27-30, 2012, Omnibus survey



Chapter Three

NEEDS ASSESSMENT

Overview

Determining need expands beyond data collection, field documentation, and professional analysis. Gauging need requires speaking with people who bike, and may be interested in biking in and around Morgan State University. Those who do not bike often reveal immediate needs that will lead to changes in mode share.

The public involvement component of the planning process included two rounds of public input. The first round of public input was used as a discovery method. Observations during the first round revealed that bicycles represent a very small percentage of transportation choices to and around campus. These observations, coupled with an information booth and survey, completed the discovery phase. The second round of public input was used to review potential recommendations and garner support and feedback from students, faculty, and area residents.

Survey Results

The survey was provided in both hard copy (see page 3-4) and online to gather input

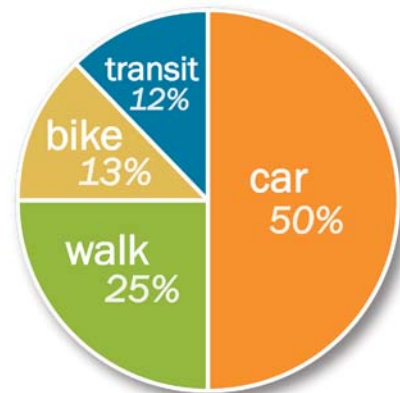
during the first booth presentation on campus and from those who were interested but did not visit the booth.

COMPOSITION

Of the 309 participants, 48% were undergraduate students, 18% indicated they were graduate students, and the remaining 34% were faculty, staff, and employees of the University.

MODE SHARE INDICATOR

While mode share is not currently measured, an indication of potential mode share can be deduced by selection of mode choice for the current day as recorded by each participant.



ACCESS, INTEREST, AND USE

While 45% of respondents have access to a bicycle, only 24% had ever tried biking to campus. However willingness and interest is not lacking. Over half (67%) of the participants said they were interested in biking to or around campus.

BARRIERS REVEALED

Several choices were presented to participants to understand why they do not bike to or around campus. Responses included:

COUNT	RESPONSE
122	I do not own a bike
90	I do not feel safe riding on the road
89	My trip is too far
86	Weather
70	Thefts
69	Too hard to carry stuff
68	I can't take a shower when I get to campus
58	Never thought of it as an option
30	Bikes are too expensive
28	Not interested in biking
27	Dropping off/picking up kids
25	I don't know routes
16	I don't have the right clothes
12	My bike is broken
10	I don't know how to ride
10	I take the bus and do not feel comfortable putting my bike on the rack

Some of these barriers can easily be overcome by campus efforts to educate and inform students and faculty and provide secure parking options.

INFLUENCE

Several factors were presented to explore which had the most influence over the community's decision to bike. The top influences were safety and secure bike parking.

WHAT CAN MSU DO?

Respondents checked boxes for what they thought were appropriate contributions by MSU to create a more bike friendly environment. The chart on page 3-5 shows each category and how many times it was selected. Many of the categories are also easily addressed with small, cost effective, improvements.



HARD COPY SURVEYS WERE DISTRIBUTED ON CAMPUS DURING THE INFORMATION BOOTH SESSION IN FALL 2013

MORGAN STATE BICYCLE MASTER PLAN SURVEY

Please help us plan for a better Bicycle Master Plan by completing the survey below. ☐ Undergrad ☐ Graduate
Input is needed by those who bike and do not bike to campus. Major: _____

1. How do you get to campus? (Check all that apply) ☐ Walk ☐ Bike ☐ Car ☐ Transit
2. How long (in minutes) is your commute? _____ (in miles - if you know) _____
3. Do you own or have access to a bicycle for your personal use? ☐ YES ☐ NO
4. Are you interested in biking to and/or around campus? ☐ YES ☐ NO
5. Have you ever used a bicycle for any of your trips travelling to/from campus? ☐ YES ☐ NO

6. What prevents you from considering biking to and/or around campus? (Check all that apply)

- | | |
|---|---|
| <input type="checkbox"/> I do not own a bike | <input type="checkbox"/> I don't know how to ride |
| <input type="checkbox"/> Never thought of it as an option | <input type="checkbox"/> I don't have the right clothes |
| <input type="checkbox"/> My bike is broken | <input type="checkbox"/> I can't take a shower when I get to campus |
| <input type="checkbox"/> Bikes are too expensive | <input type="checkbox"/> Too hard to carry stuff |
| <input type="checkbox"/> I do not feel safe riding on the road | <input type="checkbox"/> Dropping off/picking up kids |
| <input type="checkbox"/> I do not feel safe riding on trails | <input type="checkbox"/> Thefts |
| <input type="checkbox"/> I do not feel safe riding around campus | <input type="checkbox"/> Weather |
| <input type="checkbox"/> I don't know routes | <input type="checkbox"/> I am not interested in biking |
| <input type="checkbox"/> My trip is too far | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> I take the bus and do not feel comfortable putting my bike on the rack | |

Please skip to question #8

6. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? (Circle your rating)

	not important				very important
Length of the trip	1	2	3	4	5
Safety	1	2	3	4	5
Wanting to get exercise	1	2	3	4	5
On-street bike lane part of the way to your destination	1	2	3	4	5
Off-street bike path or trail part of the way to your destination	1	2	3	4	5
A place to shower/change/clean-up at your destination	1	2	3	4	5
Secure bike parking at your destination	1	2	3	4	5
Bike racks on buses	1	2	3	4	5
Protecting the environment	1	2	3	4	5
The weather	1	2	3	4	5
Having enough time to bicycle to destination	1	2	3	4	5
Higher gasoline prices	1	2	3	4	5
An increase in transit fares	1	2	3	4	5

7. What reaction do you get from others when you bicycle for transportation? (Check all that apply)

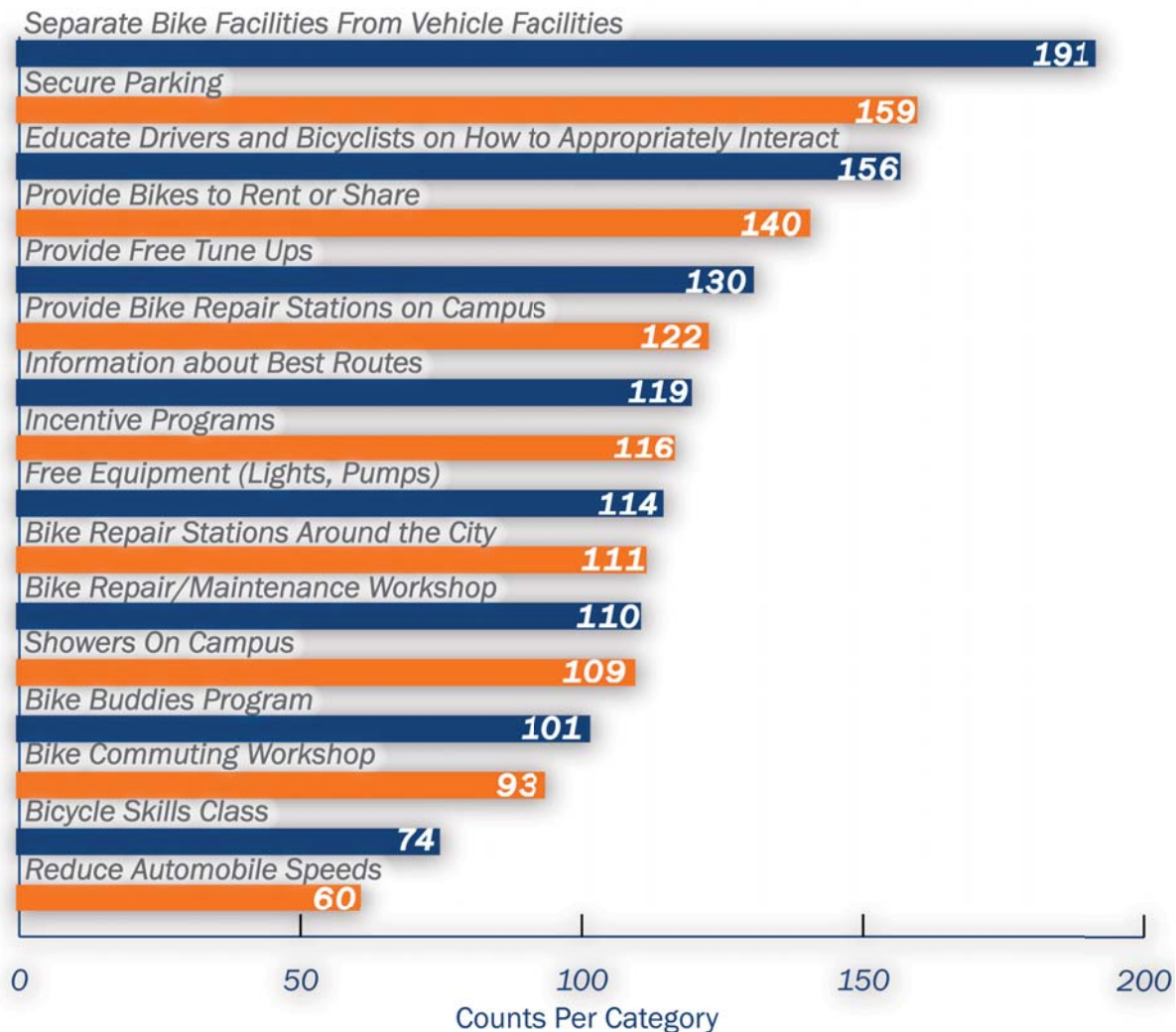
- | | |
|--|---|
| <input type="checkbox"/> No one blinks an eye | <input type="checkbox"/> Some motorists don't seem to see me at all |
| <input type="checkbox"/> Sometimes I get strange looks | <input type="checkbox"/> Motorists see me and act courteously toward me |
| <input type="checkbox"/> I get mostly positive comments/questions | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Some people tell me to get on the sidewalk/get off the road | |
| <input type="checkbox"/> I experience occasional harassment | |

8. What can Morgan State and the City do to make you feel safer and more comfortable when you ride your bike, or encourage you to choose a bicycle for transportation to or around campus? (Check all that apply)

- | | |
|---|--|
| <input type="checkbox"/> Separate bike facilities from vehicle facilities: trails, bike lanes, cycle tracks, side paths | <input type="checkbox"/> Provide bikes to rent or share |
| <input type="checkbox"/> Educate drivers and bicyclists on how to appropriately interact | <input type="checkbox"/> Information about best riding routes |
| <input type="checkbox"/> Reduce automobile speeds | <input type="checkbox"/> Incentive program (rewards, bonuses) |
| <input type="checkbox"/> Bike commuting workshop | <input type="checkbox"/> Organize bike buddies program |
| <input type="checkbox"/> Bike repair and maintenance workshop | <input type="checkbox"/> Free equipment like lights, and pumps |
| <input type="checkbox"/> Provide free bike tune-ups | <input type="checkbox"/> Better facilities on campus: secure parking |
| <input type="checkbox"/> Provide bike repair stations around the city | <input type="checkbox"/> Better facilities on campus: showers |
| <input type="checkbox"/> Provide bike repair stations on campus | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Bicycling skills class | <input type="checkbox"/> Other: _____ |



WHAT CAN MSU DO TO CREATE A MORE BIKE FRIENDLY ENVIRONMENT



Information Booth Input

During the discovery phase, a booth was set up in the student center to collect information about attitudes toward biking on campus and thoughts from students and faculty on facility improvements. Overwhelmingly, the campus population expressed there is no secure place to lock their bikes - while living on campus or when traveling to campus (for off-campus students and faculty). The disconnected network and lack of facilities connecting to the campus was also a concern for those who already bike, and those who are interested but do not feel safe.

We need your input!

Join us
Wednesday, October 9th
11am - 2pm
Outside the University Student Center

DO you bike to campus?

WOULD you bike to campus?

WHERE is bike parking needed?

WHAT routes do you use?

WHERE do you feel safe biking?

WHAT improvements are needed?

ARE THERE conflict points on campus?

WOULD you borrow or rent a bike?

A flyer was distributed throughout campus and via local advocacy groups to drive participants to the booth.

PUBLIC INPUT MATERIALS INCLUDED CAMPUS MAPS FOR DRAWING FACILITY IMPROVEMENT SUGGESTIONS, FACILITY PREFERENCE BOARDS SERVING AS A VISUAL PREFERENCE SURVEY, AND LOCAL SAFETY INFORMATION, AND BALTIMORE BIKE MAPS

Bicycle Facility Types

Which facilities are needed on and around campus? Vote by placing dots on the pictures below.

CYCLE TRACKS



BIKE LANES/BUFFERED BIKE LANES



BIKE BOULEVARDS/ SHARROWS



PAVED SHOULDERS/WIDE OUTSIDE LANES



GREENWAYS/SHARED USE PATH/BOARDWALKS



INTERSECTIONS/SIGNALS/PARKING



Interpreting Feedback

While it is not possible to immediately respond to all needs expressed by the campus population, small improvements can make large impacts on the current bicycle mode share. Clear trends were revealed in the survey and during Information Booth sessions. Safety was a major concern for those who bike to campus, and those who do not but are interested. Bicyclists shared their qualms with riding on streets without bike facilities. Those who do not bike revealed they are concerned with the lack of secure parking on campus and riding to campus on roads without bicycle facilities. Residents on campus noted the lack of secure parking and inability to store their bicycle in their dorm room or building. Informally, students and faculty shared that they would bike along different, more direct

routes, if they felt safe, but choose less direct routes to minimize interactions with vehicles.

Changes made in the built environment, new policies, and sufficient end of trip facilities will contribute to an increased bicycle population on campus. In New Orleans, the installation of a bike lane on South Carrollton Street dramatically increased the number of diverse riders, including a 135% growth in youth, 115% rise in female and 51% increase in African American bicyclists¹. However, these changes must be accompanied by the appropriate outreach strategies to inform and educate students and faculty of the availability and policies or rules guiding each. This combination of outreach and facility improvement will create a more bike friendly Morgan State University.



Students, Faculty, and Area Professionals Participated in the Information Booth Activities

¹ Parker et al. Effect of Bike Lane Infrastructure Improvements on Ridership in One New Orleans Neighborhood, *Annals of Behavioral Medicine* (2012)

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According to the PSRAI poll, people of color (39%) were more likely to indicate that “learning about safe riding skills” would increase their riding — far higher than white (20%) respondents.*

*Princeton Survey Research Associates, September 27-30, 2012,
Omnibus survey*

In Minneapolis, for instance, 84% of participants in Cycles for Change “Learn to Ride” classes identify as immigrants — and 87% as people of color.

Cycles for Change



Chapter Four

PEER REVIEWS

Overview

In recent years, there has been significant interest and advancement in developing bicycle-friendly campuses around the nation. Studying how other universities have been implementing bicycle infrastructure and programs that foster greater bicycle usage can be a useful tool in aiding in the development of the Morgan State University Bicycle Plan. This can help identify actions which are most relevant and appropriate for local conditions and maximize the benefits derived from these types of investments.

Seven peer institutions were selected by the team for study and comparison which share various similarities with Morgan State University. These included:

- Emory University: Atlanta, Georgia
- Howard University: District of Columbia
- Salisbury State University: Salisbury Maryland
- Towson University: Towson, Maryland
- University of Baltimore: Baltimore, Maryland
- University of Maryland at Baltimore County: Catonsville, Maryland
- University of Maryland at College Park: College Park, Maryland

NOTE:

While Morgan State University is a unique institution and none of the selected peer institutions mirror all or even most of MSU's characteristics, each had some aspects in common with MSU to draw reasonable comparisons and from which applicable lessons could be learned. These commonalities included the size of the university, type of university (public or private), demographics/ethnic composition, the size of the student population and faculty, regional context, geographic location and climate, and Bicycle Friendly University (BFU) status.

Profiles and Rationale

The following profiles summarize each institution and provide a rationale for why they were included. A chart, organized by the 5 E's follows the reviews and serves as a comparison for each institution indicating how MSU may learn and implement similar strategies to improve bicycling conditions in and around campus.

EMORY UNIVERSITY



The Bike Emory program encourages students, faculty, and staff to ditch the car and bike to campus.

Emory University is a private, four-year university located in Atlanta, Georgia. It is a medium-sized university with a residential campus. The student population consists of 7,656 undergraduate students and 6,580 graduate students. There are 13,023 faculty and staff members.

In 2007, Bike Emory, a partnership between Emory University, Fuji Bikes, and Bicycle South, was created. In 2011, the League of American Bicyclists awarded Emory University with a bronze level, Bicycle Friendly University status. The school continues to maintain its bronze level designation.

Contact: Jamie Smith is the acting Director of the Bike Emory Program, a partnership which provides advocacy support and incentives to encourage bicycle use.

RATIONALE

Emory University is located in a similar urban/suburban context to MSU in that it is located within the corporate limits of a large city (Atlanta) but situated several miles northeast of downtown within a medium density residential environment. Emory is approximately twice the size of MSU, but still closer in size than many larger public universities. Additionally, Emory University has achieved Bicycle Friendly University status (Bronze) which would be the first certification level for MSU.

HOWARD UNIVERSITY



Howard University students walking near Founders Library.

Howard University is a private, four-year university located in Washington, D.C. It is a medium-sized university with a residential campus. The student population consists of 6,974 undergraduate students and 3,323 graduate students. There are 1,295 faculty and 1,775 staff members.

The Howard University Campus Master Plan provides design guidelines to improve campus bicycle conditions. Howard University students, faculty, and staff have access to Capitol Bikeshare stations, bike lanes, and bike routes in the area. The Campus Master Plan identifies the gaps that exist between these local facilities and Howard University. Furthermore, the plan defines strategies to create a more interconnected infrastructure network between campus and the surrounding areas.

RATIONALE

Howard University, like Morgan State University, is a Historically Black College, located in a highly urbanized section of the District of Columbia. Howard and MSU have student populations that are comparable in size.

SALISBURY UNIVERSITY



Bicyclists participate in Salisbury University's annual Sea Gull Century Ride.

Salisbury University is a public, four-year university located in Salisbury, MD. It is a medium-sized university with a commuter campus. The student population consists of 8,004 undergraduate students and 639 graduate students. There are 571 faculty members, 388 of which are full-time and 184 of which are part-time.

Bicycling is a component of the University's "Sustainability @ SU" program. The program, aiming to achieve campus-wide sustainability in a variety of sectors, offers information on bicycle resources, including bike racks and locations, local, bike-friendly merchants, and bicycle repair stations.

Contact: Wayne Shelton is the Director of Sustainability and Environmental Safety.

RATIONALE

Salisbury University is a four year Maryland state school and liberal arts college, as is MSU. Salisbury University, located in the town of Salisbury on Maryland's Eastern Shore is comparable in size to MSU. Both schools have high percentages of students who commute from off campus.

TOWSON UNIVERSITY



Towson University students congregate outside of the College of Liberal Arts, a LEED Gold certified building.

Towson University is a public, four-year university located in Towson, MD. It is a large-sized university with a predominantly commuter campus. The student population consists of 17,988 undergraduate students and 3,972 graduate students. There are 1,643 faculty members, 848 of which are full-time. There are also 1,828 staff members, 1,357 of which are full-time.

Campus Recreation Services conducts Towson University's own bike share program on campus. The first 32 applicants to the program receive bikes for the remainder of the semester, free of charge.

Contact: Jack Nye is the Director of Sustainability and Pam Mooney is Director of Parking and Transportation Services.

RATIONALE

Towson University is a public institution located only a few miles away from Morgan State University. While Towson has grown significantly in recent years and is now considerably larger than MSU, both schools are situated in similar urban/suburban surroundings and both have high commuter populations.

UNIVERSITY OF BALTIMORE



The monthly "Bike Party" rides through downtown Baltimore City.

The University of Baltimore is a public, four-year university located in Baltimore, MD. It is a medium-sized university with a predominantly commuter campus. The student population consists of 3,426 undergraduate students and 3,132 graduate students. There are 345 faculty and 786 staff members.

Bicycling is promoted through the Office of Facilities Management and Capital Planning, as a "green" method of transportation to and throughout campus. In 2011, the University of Baltimore applied to become a Bicycle Friendly University, yet was denied BFU status.

Contact: Jeff La Noue is the Project and Sustainability Planner for the University of Baltimore.

RATIONALE

The University of Baltimore (UB) is the only peer institution located in Baltimore City. UB is located close to downtown Baltimore in a more urban setting than MSU, but is also primarily a commuter campus of similar size student population. In addition, UB also has a minority majority student population.

UNIVERSITY OF MARYLAND, BALTIMORE COUNTY



Bike rides are organized by the University of Maryland, Baltimore County Cycling Club.

University of Maryland, Baltimore County (UMBC) is a public, four-year university located in Baltimore, MD. It is a medium-sized university with a predominantly residential campus. The student population consists of 11,136 undergraduate students and 2,772 graduate students. There are 1,017 faculty members, 738 of which are full-time. There are also 1,188 staff members, 1,110 of which are full-time.

Bicycling is promoted at UMBC through the "Sustainability Matters" campaign as a "green" method of transportation to and throughout campus. "Sustainability Matters" provides information about bicycle resources on UMBC's campus, including the university's first bike share program, which allows students can rent bikes daily, free of charge.

Contact: Tanvi Gadhia is the Environmental Sustainability Coordinator.

RATIONALE

The University of Maryland, Baltimore County (UMBC) is located in a suburban part of the Baltimore Region but still in proximity to Baltimore City. UMBC is a four year, public university, as is Morgan State University. Both schools are medium in size, with comparably sized student populations.

UNIVERSITY OF MARYLAND, COLLEGE PARK



University of Maryland, College Park students walk and bike across campus.

University of Maryland, College Park (UMCP) is a public, four-year university located in College Park, MD. It is a large-sized university with a predominantly commuter campus. The student population consists of 26,487 undergraduate students and 10,710 graduate students. There are 4,248 faculty and 5,134 staff members.

The university bicycle program, Bike UMD, is a partnership between the Department of Facilities Management, Campus Recreation Services, and the Campus Police Department. In 2011, the League of American Bicyclists Awarded the UMCP with a bronze level, Bicycle Friendly University status. That changed in 2012, when the League of American Bicyclists awarded UMCP with a silver level, Bicycle Friendly University status. UMCP continues to maintain its silver level designation to this day; however the university has a goal of achieving a gold status.

Contact: Mike Levensgood is the acting Bike Coordinator for the University of Maryland, College Park.

RATIONALE

University of Maryland, College Park (UMCP) is also located in Central Maryland and is considered the University of Maryland "flagship" institution. While it is much larger than MSU, it also has a large percentage of students who commute and is set in an older suburban setting outside of Washington, DC, in a medium density residential area similar to MSU. Additionally, UMCP has attained Bicycle Friendly University status (Silver).

Peer Review Research Results

The team conducted research to discover the full breadth of activities each peer institution has undertaken in recent years to plan and implement various bicycle related improvements. This included plans and recommended actions as well as programs, policies, activities, and physical improvements that have been implemented.

The following tables are arranged by the 5 E's and closely follow the categories rated within the BFU application. Each institution was analyzed to understand which programs, facilities, and other action steps have been taken to contribute to each of the E's. This comparison reveals potential implementation strategies for MSU to increased bicycle friendly status in and around the campus. Throughout the table elements are highlighted to indicate potential strategies for MSU in the short, mid, and long term.

PEER INSTITUTION COMPARISON MATRIX

POTENTIAL IMPLEMENTATION STRATEGY FOR MSU

short term

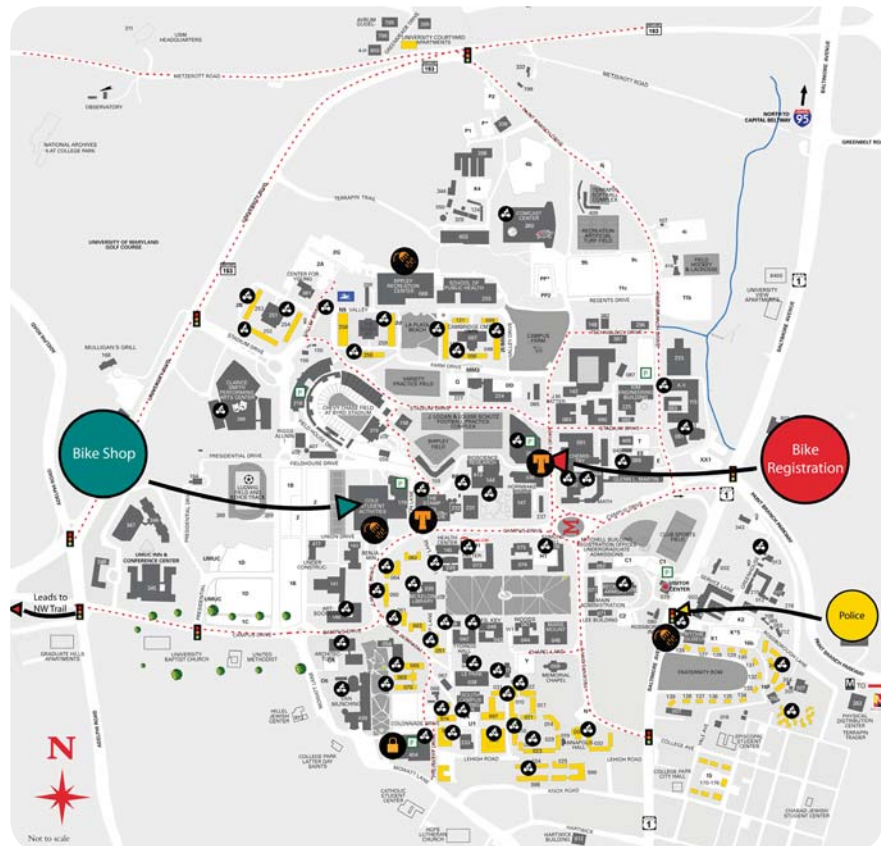
mid term

long term

The short, mid, and long term shaded cells represent measures that other schools have implemented and could be applied or adapted to MSU to improve bicycling conditions in and around campus.

ENGINEERING							
	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Policies	Waiver to rent bike.	Renovations: bike racks required. New buildings: Indoor bike space.	None.	None	None	None	Goal: create "rules of the road", establish transportation hierarchy. Bicycle Advisory Group.
Network (Map)	Emory Area Bike Map. Bike Suitability Map.	Maps on websites, orientation packages, and on kiosks. Bike Parking Map created with new facilities.	Bike rack map. Town has Bike Route Map.	Circulation diagram and a map.	None	None	Yes-Campus Bicycle Routes Map. Also bike parking map.

A campus bike map, like the one shown here from the University of Maryland, aids in navigation and perceived safety. This example clearly indicates where secure parking is located, identifies where bicyclists can shower, highlights the location of campus police, and directs bicyclists to the on-campus bike shop.



short term

mid term

long term

ENGINEERING

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Existing Facility Types/Design Guidelines/Network and Facility Recommendations	Bike racks, lockers, and shower facilities. Racks, showers, and lockers are to be added in new construction when appropriate.	Off campus: on-street bike lanes, signed bike routes, and 3 bikeshare stations. Dorms have racks. Guidelines exist for developing bicycle infrastructure and facilities. Planned change: campus bike paths or on-road facilities. Recommends building a cycle track and in-road bike facilities. Long-term, indoor bike storage implemented when storage locations are identified. Planned change: sheltered bike parking.	Parking facilities-bike racks.	Campus Master Plan provides relevant design guidelines.	Parking facilities-bike racks.	Strategies being considered include installation of bike lanes, bike parking facilities, and a bike rental program.	Goals: Dismount zones in heavy ped areas. Recommended actions: reduce conflict with peds, bikes, cars. Widen multi use paths. Support bike facility development in Purple Line. Create trail system connecting to north district. Bicycle Study: streets for all modes, covered parking at residences, bike parking guidelines, recommends bike/ped facility inventory. Bike summary report recommends: climbing lanes, cycle tracks, multi use paths, shared streets, engage SHA and WMATA.

short term

mid term

long term

ENGINEERING							
	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
End-of-Trip Facilities (Parking/Showers)	Shower and locker facilities are available.	Bike racks. Master Plan recommends commuter showers and parking. Recreation Center to have showers, lockers, and sheltered parking. Goal: expand parking: 207 spaces in 3 years, 389 in 3-5.	Bike racks available.	Bike racks available. Goal: Improve amenities.	Bike racks available.	Bike racks available.	Covered and uncovered U-racks. Bike commuter shower pass: locker room access. Recommended: in street bike parking, on demand bike lockers, bike cage, modular bike parking unit, bike station. Campus Bicycle Study recommends campus population design bike stations and covered parking.
Transit Integration	None	None	None	Buses either have or will have racks.	None	Some buses have bike racks.	Bike racks on buses & shuttles.



Innovative bicycle parking solutions, such as this coded entry secure building can instill confidence in students and faculty that their bike is secure and covered from inclement weather.

Photo shows custom secure parking by Duo-Guard.

short term

mid term

long term

EDUCATION

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Bicyclist Education	"Cyclopedia:" information for riders about cycling. True Beginners Classes: people who never learned to ride a bike. (classes offered by gender) Spring Cycling Class. Bicycle safety classes.	University will distribute information on nearby bicycle vendors and services.	None	None	None	None	BikeUMD and Outdoor Recreation Services offer classes in cycling, commuting, and maintenance. Website-tips on how to choose a bike. Education campaigns on parking and shared lanes. FMP Goal: Inform community about transportation network.
Safety/ Skills/ Commuter Repair Workshops	Atlanta Bicycle Campaign holds safety classes on campus. Bike South Tubes and Lubes safety class.	None	None	None	None	None	Learn to bike classes, Traffic 101, Custom bike clinics.

short term

mid term

long term

EDUCATION

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Leagues Cycling Instructors or Classes	Confident City Cycling classes, led by instructors certified at the Atlanta Bicycle Coalition.	None	None	None	None	None	Traffic Skills 101: Developed by the League of American Bicyclists and taught by a League Certified Instructor. Cyclists learn to ride safely and legally in traffic or on the trail. Students learn to conduct bike safety checks, fix a flat, on-bike skills, and crash avoidance.

ENCOURAGEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Events	ABC Commuter Breakfast held monthly.	None	None	Pilot program offered 25 free bikes.	Tour Du Port, Tour Dem Parks, 4k for cancer, Baltimore Bicycle Works: Roadside Repair Clinics, Cities 4 Cycling Symposium	None	Free bike clinics. DOTS leads bike friendly programs and outreach efforts. Bike safety info given to new students, employees, and at resource fairs. Bike raffles. Light and u-lock giveaways.

short term

mid term

long term

ENCOURAGEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Rides	Shaking the Blues Cruise, Melton's App and Tap, and Decatur Wonderful Evening Ride.	None	Bike Club offers training rides.	None	None	Dark/light fun ride	local rides, dc evening bike tours, group rides, Halloween ride and costume contest, rides to trails, rides to lakes
Buddy Programs	Atlanta Regional Commission's Bike Buddy Program (Emory was pilot)	None	None	None	None	None	Commuting partner information available.
Bike to Campus Day/ Competition	Bike to Work Day. Bike to Work Week. Ride to Campus Day.	None	None	None	Bike Month. Bike to Work Day.	None	Annual Bike Week and Share the Road events in April.

Bike Month is a great opportunity to partner with other local institutions, advocacy groups, and the city to encourage biking to and around MSU.



short term

mid term

long term

ENCOURAGEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
How is Biking Promoted	At Orientation: students can pre-order discounted bikes, are given free helmets, are able to purchase u-locks, and are eligible to receive 3 months maintenance. Parking passess and Zipcar accounts are available at discounts. Students with bikes on campus can have parts and accessories delivered at discounted prices. Bike class fees are waived for bicycle owners. Bike events calendars are posted around campus.	HUCMP recommends bike commuter benefit program for faculty/ staff. Planned change: incentives/ benefits for bike/walk commuters. HU will reach out to Blackstone Bicycle Works to help identify Bike Repair and Maintenance Education Program opportunities and barriers.	Sea Gull Century (local ride) gives scholarships to students.	Promoted through email, website, and the campus-wide daily electronic newsletter. The university observes the annual "ride your bike to work day" as another means of promotion.	Biking is promoted at student and new employee orientations. Also promoted at the spring and fall block parties. Biking events are promoted on campus and through Bike UB on Facebook.	None	Terp-Trade-In Program: Trade commuter permits for Fuji bike. Bike light giveaways. Goal: provide way finding signage to encourage bicyclists and improve ease of circulation throughout campus. Bike commuter access to discount bundle packs for parking on bad weather days and sign-up for guaranteed ride home.
Cycling Teams/ Clubs/ Coops	Emory Club Cycling & Triathlon	None	Yes-Bike Club.	None	None	Yes-Cycling club	Maryland Collegiate Cycling Team, the university's club cycling team

short term

mid term

long term

ENCOURAGEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Bike Share or Rental Program (On or Off Campus)	Bike rental program on main campus. Bike share program for students, faculty, and staff on Oxford Campus.	On and off campus bike share. Committed Action: HU will fund at least one bikeshare station on the campus. Will explore pilot program for faculty/ staff department adopting access to a bike. Will provide up to 5 bikes.	Would like a bike-sharing program. Potential ideas/ actions: Create tools to promote bike-sharing.	On campus rental program. Campus Master Plan suggests creating bike-share program with Goucher College.	No. Would like a station on campus.	None	Rental program on campus: 4 Capital Bikeshare stations. Rent & Ride bicycle lease program.
Repair Areas or Services	Mobile repair center (2x a week). Bike Repair Unit on campus called "The Hub"-partnership between Bike Emory and Bicycle South. 2 and 4-year maintenance packages offered.	Planned change: Bike Repair Facilities and provision of air compressors for bikes.	4 Dero Fixit Stations, with bike rack, manual air pump, and tools. QR code takes smart phone users to a website.	Bike shops: Princeton Sports, Sports Authority, Performance Bicycle, Joe's Bike Shop, Lutherville Bike Shop, REI and Baltimore Bicycle Works.	Regular repair clinics at Baltimore Bicycle Works are promoted on Bike UB Facebook page.	None	Campus Bike Shop. Five bike repair stations on campus.
Campus Bike Map	Yes	None	None	None	None	None	Yes

short term

mid term

long term

ENFORCEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Bike Registration	Must register to benefit from incentive programs. Can only register for one commuter program at a time. Bike/Walk Application Form.	None	Encouraged, not required. Registration is free. Register at Parking Services Offices, M-F, 8AM-5PM. Online registration available. Bike decals received after registration.	Students complete an online registration form for bike share program.	Registration process: fill out card, entered into database. Issued registration sticker for bike.	SGA Department of Environmental Affairs	Bicycles must be registered with DOTS to be parked on campus. Registration is free. Bike registration event.
Bike Locks Provided or Lockers	Lockers available. Students must buy locks. Summer bike storage costs \$45.	None	Students can purchase locks at Guerrieri Center. Campus Police can help students select locks.	Bike renters must buy locks and helmets.	None	Bike lockers have been installed.	Locker rentals in parking garage. Locks available for purchase at discounted price.
Security Patrols of Bike Parking	None	None	None	None	None	None	Sweeps done several times a year.



short term

mid term

long term

ENFORCEMENT

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Stolen or Impounded Recovery System	Abandoned bikes seized twice a year. Bikes are tagged. If tag not removed in a week, the bike is removed and stored for 30 days. If the bike is not claimed after 30 days, it is donated or re-purposed.	None	None.	Loss or damage charged to renters bursar account.	None	None	Yes- abandoned/ stolen bike database. Bikes left on shuttles, parked bikes in disrepair or abandoned, and locks, chains, wheels, and helmets left for 3 days are impounded. Bikes appear abandoned/ in state of disrepair will have notice attached for 2 weeks prior. Bikes unclaimed after 1 year and 1 day are disposed or sold. Abandoned bike auction.
Helmet/Light Enforcement	Helmets strongly encouraged.	None	None.	None	None	None	Helmet not required.

short term

mid term

long term

EVALUATION AND PLANNING

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Last Publication of Bicycle Plan	Plan in progress	None	None	None	None	None	2011: Bicycle Summary Report; 2009: Campus Bicycle Study
Dedicated Funding Source for Implementation	None	Potential local and federal grants.	None.	None	None	For bike path: MDOT & Inaugural Bikeways Program Grants	Capital Bikeshare stations funded through 80/20 state grant jointly won with City of College Park.
Tracking	None	Bikeshare utilization rates tracked on Capital Bikeshare website.	None.	None	None	None	Yes-bicycle use rates have been tracked and published in campus documents.
Crash Data/Incident Data	None	None	None.	None	None	None	Report accidents through DOTS online form.

short term

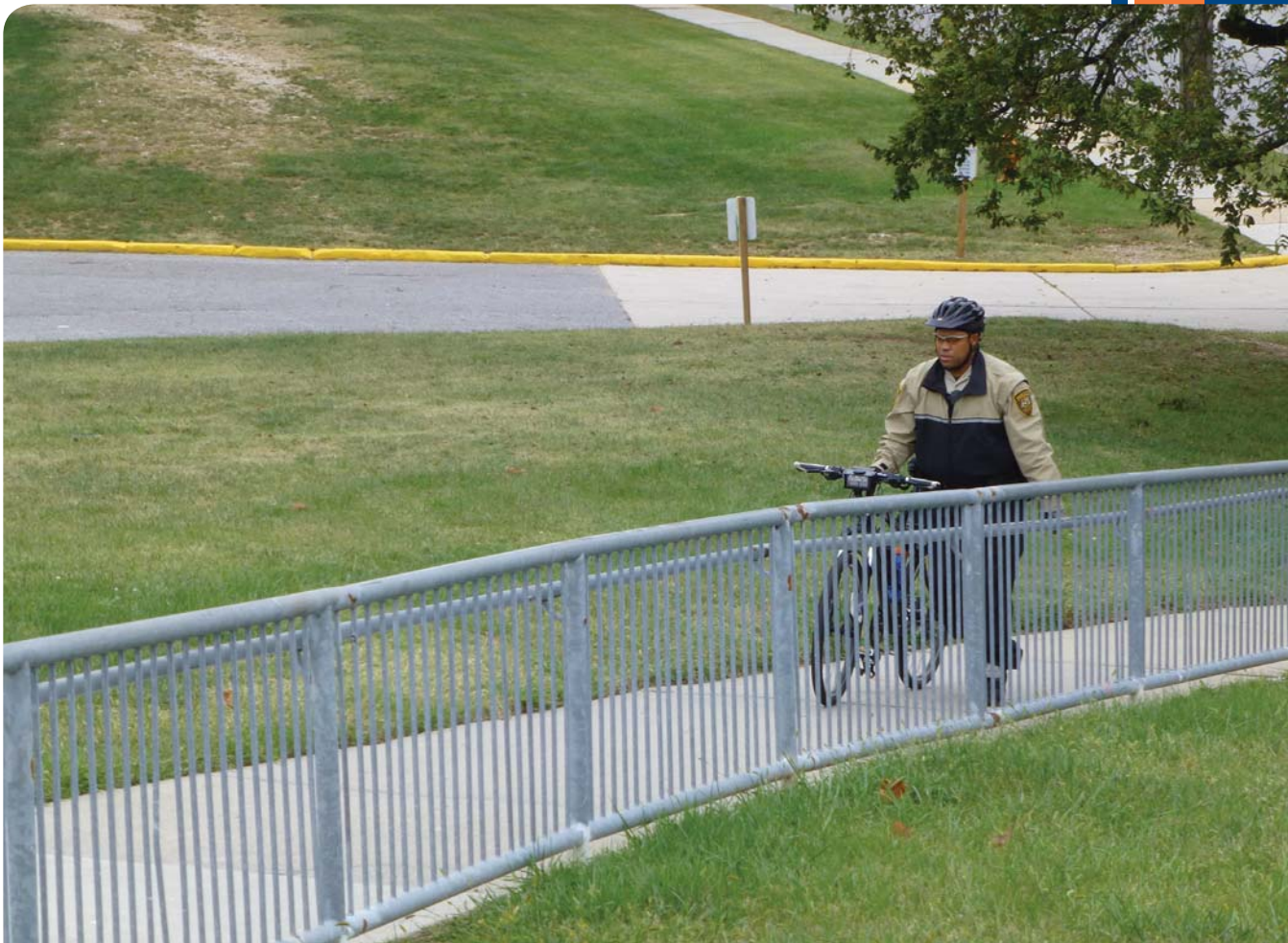
mid term

long term

EVALUATION AND PLANNING

	Emory University	Howard University	Salisbury University	Towson University	University of Baltimore	University of Maryland, Baltimore County	University of Maryland, College Park
Satisfaction Survey for Bicyclists	Survey sent to all students and faculty, regardless if they are bicyclists.	Annual TDM surveys should indicate a measurable increase in the bike-commute mode share among Central Campus commuters. Peak hour utilization surveys will be conducted to identify bicycle utilization and help quantify any supply constraints / surpluses.	None.	Student surveys identify areas of campus in need of new/ more bike racks.	None	None	Campus Transportation Survey conducted in 2010.

Morgan State University's bicycle patrol is a key connection between future enforcement and safety that will contribute to a more bicycle friendly environment.



People of color (47%) were far more likely than whites (32%) to indicate that “plentiful, secure bike parking” would increase their bicycling.*

** The non-white category, as reported by PSRAI, is defined as Hispanics, African Americans, Asians, Native Americans, mixed or other race.*

Princeton Survey Research Associates, September 27-30, 2012, Omnibus survey



Chapter Five

RECOMMENDATIONS AND IMPLEMENTATION STRATEGY

Recommendation and Implementation Methodologies

Recommendations and implementation strategies follow a logical process that involves data gathering, analysis, and cross checking. The following steps were followed to arrive upon the recommendations within this plan:

1. Research local laws, policies, and bicycle recommendations.
2. Observe and analyze behavior, circulation patterns, cultural effects, environmental challenges, and opportunities for improvement.
3. Gather input from bicyclists, advocacy groups, local planning professionals, and interested bicyclists.
4. Formulate recommendations that will improve bicycling conditions.
5. Vet recommendations for feasibility, and appropriateness, and assign manageable time frames to improvements.

Recommendations within this plan are categorized by four implementation time frames: short, mid, long, and future. Short

term strategies should be completed within 1-3 years of the adoption of this plan. Mid-term implementation strategies should be completed within 4-6 years, and long-term solutions should follow in the next 7-10. Since this is the first Bicycle Master Plan for MSU, a future category has been created to capture solutions that may be out of reach in ten years, but coincide with the needs analysis and vision of the plan.

Implementation timelines are based on a combination of factors. Safety and security were rated as top priorities in the survey and public input booth sessions. Therefore, improvements that contribute to these two factors are high priorities. Feasibility - cost, staff availability, cooperation with the City, the ability of the University to manage and monitor success - is also taken into account.

The recommendations and implementation time frames are segmented by the 5 E's. This will allow staff to monitor progress according to the League of American Bicyclists and gauge an appropriate time to apply for Bicycle Friendly University Status. This categorization will also provide a framework for understanding how well rounded the efforts completed are according to the League.

Engineering: Infrastructure and End of Trip Facilities

Engineering recommendations will improve circulation in and around campus, provide sufficient end of trip facilities, and provide policies that enable the successful implementation of these physical modifications.

POLICY

Policy recommendations are the foundation for many other improvements, including new facilities. These set standards and methods by which the campus follows for daily operations, design, implementation, and enforcement.

POLICY		Supporting Agencies	Implementation Time Frame
Recommendation	Description / Rationale		
Adopt this Bicycle Master Plan	Provides a road map for improvements and indicates MSU's commitment to support the implementation of bike facilities in and around campus.	City of Baltimore Department of Transportation (BDOT)	Short
Present this Plan to Baltimore DOT and MD State Highway Administration (SHA)	Establishes buy in from local agencies and creates awareness of needs and recommendations of MSU.	BDOT SHA	Short
Incorporate recommendations of this plan into other area plans	This will aid in funding and feasibility/design studies for the recommendations.	BDOT SHA Baltimore City	Ongoing
Adopt an Accommodation for All or Complete Streets Policy. See City of Baltimore Council Bill 09-0433.	This policy will set the standard for accommodating all modes within the right of way in and around campus. Any improvements should be focused on facilities for vehicles, pedestrians, and bicyclists (of all abilities).	BDOT	Short
Bicycle Transportation Planner/Program Manager Staff	Assign a staff person to monitor this plan and create a transportation planning position and/or bicycle and pedestrian planning position when there is a critical need for a new hire to accommodate the demands of the position.		Short - assign a responsible current staff member Mid - hire a staff member to become the bicycle and pedestrian planner
Create and adopt a bicycle parking policy	This policy should reflect a minimum number of parking spaces outside each building, secure parking spaces for resident students (or availability to store bicycles in dorm rooms, offices, and other campus buildings), and standards for secure parking in or around new buildings.	Parking Authority of Baltimore City (Currently offers secure parking in garages - example of policy/rules/regulations)	Short - adopt a policy Ongoing - implement policy action items

POLICY			
Recommendation	Description / Rationale	Supporting Agencies	Implementation Time Frame
Minimize impediments to bicycle access onto and off of campus via surrounding roads and facilities	Minimizing impediments to bicycle access will establish a more freeflowing network that is convenient and encouraging. One example is to shorten the parking gate arms at campus parking lots. Shortening these arms will remove a deterrent and allow for greater access.		Short
Reevaluate parking policies	Determine if parking policies can be modified to reduce congestion and offer incentives for using transit and bicycles for commuting.		Mid
Establish a relationship with a member of, or seek representation on the Mayor's Bicycle Advisory Committee (MBAC)	This group can help advocate for improvements in and around campus and will be abreast of current planning and implementation efforts citywide.	MBAC	Mid
Explore the possibility of providing free Charm Cards (for travel on area transit) to those who register their bicycles. Cost could be covered by student or transportation fees.	Encouraging transit use can reduce congestion and vehicular parking demand on campus.	MTA	Mid
Explore a Guaranteed Ride Home policy for those who register their bikes	Offer a limited number of taxi vouchers per semester to individuals who sign up as an alternative commuter (carpool, bicycling, walking, or transit), to provide a guaranteed way to get home should the need arise (or explore partnering with Uber). A limiting factor in getting more adoption for alternative transportation is the fear that an individual will be stranded on campus should something unforeseen arise; a guaranteed ride home program helps to partially allay these fears. The amount of the benefit could be capped to prevent excessively large taxi fees while helping to provide peace of mind.		Mid
Offer free parking passes (i.e. 10 per semester) to those who regularly bike to campus (for faculty and employees who pay for parking)	The university could offer several free parking passes to those who normally commute by alternative method, but have the option for bringing a car to campus a few times per semester.		Mid

POLICY		Supporting Agencies	Implementation Time Frame
Recommendation	Description / Rationale		
Establish a Campus Bicycle and Pedestrian Advisory Committee	This group will help staff uphold the recommendations of this plan, advocate for changes at the City level, and make decisions about key projects.	DOT SHA Bikemore Bike Maryland	Mid
Create a Transportation and Sustainability Department	As the University grows, add this department to house all responsibilities and personnel related to transportation services (including bicycle planning).		Mid - Long
Establish a budget for bicycle and pedestrian planning, implementation, and programming	Creating a separate budget will allow the University to fund projects and monitor trends in bicycle related expenditures.		Mid - Long

NETWORK AND FACILITIES

An enhanced network of bikeways and end of trip facilities will greatly improve the bicycle friendly status of MSU. Since the campus is located within the City of Baltimore, many of the recommended improvements that effect the circulation and access for students and faculty are located on City owned roads. This emphasizes the importance of communicating with BDOT and working with the City to understand funding, phasing, and design development. The map on page 5-6 illustrates network and facility improvements.

The network will include on- and off-road modifications that will improve safety and circulation in and around the campus.

Intersection improvements will be a key component to increasing safety for those accessing campus. Hillen is noted on the Baltimore Bike Map as an unsafe road for cyclists. While improvements to the roadway may not be funded until the long- or future-term, intersection improvements are critical to the safety of all modes. Intersection improvement best practices can be found in Chapter 6.

Bicycle parking is also a critical component of facility improvement. Currently many of the available bicycle parking options on campus are in disrepair and do not comply with minimal acceptable standards.

Other facility improvements include runnels on key stairways to shorten travel distances, future pedestrian priority zones to reduce conflicts, and end of trip facilities that should be located in strategic locations/buildings as the campus evolves per the master plan.

Short-Term improvements are typical low cost, high impact, high feasibility projects. These can be seen as the low hanging fruit that provide momentum for implementing projects with higher capital costs.

Mid-Term improvements may take additional coordination and fund raising, but also will have a high impact on safety and improved circulation.



RECOMMENDATIONS

- | | | | |
|-------------------------|--------------------------|--------------------------|--------------------------|
| Existing Bike Lane | Proposed Bike Lane | Crossing Improvements | Pedestrian Priority Zone |
| Existing Sharrow | Proposed Sharrow | Runnel Location | MSU Bear Transit Stop |
| Existing Bike Route | Proposed Multi-use Trail | Bike Dismount Zone | MTA Bus Stops |
| Planned Multi-use Trail | Proposed Cycle Track | Recommended Bike Parking | |

0 250 500 Feet



Long-Term projects require in-depth study for feasibility and design. These improvements will be more innovative and provide ideal conditions for bicyclists who may be interested in riding but do not feel safe in the current environment.

Future-Term recommendations provide the most protected facilities and require coordination with and study of vehicular traffic patterns. Potential impacts to vehicles are reduction in lanes and parking takes. Sometimes, these projects can be funded by grants, therefore decreasing implementation timing and becoming a catalyst project for the area.

SHORT-TERM ON-ROAD IMPROVEMENTS

1 *Pentwood Road (On and Off Campus)*

Add sharrows to this bike route to communicate to vehicles that bikes have the right to use this roadway.

2 *East Arlington Avenue*

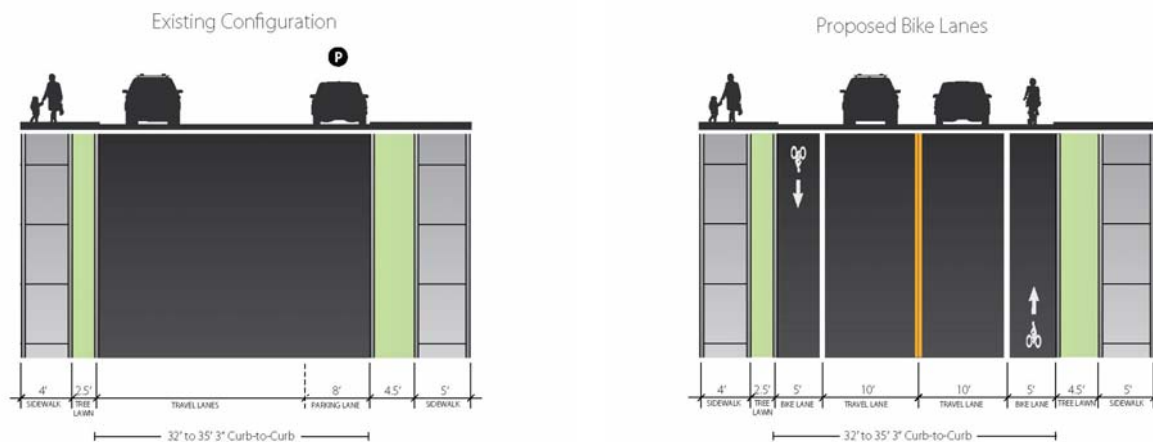
Add sharrows to this one way street that connects Morgan View with the Main Campus.

3 *Tivoli Avenue*

Add sharrows to connect Argonne Drive with Havenwood Road.

4 *Havenwood Road*

Add bicycle lanes. With the surrounding construction and lack of striping it is possible this may be a near-term striping project. If intercepted before striping is scheduled, bike lanes can easily fit within the existing curb to curb dimensions.

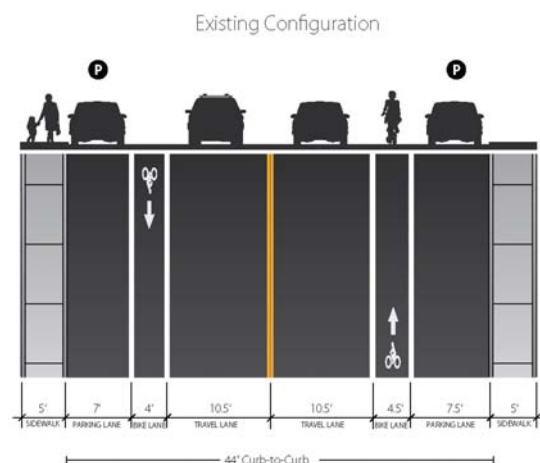


5 *Argonne Drive (Existing Bike Lane from McCallum Drive to the East)*

Watch for this restriping project and increase the width of the bike lanes. AASHTO standards with curb and gutter and parking are 5 foot lanes. Lane and parking stall narrowing may be feasible to increase the width of the bike lane (existing measurements right). Complete the connection to Walther Avenue.

6 *Argonne Drive (from Hillen Road to the West)*

Restripe to provide bike lanes to connect with neighborhoods to the west of campus.



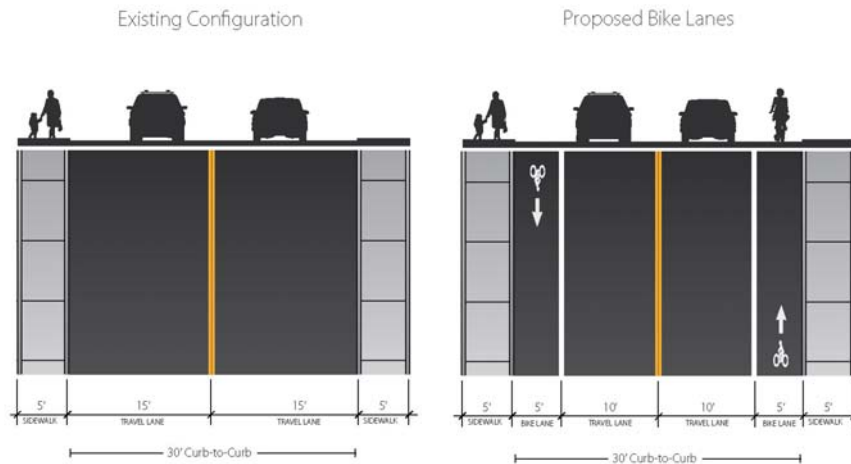
7 Stadium Way

Add sharrows to indicate this is a bike route through campus. Ensure gates provide sufficient clearance for bicycles.

MID-TERM ON-ROAD IMPROVEMENTS

8 East Cold Spring Lane (Within Campus and Connecting with Neighborhoods to the East)

Add bike lanes to provide separation along this critical east/west connection. The section below indicated a potential restriping configuration for the segment of East Cold Spring Lane from Hillen, east, through campus and extended into the residential area beyond.



9 Argonne (Near the Blount Towers)

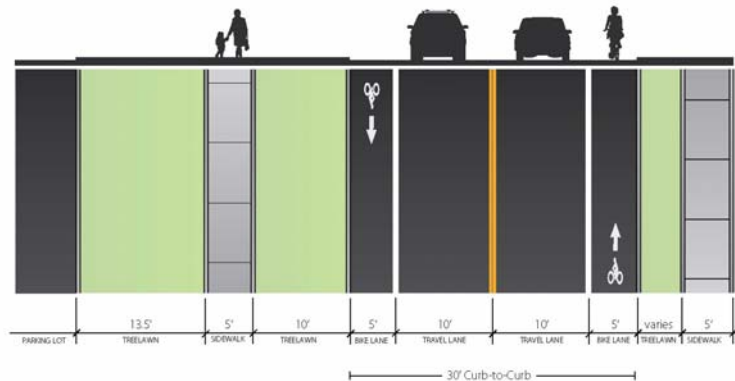
Restripe the road to include bike lanes, or construct a multi-use path within the vegetated strip. Options should be selected based on available funding, feasibility, and cooperation with the City.



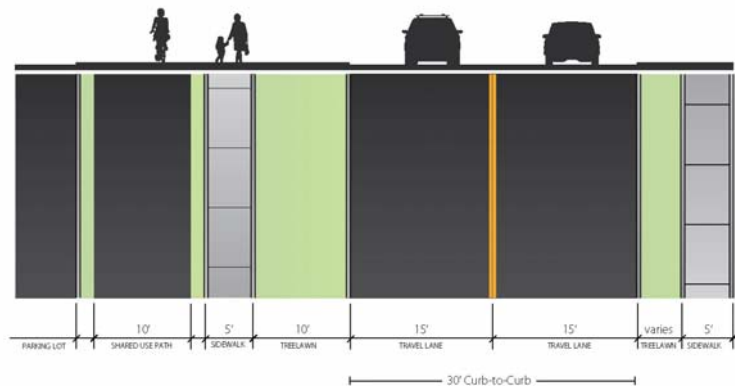
Bike lanes should be implemented, if possible, to connect the existing bike lanes to a transition point where a multi use path may be implemented. Thorough design of on/off road transitions (and accompanying signage) will be required to communicate appropriate circulation and behavior to bicyclists, pedestrians, and motorists. Recommended sections follow on page 5-9.

Argonne (near the Blount Towers) recommended sections:

OPTION 1: Proposed Bike Lanes



OPTION 2: Proposed Shared Use Path



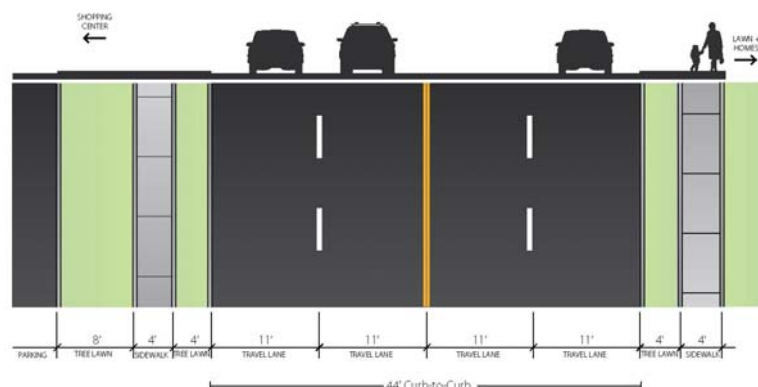
LONG-TERM ON-ROAD IMPROVEMENTS

10 *East Cold Spring Lane (from Hillen Road to the West)*

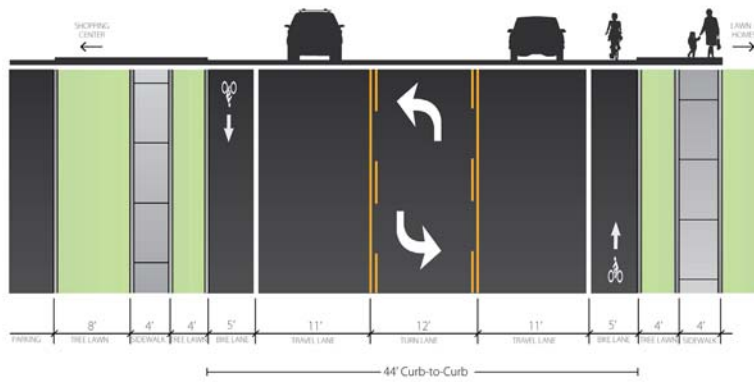
The segment of East Cold Spring Lane between Loch Raven Blvd. and Hillen Road should be vetted for a road diet to accommodate the continuation of this bike lane, or sharrow, at minimum.

The section of East Cold Spring Lane near the cross road of Kelway Road is a candidate for a road diet as indicated on page 5-10.

Existing Configuration



Proposed Road Diet with Bike Lanes



11 Multi Use Path path Along West Side of Hillen Road between Argonne Drive and Havenwood Road

Add a multi use path to complete the connection from Argonne Drive (within campus) to the new West Campus, Northwood Shopping Center, and bike lanes on Havenwood Road. This path should be wide enough to accommodate two-way bicycles and pedestrians (ideally 16 feet if striped for separation or 16 feet of path matching the current character of paths within Central Campus).

FUTURE-TERM ON-ROAD IMPROVEMENTS

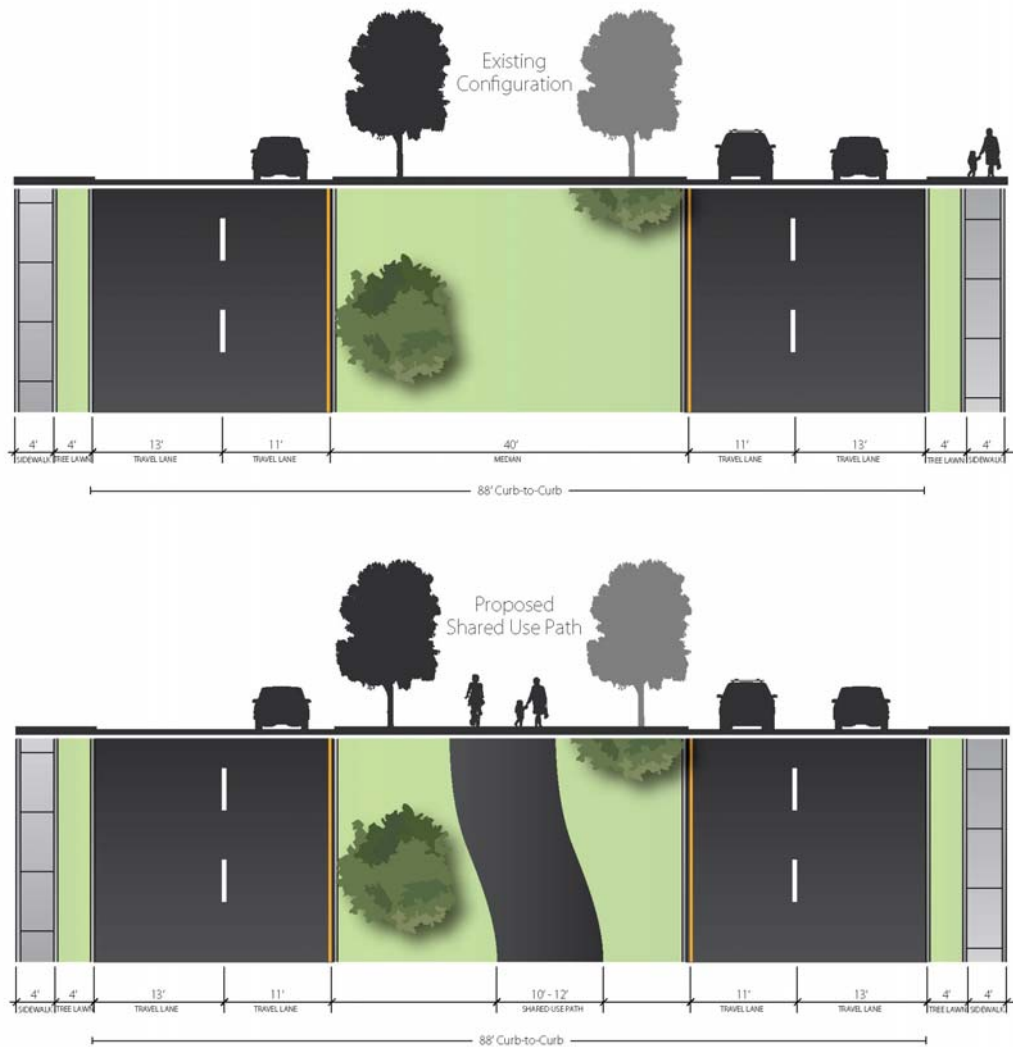
12 Hillen Road

Improving Hillen Road to comply with the City's complete streets policy will be a major transformation for the campus as well as the City. The campus will take a dramatic shift toward becoming bike friendly and residents of Baltimore will gain a well protected north/south route. The recommended cycle track will require thorough feasibility studies with community input. Parking loss will need to be understood, but can be compensated for with various methods which should be selected to suit the current contextual and cultural environments.



13 Loch Raven Boulevard

As the campus expands to the west Loch Raven Boulevard becomes a significant circulation route for students and faculty. Transit stops along this roadway also serve local residents. As the bicycling mode share increases, the median provides an opportunity to preserve roadway dimensions while providing a multiuse path for pedestrians and bicyclists. This option would require participation from the City and integration of the facility into the Baltimore Bike Plan.



SHORT-TERM OFF-ROAD IMPROVEMENTS

Dismount Zones

Creating dismount zones for bicyclists (and other wheeled devices, i.e. skateboards) will reduce conflicts across pedestrian bridges. Installing signage and enforcing rules are the key to success. Dismounting will slow everyone to walking speed to reduce conflicts. Dismount zones are common on University campuses and pair well with well placed bike parking and safe, well connected routes that divert bicyclists around the dismount zone (where applicable). Potential dismounting zones are shown on the map on page 5-6.



SHORT- TO LONG-TERM OFF-ROAD IMPROVEMENTS



Add Runnels to Stairways

Runnels in strategic locations can create connections for bicyclists that they otherwise may be inclined to avoid. By adding channels to stairways for bike tires, bicyclists can continue along straight line paths across topographic changes.



MID-TERM OFF-ROAD IMPROVEMENTS

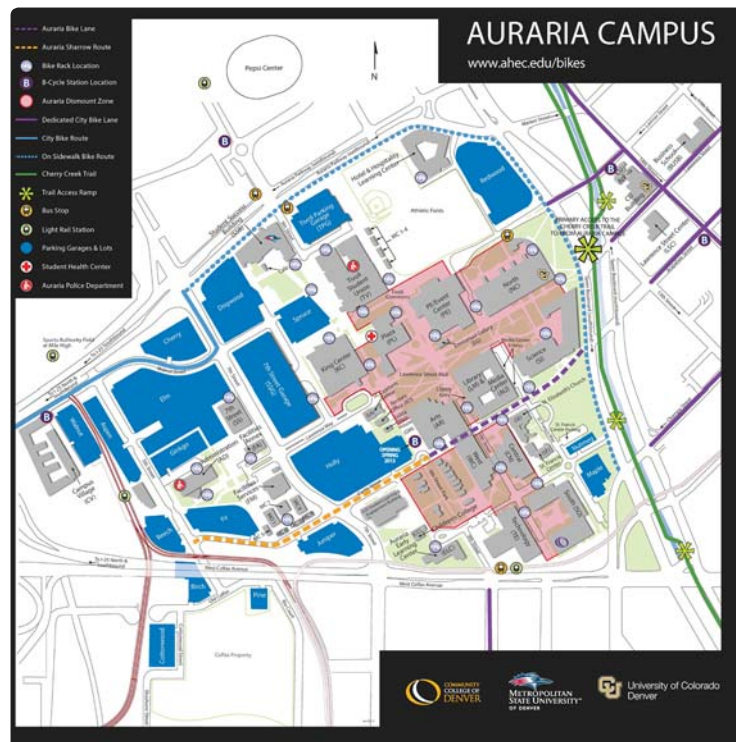
14 Widen the Path and Create a Bypass on North Campus

Widening this path will provide an off-road route for less experienced bicyclists. Bypassing narrow passages/breezeways will prevent bike/ped conflicts.

FUTURE-TERM OFF-ROAD IMPROVEMENTS

Create a Pedestrian Priority Zone in the Center of Campus

This pedestrian priority zone will need to be implemented with signage and enforced by campus police. This may become necessary when a critical mass of students and faculty are circulating on bicycles and they need to be advised to slow speeds and yield to pedestrians in the center of campus. Priority signs will be posted along the edges of this zone. (See examples below).





INTERSECTION IMPROVEMENTS

Intersection improvements are imperative to the safety of students and faculty. The first priority in the short term is to upgrade all intersections with high visibility crosswalks. Hillen presents the most immediate need, followed by crossings internal to campus and then others throughout the context. These modifications can be coupled with roadway improvements. MSU should work with the City to understand how on-street bikeways may be prioritized and couple the adjacent intersection improvements with the roadway improvements. If the City will not be making roadway improvements within two years, the University should work with the City to implement pedestrian and bicycle improvements in the short term. For intersection improvement guidance see Chapter 6. All intersections should be modified to the highest standards in safety and comply with Complete Streets Policy and ADA requirements.

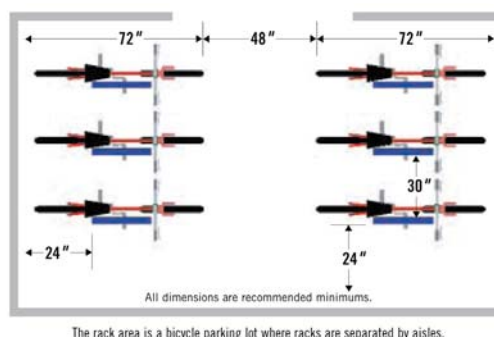
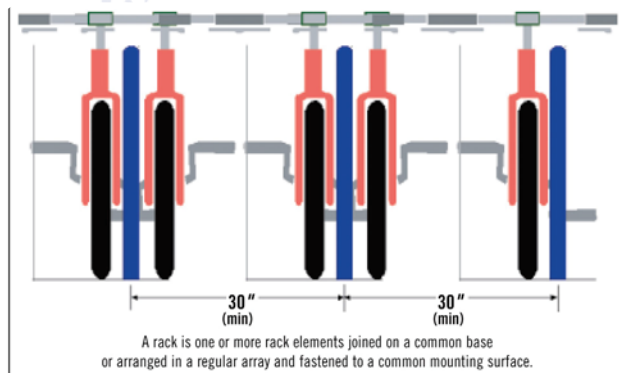
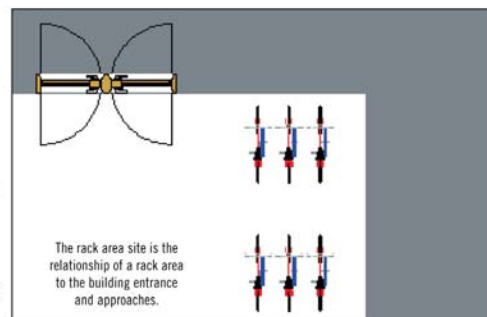


BICYCLE PARKING IMPROVEMENTS

Bicycle parking on campus should be upgraded in the short-term. Several existing racks are not secure, are rusted, and not usable. The best example of parking can be found on North Campus at the Center for the Built Environment and Infrastructure Studies (CBEIS) building. Bicycle parking at the CBEIS building consists of the preferred inverted "U-style rack," are properly spaced, and are covered by the building so the racks are protected from the weather. Bicycle parking throughout campus should be upgraded in a similar design to better accommodate on-campus residents and visitors.

Purchasing bicycle parking requires knowing a few basic standards - see the standards below as indicated by the Association of Pedestrian and Bicycle Professionals (APBP). Barriers to entry in assessing these products are low and provide a branding opportunity through customized colors and logos. The following standards are emblematic of good parking equipment.

- U-lock compatible: parking must enable the user to attach a "u-lock" to the rack and to their bicycle
- Two-Point Locking and Support: u-locks must be able to attach to the rack by passing through the bicycle at two locations (typically the bike's front wheel and bike frame's down tube).
- Secure anchoring to the ground, preferably into a concrete base
- Easy for university staff to remove or relocate
- Some racks come with asphalt mounting kits that do not require concrete repair work to remove or relocate
- Rust-preventative coating and appropriate tube thickness to prevent cutting. Common metal coating types include: powder coat, thermoplastic, or galvanized steel.
- Weather protected: Where budget will allow, overhangs to protect bikes from weather are recommended.



Creating a Bike Parking Design Standard

When choosing bicycle parking solutions, university officials must balance the need for low- to medium- cost solutions with a variety of other considerations such as usability (is the parking solution intuitive?), capacity (number of bicycles per rack/corral), aesthetics, and pedestrian maneuverability.

The Association of Pedestrian and Bicycle Professionals (APBP) created the *Bike Parking Guide*, now in its 2nd Edition, to help cities and organizations choose bicycle parking and create design standards. Of the racks reviewed in the 2nd Edition guide, only the following meet all of the APBP design criteria:

- Inverted-U Rack
- Post and Ring Rack
- Bicycle Corral (APBP calls this an “Inverted U Series”)

Although racks that hold multiple bicycles are more expensive in the short-term, investing in a few low-capacity racks will likely mean the university must purchase more racks in the future. Overcrowded racks accelerate the demand for bicycle parking. Too many bikes attached per rack causes unattractive piles of fallen bicycles and irritation or danger to pedestrians. Diversifying bicycle parking types and providing enough spaces to meet future demand would result in a more sustainable bicycle parking supply.

Short-Term Bike Parking

Short-term bike parking should follow the following requirements:

- Rounded “wave” parking is discouraged because round tubing is easy to cut. Wide square Inverted-U designs are preferred.
- Properly anchoring all short-term parking options by using tamper-proof Spike Anchors will ensure that racks cannot be dislodged and stolen or sold for scrap metal.
- A coating should be applied to protect the parking from the elements.
- Staggering racks helps cyclists easily park or remove their bike.
- Racks should be placed parallel to the sidewalk to maximize pedestrian space.
- Maneuvering space at the edges of racks provides clearance for bicyclists to move bikes.
- Bicycle rack siting should correlate with high-traffic areas and connect destinations throughout campus.

Inverted-U style racks are designed to hold bicycles parallel to the rack. When parked perpendicularly, bikes are more susceptible to falling, which can cause tripping hazards or other mobility issues. To prevent this, the university can produce inexpensive, waterproof stickers for racks that read, “Park parallel to rack”. If students or staff incorrectly attach bicycles to parking—by using only cable locks or by locking only one wheel—bicycles are more likely to fall over. Again, inexpensive stickers or posters that read, “Always use a U-lock. Attach U-lock to frame AND wheel” are simple and inexpensive ways to mitigate against these problems.



Bicycle Corrals

In contrast to bicycle racks, which are usually placed on sidewalks, bicycle corrals are used on in-street locations, along the curb. MSU can integrate bicycle corrals alongside its pedestrian facilities, instead of the traditional on-street placement. Because rows of fixed, conjoined, Inverted U style racks typically serve ten or more bicycles at a time, they are usually placed in high-traffic areas. Bike corrals' durability and high-profile nature help portray bicycling as a realistic and attractive mode of transportation.



Although MSU currently has low levels of bicycle riders, installing at least one bicycle corral could increase bicycling's presence on campus. Installing a corral near a high-profile university building would show that the university is committed to increasing bicycle mode share. MSU can consider installing a smaller sized bicycle corral, designed to hold fewer bicycles, and then increase the capacity in the near future.

Security Features and Considerations:

- Two Point Locking– Inverted-U design allows users to fit U-locks through the bike's front or rear tire and the bike frame and then attach the bike to the rack.
- Strength in Numbers– The welded steel rails in between the racks make corrals less susceptible to vandalism than a single inverted-U rack.
- Fixed location—When screwed into concrete, bike corrals are sturdy and resist removal by vandals.
- Protection from cars—Bollards or concrete curbs may be added near bicycle corrals. MSU's pedestrian environment means this will likely not be necessary.
- Visibility—Newly installed corrals are eye catching in and of themselves. Adding reflective material in addition to adequate lighting can increase visibility.
- Lighting—Place in a well-lit area with high foot traffic.
- Discourage placement at the side of a building.
- Place no more than 100 ft from a building entrance.
- Rack spacing: For ease of use, space racks a minimum of 36 inches apart.
- Coverings should protect bicycles from weather, however they should not be completely enclosed. Leaving open space under an awning allows owners to see their bicycles and protects against feelings of insecurity and danger to personal safety.

Indoor Bicycle Parking

Indoor bicycle parking should be as user-friendly and secure as possible. A number of options exist for indoor parking, including the ability to retrofit existing spaces for bicycle storage. About 40% of MSU freshmen students choose to live on campus. Improving bicycle parking locations and improving bicycle parking policy could influence students' decisions to bring bicycles with them to campus, sparking a stronger campus bicycle culture from the first year onward.

Types of indoor facilities:

- Bicycle-friendly housing policy: in-unit storage
- Bicycle-friendly housing policy: indoor bike room
- Indoor bike rooms in high traffic campus buildings (Michigan State University, right)



In-Unit Storage Policy

Drafting an official university policy regarding campus housing and bicycle storage would officially enable students, faculty, staff, and visitors to bring bicycles into all campus buildings. Publicizing this policy by posting notices in university-owned housing buildings and throughout campus would help create awareness of this new policy.

Indoor Bike Rooms

Transportation Alternatives, a non-profit advocacy organization has developed a guide to bike parking. Although geared for a corporate audience, three rules resonate for indoor bike parking:

- Bicycle racks can be installed in almost any space.
- Generally speaking, a space of 14 feet by 6 feet can store up to a dozen bicycles.
- Each bicycle parking space should be accessible to the user without having to move another bicycle. Generally, horizontal parking will require 2 feet by 6 feet per bicycle parking space. For vertical parking, you will need 4 feet by 2 feet and a height of 6 feet for each space. Finally, you should provide for an aisle of at least 5 feet wide to allow room for maneuvering.



Long-Term Bicycle Lockers

Outdoor bicycle lockers are another long-term bicycle parking option, particularly for residential buildings. Bike cages provide fully-enclosed "cage" storage for a single bicycle per locker. Campus systems usually charge per annual rental and are usually operated via a unique key.

The University of Minnesota is one example of a university campus that offers bike locker parking options. Yearly rental is \$85 per year (\$7 per month) although other schools have lower rates. Minnesota's online locker request form streamlines the ordering process. Bike lockers can be combined with places that already accommodate car parking.



MID-TERM TRANSPORTATION INTEGRATION IMPROVEMENTS

Add Bike Racks to the Bear Transit Shuttle

As the University makes strides to become more bike friendly and work with the City to improve contextual facilities, the Shuttle should be modified to include bicycle racks. This should be accomplished by retrofitting shuttle buses where possible in the near-term and establishing a goal of having bicycle racks on all buses in the long-term. This will expand the reach of bicycle riders around campus and provide security by allowing students and faculty to travel with their bikes instead of leaving them locked in another area of campus.

Improve Transit Stops

Both shuttle and MTA transit stops located near MSU campus should be improved to provide shelters, queuing areas for people with bikes, maps, and benches. These improvements should allow for sufficient space to board and alight as well as provide clearance for pedestrians moving along the sidewalk.

NETWORK AND FACILITIES SUMMARY			
Recommendation	Description / Rationale	Supporting Agencies	Implementation Time Frame
Identify project locations where roadway rehabilitation/ resurfacing is scheduled; move these projects forward	Understanding repaving and resurfacing schedules allows the University to advocate for bicycle improvements in a cost effective manner	MDOT SHA Baltimore City	Short
Seek funding mechanisms for priority projects (public and private sector opportunities)	Working with other agencies who have an interest in network improvements can lead to more options for grants and other funding sources	MDOT SHA Baltimore City	Mid
Identify and being short-term, low-cost infrastructure projects	These types of projects will become catalysts for increasing mode share and funding other projects that will close gaps in the system	MDOT SHA Baltimore City	Mid
Add bicycle racks to the front of the MSU Shuttle	This will expand the reach of bicycle riders		Mid
Improve area transit stops	Work with MTA to improve stops with shelters, queueing areas for people with bikes, maps, and benches (that provide clearance for sidewalk use)	MTA Baltimore City	Mid
Design and Implement longer-term projects	Work with the city to fund and seek support for the more costly and innovative improvements. Implement on-campus infrastructure projects that require additional funding or more complicated changes to the campus structure (i.e. additional crossings and widening of paths). Tie in to local greenways and trails as they are developed.	MDOT Baltimore City	Long - Future

Programming and Recommendations for Education, Encouragement, Enforcement, and Evaluation

Equally as important as providing bicycle and pedestrian infrastructure is ensuring that users are familiar with the treatments and know how to use them. Education programs targeting the University community are recommended to complement existing efforts at the City level. Similar to education programs, encouragement programs provide incentives and benefits to the public to try bicycling as a mode of transportation.

PROGRAMMING		
Recommendation	Description / Rationale	Implementation Time Frame
Employees/police on bikes	Maintain and increase program as needed.	(already initiated)
Campus Orientation	Distribution of information to incoming and returning students at the beginning of the year through school information packets, including how to share the road with cars, proper (and legal) roadway crossing behavior, locations of bike parking, instructions on how to properly lock your bicycle, facility improvements, programming events, and applicable policies and rules.	Short
Bicyclist Education	Initiate campaign for proper locking techniques and proper behavior. Use flyers, videos, and workshops. Add these subjects to freshman/new student orientation.	Short
Motorist Education	Initiate education program for all students with vehicles to increase awareness of how to interact with multiple modes. Provide information in dorms, through The Spokesman, and flyers posted around campus.	Short
Events and Rides	Encourage students to participate in local bicycling events (like the Tour du Port) and create new events to encourage biking in and around campus. Organize a charity ride or health ride with one of the student organizations. Add additional events each year.	Short
Bike Culture Initiative	Based on efforts by LAB's Equity Advisory Council, research, define, and execute programs aimed at combatting cultural challenges with biking (including bicyclists, future bicyclist, and motorist behavior). Resources: http://bikeleague.org/sites/default/files/equity_report.pdf http://bikeleague.org/sites/default/files/Equity_exhibit_report.pdf	Short
Bicycle/Pedestrian Transportation Services Website	Establish a website to become the clearinghouse for all things bicycle on campus. All policy, registration, programming, events, and local bicycle related news should be posted here.	Short
Bike registration	Implement or improve registration program.	Short
Bike locks provided or lockers	Provide information on where students can purchase appropriate locks on website and in orientation packages.	Short

PROGRAMMING		
Recommendation	Description / Rationale	Implementation Time Frame
Security patrols of bike parking	Add standard for parking checks to the bicycle patrol itinerary.	Short
Stolen or impounded recovery system	Initiate reporting system and recovery procedures based on updated bicycle registration.	Short
Police training for bicycle behavior and motorist behavior around bicyclists	Partner with local advocates and city law enforcement to initiate a training program for Morgan and surrounding Universities (also train and partner with Campus Safety Patrol).	Short
Helmet/Light enforcement	Comply with local city enforcement – change enforcement policy as city changes their policy.	Short
Dedicated funding source for implementation	Segment Facilities and Planning budget to include bicycle infrastructure and programming. LONG TERM: Eventually this will become part of the Transportation budget.	Short
Crash data/incident data	Work with the city to understand how they collect bicycle crash data. Ensure the University monitors crashes within the immediate context of the campus. Implement a program by which this is tracked internally.	Short
Ticket diversion	Initiate Diversion Program whereby students who receive tickets on campus can elect to attend a motorist, bicyclist, and pedestrian safety clinic. Satisfactory participation and learning will be gauged by the instructor who will administer a certificate of completion for use as payment of the fine.	Mid
Safety/skills/commuter/repair workshops	Initiate education programs for proper behavior and care/maintenance. Explore potential of adding a self-serve repair station on campus.	Mid
Bike share or rental program	Advocate for a Charm City Bikeshare station on campus. (Pending implementation of planned bike share).	Mid
Planning Department or Engineering Department Transportation Planning Classes	Add a class for bicycle and pedestrian planning to the Engineering School or the School of Architecture and Planning.	Mid
Leagues Cycling Instructors or classes	Partner with local LCIs in the Baltimore area to offer classes through PE or as a part of a ticket diversion program.	Mid
Tracking	Initiate official count program by adding this to a program's curriculum. Set standards for data collection and reporting.	Mid
Buddy Programs	Initiate a buddy program where interested bicyclists can sign up to partner with a buddy to bike to campus. This can be for commuting or recreation. Provide a page via a new Bicycle Programs website for joining as a buddy ambassador and as a participant looking for a buddy.	Mid

PROGRAMMING		
Recommendation	Description / Rationale	Implementation Time Frame
Bike to Campus Day/ Competitions	Organize a Bike to Campus Day Competition. Student organizations, years, departments, or classes can sign up as groups to compete in this activity. Student organizations can lead this program. Donations from local bicycle shops can become prizes for participants and winners.	Mid
Conduct seasonal bicycle counts	Count the presence of bicycles along routes as well as inventory parking demand. This will provide data for supporting the development of new bicycle facilities and help determine parking demand and when additional parking will be needed.	Mid
Create a non-motorized transportation report card	Begin monitoring and setting benchmarks for: Trip Demand, Mode Share, A Program Coordinator, and the Bicycle (and Pedestrian) Advisory Committee	Mid - Long
Cycling teams/clubs/coops	Add a student group or club for those interested in becoming a cycling "team." This team may meet periodically and discuss relevant news and/or participate in local events together such as Bikemore events.	Long
Update Bicycle Plan	Update the plan (at least) every ten years.	Long
Satisfaction survey for bicyclists, yearly	Initiate best practices for satisfaction survey.	Long
Cycling offered in PE	Initiate a cycling program in PE as infrastructure in and around campus provides safe facilities. Also consider investing in bike rental program and bikes that can be used for traveling cycling programs. Consider Lake Montebello as a location for fitness/PE cycling with borrowed bikes.	Long
Submit for Bicycle Friendly University Status	Submit application when yearly audit reflects similar status ratings to other Bronze level universities.	Long - Future

Potential Funding Sources

Funding strategies are a primary focus for all new bicycle-related services and facilities on a university campus. Facilities that are lower in cost, need minimal improvements, and can be tied in with other construction projects are easier to implement and should be considered a priority for implementation if they provide logical connections.

Implementing the MSU Plan recommendations will require new sources of funding to be identified and focused on bicycle transportation improvements. Universities typically draw upon the following sources of funding to construct bicycle and pedestrian facilities and supporting infrastructure:

- **Student Fees:** Student fees are one supplemental source of funds. At the beginning of the school term, in conjunction with tuition costs, students pay various mandatory and optional fees. These fees often support many programs run within the university. A mandatory fee could be added to the annual list of student fees (as a reallocation of existing total fees, not an increase) that would provide a stable source of bikeway funding. This type of fee will require the support of MSU's Board of Regents in order to be implemented. Even a modest \$10 bicycle transportation fee would yield nearly \$79,000 annually. *(This may be a longer term source for MSU as there is no desire to raise current fees).*

- **User Fees:** These can be generated from campus parking costs (permits, daily use, etc.), parking citations, or as a charge to private entities utilizing university facilities. These funds can then be used for construction and maintenance of campus bikeway facilities.
- **Campus General Funds:** Once built into the budget, these can become a regular source of funding for bikeways. Allocating a consistent level of annual funding to bikeways, supporting facilities, and programs is the most dependable way to ensure the continued implementation of the Plan.
- **Sustainable Campus Initiative Fund:** A portion of student fees can be allocated to this fund. Any student can apply for funding to engage in a sustainability project on campus. Applications must indicate economic, social, and scientific means by which their program contributes to sustainability and should be created in collaboration with a faculty or staff member.
- **Capital Improvement Funds:** General funds as allocated by the University for Capital Improvements. MSU uses CIP funds to construct new buildings and facilities. These funds can also be used to build bikeway facilities when they are linked to the growth and evolution of the University's future. Construction and expansion of new buildings often impact desired bicycle corridors. Such construction provides an opportunity to implement the bicycle recommendations included in this master plan on a piecemeal basis within individual site designs.
- **Various Grant Funding Sources:** Funds awarded by a variety of sources based on applying for and meeting standards of the grant requirements. Funds are not repaid to the source, but stipulations may exist for how and when to use the money awarded. Grants are a popular source of funding for bicycle facilities and programs. They are available from both public and private funding sources. Grant funding cycles and amounts vary widely by source and may require matching funds. Some grants are designed to foster and support partnerships between city or county governments, non-profit organizations, and local businesses to improve the environment for bicycling in the community. Grants primarily fund the construction or expansion of bicycle facilities such as bike lanes, trails, and paths. The grants committee also considers advocacy projects that promote bicycling as a safe and accessible mode of transportation.
- **Federal and State Funds:** The University should explore the various federal and state funding sources, which are distributed by state transportation agencies (such as MDOT) and metropolitan planning organizations (such as Baltimore Metropolitan Council). Universities can be eligible for federal transportation funds, but it is recommended that the university partner with the City to demonstrate partnership and improve the chance of success. Doing so will also establish greater continuity between City and University bikeways. Bikeway projects possessing mutual benefits to the City and the University would be likely be strong candidates for federal funding sources.
- **MAP-21 and CMAQ:** Morgan State University may also be a candidate for various funding sources including Transportation Alternatives under MAP-21 (Moving Ahead for Progress in the 21st Century - scheduled for reauthorization in 2014 and subject to change) and Congestion Mitigation and Air Quality (CMAQ). The TE program is a federally funded program for projects that "enhance the cultural, aesthetic and environmental aspects of the nation's intermodal transportation system." Provisions for bicyclists and pedestrians are one of the 12 qualifying categories for TE funds. Projects funded by TE typically range between \$100,000 and \$500,000 with 20% local matching funds required. The Congestion Mitigation and Air Quality (CMAQ) Program provides a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Eligible projects include transit improvements, bikeways, and walkways.

- **Alumni Donor/Gifts:** Funds from donors may be collected via various campaigns and efforts of the University. Alumni donations and gifts are common sources of funding for universities. While these funds may not be as regularly accessible as those obtained through grants or student fees, they can often be the largest source of funding available to the University. Alumni generosity can be acknowledged through various forms of recognition, including naming rights, plaques, ceremonies, programs and other events. These efforts can be coordinated through the MSU Alumni Association.

How To Implement This Plan

The recommendations within this plan are meant to become the road map to successfully modifying the policies, programming, and physical environment of Morgan State University to create a place that matches the vision of this Plan. Success will require effort from staff, faculty, students, Baltimore City, and local citizens to fulfill the vision of a bicycle friendly campus. As all plans should be, this document is considered a workbook. It should be consulted multiple times during the year to ensure implementation is being monitored. It will also likely be adjusted and modified each year as the campus grows, changes, and is affected by the City around it. While all recommendations may not be implemented exactly as suggested, yearly monitoring with a non-motorized transportation report card will help University Planners realign goals, funds, and initiatives to increase the safety and circulation in and around Morgan State University.

Nationally, the average family with an income less than \$50,000 spends 28% of its annual income on housing — and 30% on transportation.

Brookings Institution, "Commuting to Opportunity: The Working Poor and Commuting in the United States," 2008

The annual cost of owning and operating a bicycle is \$308 compared to \$8,220 for the average car.

Pocket Guide to Transportation 2009, Bureau of Transportation Statistics, 2009



Chapter Six

BEST PRACTICES

Overview

There are established best practices for the design and implementation of an effective bicycle system that integrates well with vehicles, transit, and pedestrians. These best practices should be followed to meet the City's and University's goal of enabling and encouraging active transportation and transit in the area around Morgan State University. The following key practices guide infrastructure, policy, and programming recommendations within this Plan.

Connected Networks

Providing a continuous network of bicycle facilities allows users to reach their destinations in a safer and more efficient manner. When bicyclists or pedestrians can navigate a network without gaps, their experiences are generally more positive, which increases the likelihood that they will commute by biking or walking in the future.

A well-connected bicycle network involves bicycle facilities that do not "drop" and leave bicyclists unexpectedly without a designated facility. The bicycle network should have a mix of facilities for riders of various types (e.g., 'interested but concerned' versus 'strong and fearless'). For example, bicycle lanes are more appropriate for experienced users,

while bicycle boulevards (low volume streets with traffic calming) are often better for less experienced bicyclists.

Accommodate All Users at Intersections

Intersections have increased conflicts due to the multi-modal nature of the space. The following key principles from the *NACTO Urban Street Design Guide* should guide intersection design in the study area:

- Design intersections to be as compact as possible – Compact intersections reduce bike and pedestrian exposure to other traffic, slow traffic as it approaches a conflict point, and increase visibility for all users.
- Analyze intersections as part of a network, not in isolation – The impacts of a particular intersection reconfiguration should be considered in the context of a network. Tradeoffs may be possible between the intersection and the network.
- Integrate time and space – Congestion or delay may be mitigated through reconfiguring the timing of signals, rather than through widening lanes.

In addition to the design principles above, intersection treatments for bicyclists (and pedestrians) highlight their presence and improve user comfort and safety. The following treatments are recommended in the study area.

Intersection crossing markings

guide bicyclists through the intersection by highlighting their intended path and providing a clear boundary between the paths of bicyclists traveling through the intersection and motor vehicles traveling either straight or executing a turn. Markings can be provided in a variety of forms, including a line of shared lane markings, chevrons, or colored pavement.

Bike boxes are designated zones at the start of traffic lanes at signalized intersections that allow bicyclists to get ahead of queuing traffic during the red signal phase. By providing a designated space for bicyclists, this can help bicyclists turn left at intersections by allowing an easier transition across travel lanes. Since bike boxes are typically delineated with color to improve visibility, they can reduce the risk of a “right hook” from motorists turning right in front of approaching bicyclists. Pedestrians also receive potential benefits from the installation of bike boxes because they reduce vehicles encroaching into the crosswalk.



Bike boxes allow bicyclists to get ahead of queuing traffic.

Bicycle detection at intersections allows bicyclists to trigger a traffic signal without the presence of motor vehicles. This helps to reduce delay in bicycle travel and increase safety by reducing the need to run red lights. Bicycle detection should be provided in conjunction with signage or pavement markings to clearly inform bicyclists how to

detect the signal. Methods of bicycle detection include in-pavement loops, video, microwave, or push buttons.

Median refuge islands provide a protected space for pedestrians and bicyclists in the middle of the road to allow the user to focus on crossing traffic in two phases and wait for acceptable gaps in traffic. Median refuge islands reduce conflicts because they minimize exposure of bicyclists and pedestrians to motor vehicles.



Refuges improve safety at crossings.

High visibility continental crosswalks can increase motorists' awareness of pedestrians crossing. Advance yield lines placed prior to crosswalks at uncontrolled intersections can encourage motorists to yield to pedestrians more quickly, and improve sight distance for all users. Flashing beacons and in-pavement flashers at crosswalks (a type of flashing beacon) can also alert motorists to the presence of pedestrians crossing and increase yielding.

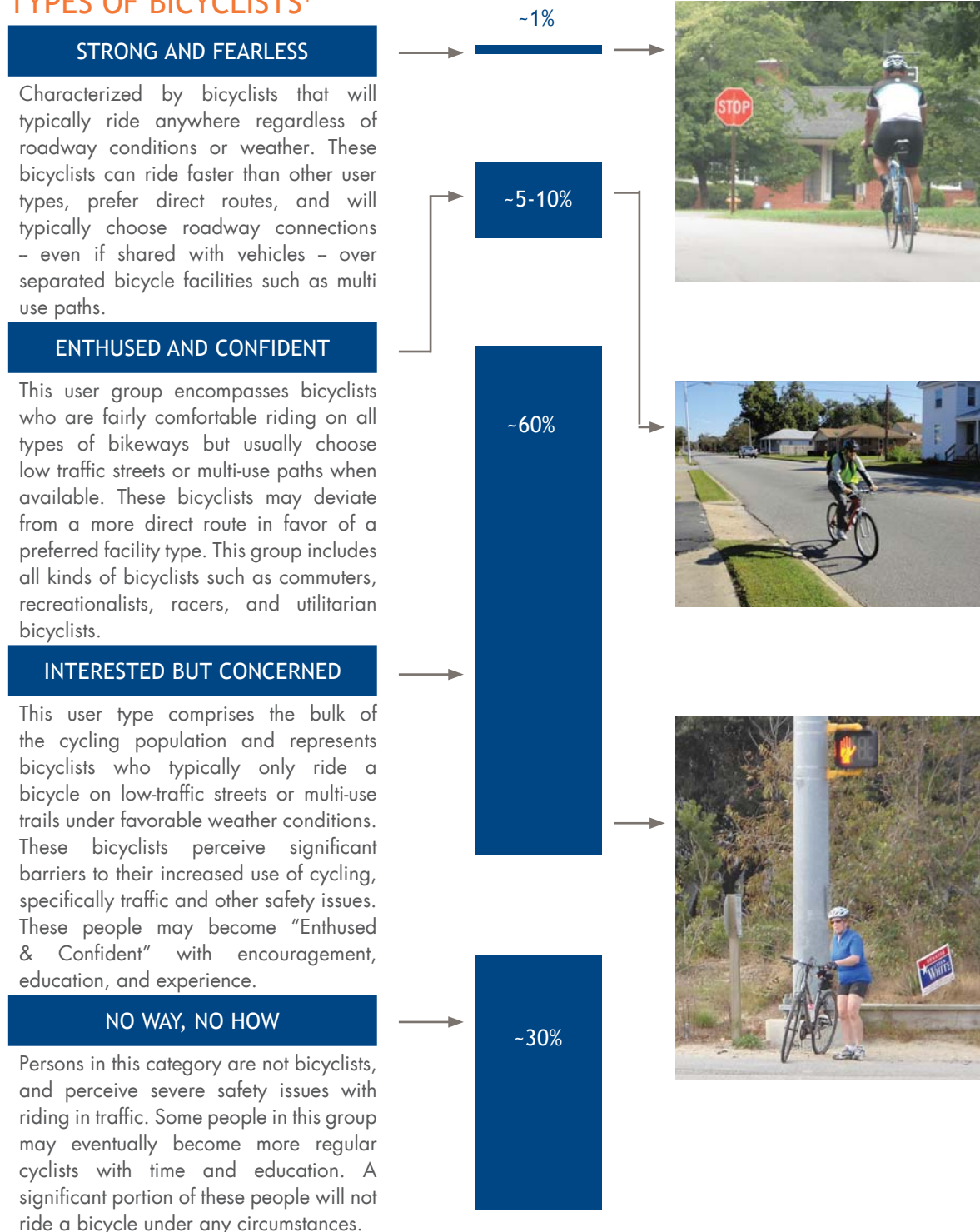


High-visibility crosswalks warn motor vehicles of the presence of pedestrians at conflict points.

Accommodate All Types of Bicyclists

There are a variety of bicyclists of all skill levels. Bicycle infrastructure should accommodate as many user types as possible, with the goal of creating safe bicycling environments to encourage more ridership. A framework for understanding the characteristics, attitudes, and infrastructure preferences of different bicyclists in the US population as a whole is illustrated below.

TYPES OF BICYCLISTS¹



¹ Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation. Supported by data collected nationally since 2005.

Establish Design Guidelines

Street design should begin with an analysis of the street context. A particular street around MSU campus may pass through several different contexts – varying from residential to commercial to institutional – and its cross-section should vary in response to those contexts.

“Street design should both respond to and influence the desired character of the public realm.”

– NACTO Urban Street Design Guide

Context-sensitive design guidelines begin by establishing design controls. Relevant design controls that should vary based on context include the following:

Design Speed – Design streets for the selected target speed rather than observed operating speed. Target speeds should be selected based on street type and context. Generally, 35 mph is the maximum appropriate target speed on urban arterial streets, and 30 mph is the maximum appropriate on urban collector or local streets.

Design Vehicle – Design streets for a ‘design vehicle’ and a ‘control vehicle’. The design vehicle and control vehicle will vary based on the street type. The design vehicle is the largest typical street user and should dictate curb radii and lane widths. The control vehicle is the largest possible user and can be accommodated using the full intersection space.

Design Hour – Collect multi-modal data over 2-3 hours of peak traffic activity to understand how traffic behaves through an entire rush-hour period, and use average levels to design streets and intersections. Street design for peak-hour intervals relieves peak-hour congestion but results in unsafe, unattractive street environments during the rest of the day. Recognize that traffic patterns react to design changes and consider treatments in light of a network.

Design Year – Recent trends have seen traffic volumes leveling off or decreasing on many urban roadways. Transportation models have overestimated volume growth in the past, resulting in many excess capacity roadways. Design based on these recent trends, including

increasing bicycling and public transportation use, rather than assumed vehicular traffic increases based on outdated models.

Several existing guidelines should inform design of bicycle and pedestrian facilities in the study area.

- National Association of City Transportation Officials (NACTO) Urban Street Design Guide
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide
- Association of Pedestrian and Bicycle Professionals (APBP) Bicycle Parking Guidelines
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities
- Manual on Uniform Traffic Control Devices (MUTCD)



The NACTO Urban Street Design Guide was developed by engineers, planners, and designers to lay out the best practices in urban street design for cities across the US.

Provide Education Programs

Most bicyclists do not receive comprehensive instruction on safe and effective bicycling techniques, laws, or bicycle maintenance. Bike skills training courses are an excellent way to improve both bicyclist confidence and safety. The League of American Bicyclists (LAB) developed a comprehensive bicycle skills curriculum that is considered the national standard for those seeking to improve their on-bike skills. The classes available include

bicycle safety checks and basic maintenance, basic and advanced on-road skills, commuting, and driver education.

Increase Awareness

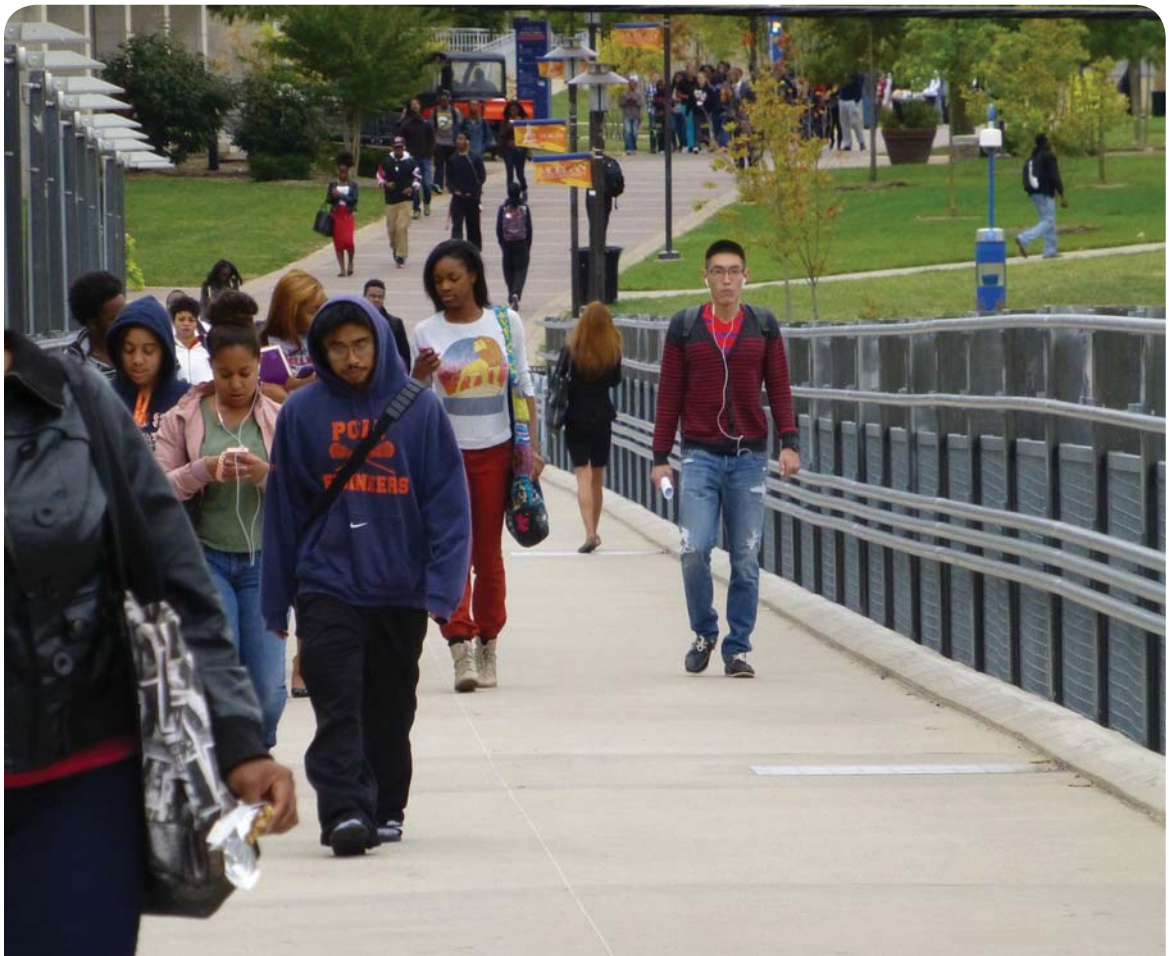
Many residents and members of the university community may not be aware of the bicycle, pedestrian, and transit options that do exist. Awareness campaigns, like bicycle and pedestrian orientation for incoming students and faculty and student bicycle commuter campaigns, can help to communicate opportunities that exist and enhance everyone's awareness of alternative modes. Many programs are already in place through local advocacy groups like Bikemore and Bike Maryland. MSU can encourage students and faculty to participate in these programs. As the culture grows on campus, MSU should also implement their own programs in conjunction with infrastructure investments to spread community support and encourage use of new facilities.

Evaluate Progress

The University and City should track the impacts of implementing the recommendations of this plan through ongoing evaluation of performance measures. Performance measures may include bicycle counts, transit use, university mode share, city mode share, and many others. The survey conducted for this plan can be a starting point for some evaluation measure.

Tracking progress allows the implementing team to communicate successes to the community and adjust recommendations over time. Interim design strategies are recommended on some roadways in the previous section. The City can test ideas through these interim strategies and make decisions about greater cost investments after monitoring before and after traffic use and behavior. In addition to City and University staff, a campus bicycle, pedestrian, and transit advisory committee can be formed to assist with progress reporting and communication with the community.

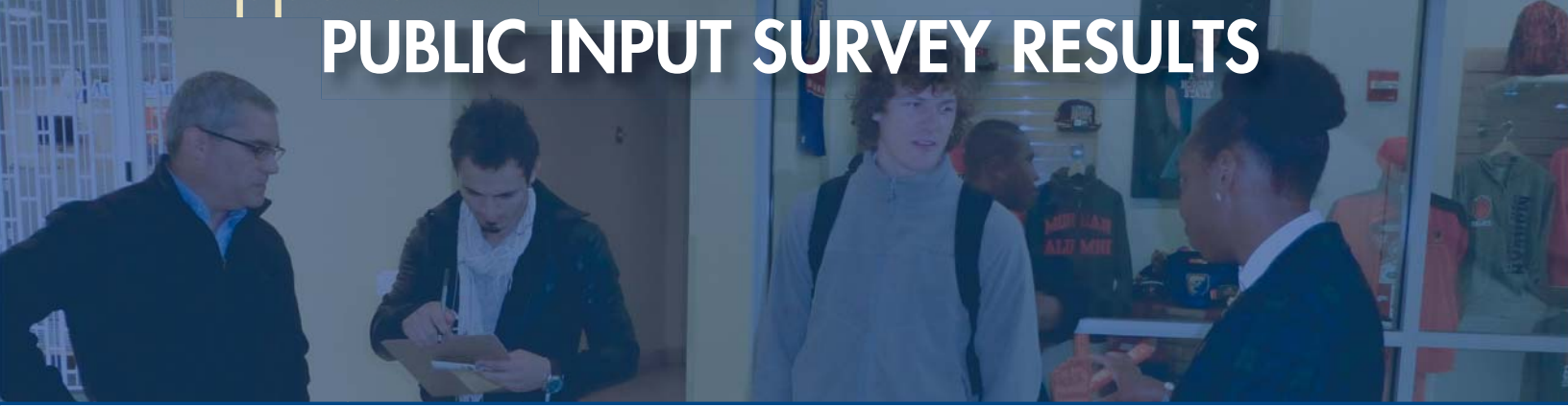
Improving conditions for bicyclists can have positive impacts on all modes by creating separation and establishing rules for safe interaction. This pedestrian bridge is too narrow for two-way bicycle and pedestrian travel. Policies and guidelines for dismount zones will help reduce conflicts.





Appendix A

PUBLIC INPUT SURVEY RESULTS



Overview

The graphs on the following pages are the raw results from the public input survey. A summary of these results can be found in Chapter 3, Needs Assessment.

Morgan State University Bicycle Master Plan Survey

Description: If this is an upload of existing data

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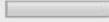
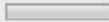

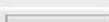
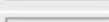
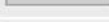





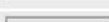
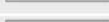
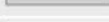

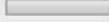
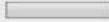




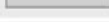
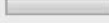
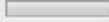
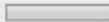

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Total Respondents: 309

Q1. Are you:			
Count	Percent		
141	48.29%	<div><div></div></div>	Undergrad
52	17.81%	<div><div></div></div>	Graduate
99	33.90%	<div><div></div></div>	Other (please specify)
Count	Percent		
1	1.01%	<div><div></div></div>	Adjunct Faculty
1	1.01%	<div><div></div></div>	Administration
1	1.01%	<div><div></div></div>	Administrator
1	1.01%	<div><div></div></div>	alumni staff
1	1.01%	<div><div></div></div>	Alumni/employee
1	1.01%	<div><div></div></div>	contractual employee
1	1.01%	<div><div></div></div>	employee
3	3.03%	<div><div></div></div>	Employee
1	1.01%	<div><div></div></div>	ESL
1	1.01%	<div><div></div></div>	Exchange
1	1.01%	<div><div></div></div>	Exchange Mobility student
14	14.14%	<div><div></div></div>	faculty
16	16.16%	<div><div></div></div>	Faculty
1	1.01%	<div><div></div></div>	Facuty
1	1.01%	<div><div></div></div>	graduate/employee
1	1.01%	<div><div></div></div>	Instructor/Retention Advisor
1	1.01%	<div><div></div></div>	Instuctor
1	1.01%	<div><div></div></div>	partner
1	1.01%	<div><div></div></div>	Postdoc
1	1.01%	<div><div></div></div>	SA Director
16	16.16%	<div><div></div></div>	staff
21	21.21%	<div><div></div></div>	Staff
2	2.02%	<div><div></div></div>	STAFF
1	1.01%	<div><div></div></div>	Staff Member
1	1.01%	<div><div></div></div>	Staff/Student
292 Respondents			

Q2. If you are a student, what is your major?			
Count	Percent		
211	100.00%	<div><div></div></div>	
Count	Percent		
1	0.47%	<div><div></div></div>	accounting
2	0.95%	<div><div></div></div>	Accounting
1	0.47%	<div><div></div></div>	Actuarial Science
1	0.47%	<div><div></div></div>	Arch

4	1.90%		architecture
5	2.37%		Architecture
1	0.47%		Architecture and Environmental Design
1	0.47%		Architecture and planning
4	1.90%		biology
2	0.95%		Biology
1	0.47%		BSAED
2	0.95%		BUAD
2	0.95%		Business
1	0.47%		Business admin
1	0.47%		Business Admin
1	0.47%		business administration
2	0.95%		Business Administration
1	0.47%		coldp
1	0.47%		city and regional pla
1	0.47%		City and Regional Planning
1	0.47%		City And Regional Planning
1	0.47%		Civil engineering
4	1.90%		Civil Engineering
3	1.42%		Communications
1	0.47%		Community College Leadership Doctoral Program
1	0.47%		Computer Engineering
1	0.47%		computer science
2	0.95%		Computer Science
1	0.47%		Construction Management
1	0.47%		Dr PH
1	0.47%		DrPh
1	0.47%		ECE
1	0.47%		Economics
3	1.42%		Elec. Engr
1	0.47%		electrical
1	0.47%		Electrical engineering
1	0.47%		electrical engineering
2	0.95%		Electrical engineering
10	4.74%		Electrical Engineering
1	0.47%		Elementary education
1	0.47%		Elementary Education
1	0.47%		engineering
2	0.95%		Engineering
1	0.47%		Engineering physics
1	0.47%		english
2	0.95%		English
1	0.47%		facs
1	0.47%		FACS

1	0.47%		Folk Dancing
1	0.47%		Graphic Design
1	0.47%		health education
1	0.47%		higher ed administration - ccldp
2	0.95%		Higher Education
1	0.47%		Higher Education Administration
1	0.47%		HOMG
2	0.95%		Hospitality Management
1	0.47%		Hospitality Mgmt
1	0.47%		industrial engineer
1	0.47%		industrial engineering
3	1.42%		Industrial Engineering
1	0.47%		information science and systems
1	0.47%		INSS
1	0.47%		Journalism
1	0.47%		LANDARCH
1	0.47%		M.Arch
1	0.47%		marketing
2	0.95%		Marketing
1	0.47%		math
1	0.47%		Mathematics
2	0.95%		MBA
1	0.47%		MBA Program
2	0.95%		MSW
1	0.47%		Museum Studies
1	0.47%		music
2	0.95%		Music
1	0.47%		Music education
1	0.47%		Music Performance
2	0.95%		Music- Piano Performance
7	3.32%		n/a
9	4.27%		N/A
1	0.47%		NA
3	1.42%		Nursing
2	0.95%		Nutrition Science
1	0.47%		Nutritional science
1	0.47%		P r
2	0.95%		Philosophy
1	0.47%		physical ed.
2	0.95%		Physical Education
1	0.47%		Physical Therapy
1	0.47%		Planning
1	0.47%		political science
1	0.47%		Pre nursing

1	0.47%		Pre-nursing
4	1.90%		Project Management
2	0.95%		psychology
6	2.84%		Psychology
1	0.47%		Psychometrics
2	0.95%		public health
3	1.42%		Public Health
1	0.47%		Public Relations
1	0.47%		Science
1	0.47%		social work
1	0.47%		Social work
6	2.84%		Social Work
2	0.95%		sociology
3	1.42%		Sociology
1	0.47%		SOWK
1	0.47%		Speech Comm.
2	0.95%		Speech Communication
1	0.47%		SPEECH COMMUNICATION
1	0.47%		Speech Communications
1	0.47%		Sports Administration
1	0.47%		Transportatio Engineering
3	1.42%		Transportation
1	0.47%		Transportation & Urban infrastructure
2	0.95%		Transportation Engineering
1	0.47%		transportation systems
3	1.42%		Transportation Systems
1	0.47%		Transportation Systems Engineering
1	0.47%		unkwon
1	0.47%		urban education
1	0.47%		Visual Arts
211 Respondents			

Q3. How do you get to campus? (Check all that apply)


Count	Respondent %	Response %	
97	31.70%	25.19%	Walk
50	16.34%	12.99%	Bike
194	63.40%	50.39%	Car
44	14.38%	11.43%	Transit
306	Respondents		
385	Responses		

Q4. How long is your commute in minutes? (Please enter a whole number only)

Count	Percent	
299	100.00%	
Count	Percent	



Q5. How long is your commute in miles (if you know)? (Please enter a whole number only)

Count	Percent	
226	100.00%	
226	Respondents	

Q6. Do you own or have access to a bicycle for your personal use?			
Count	Percent		
137	45.21%	<div><div></div></div>	Yes
166	54.79%	<div><div></div></div>	No
303	Respondents		

Q7. Are you interested in biking to and/or around campus?			
Count	Percent		
200	66.89%	<div><div></div></div>	Yes
99	33.11%	<div><div></div></div>	No
299	Respondents		

Q8. Have you ever used a bicycle for any of your trips traveling to/from campus?			
Count	Percent		
75	24.83%	<div><div></div></div>	Yes
227	75.17%	<div><div></div></div>	No
302	Respondents		

Q9. What prevents you from considering biking to and/or around campus? (Check all that apply)				
Count	Respondent %	Response %		
122	43.73%	13.51%	<div><div></div></div>	I do not own a bike
58	20.79%	6.42%	<div><div></div></div>	Never thought of it as an option
12	4.30%	1.33%	<div><div></div></div>	My bike is broken
30	10.75%	3.32%	<div><div></div></div>	Bikes are too expensive
90	32.26%	9.97%	<div><div></div></div>	I do not feel safe riding on the road
20	7.17%	2.21%	<div><div></div></div>	I do not feel safe riding on trails
34	12.19%	3.77%	<div><div></div></div>	I do not feel safe riding around campus
25	8.96%	2.77%	<div><div></div></div>	I don't know routes
89	31.90%	9.86%	<div><div></div></div>	My trip is too far
10	3.58%	1.11%	<div><div></div></div>	I take the bus and do not feel comfortable putting my bike on the rack
10	3.58%	1.11%	<div><div></div></div>	I don't know how to ride
16	5.73%	1.77%	<div><div></div></div>	I don't have the right clothes
68	24.37%	7.53%	<div><div></div></div>	I can't take a shower when I get to campus
69	24.73%	7.64%	<div><div></div></div>	Too hard to carry stuff
27	9.68%	2.99%	<div><div></div></div>	Dropping off/picking up kids
70	25.09%	7.75%	<div><div></div></div>	Thefts
86	30.82%	9.52%	<div><div></div></div>	Weather
28	10.04%	3.10%	<div><div></div></div>	I am not interested in biking
39	13.98%	4.32%	<div><div></div></div>	Other (please specify)
279	Respondents			
903	Responses			

Q10. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Length of the trip

Count	Percent		
45	15.31%		Not important
12	4.08%		2
48	16.33%		3
41	13.95%		4
148	50.34%		Very important
294	Respondents		

Q11. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Safety

Count	Percent		
17	5.82%		Not important
14	4.79%		2
33	11.30%		3
34	11.64%		4
194	66.44%		Very important
292	Respondents		


Q12. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Wanting to get exercise

Count	Percent		
20	6.97%		Not important
15	5.23%		2
52	18.12%		3
60	20.91%		4
140	48.78%		Very important
287	Respondents		

Q13. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - On-street bike lane part of the way to your destination

Count	Percent		
26	9.06%		Not important
18	6.27%		2
55	19.16%		3
55	19.16%		4
133	46.34%		Very important
287	Respondents		

Q14. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Off-street bike path or trail part of the way to your destination

Count	Percent		
38	13.48%		Not important
27	9.57%		2
62	21.99%		3
50	17.73%		4
105	37.23%		Very important
282	Respondents		






Q15. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - A place to shower/change/clean-up at your destination

Count	Percent		
40	14.04%		Not important
30	10.53%		2
62	21.75%		3
47	16.49%		4
106	37.19%		Very important
285	Respondents		


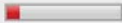


Q16. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Secure bike parking at your destination

Count	Percent		
12	4.24%		Not important
11	3.89%		2
28	9.89%		3
57	20.14%		4
175	61.84%		Very important
283	Respondents		

Q17. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Bike racks on buses

Count	Percent		
78	27.37%		Not important
35	12.28%		2
47	16.49%		3
39	13.68%		4
86	30.18%		Very important
285	Respondents		




Q18. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Protecting the environment

Count	Percent		
29	10.25%		Not important
31	10.95%		2
57	20.14%		3
57	20.14%		4
109	38.52%		Very important
283	Respondents		




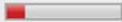

Q19. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - The weather

Count	Percent		
8	2.77%		Not important
12	4.15%		2
44	15.22%		3
60	20.76%		4
165	57.09%		Very important
289	Respondents		

Q20. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Having enough time to bicycle to destination

Count	Percent		
19	6.81%		Not important
19	6.81%		2
43	15.41%		3
57	20.43%		4
141	50.54%		Very important
279	Respondents		

Q21. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - Higher gasoline prices

Count	Percent		
56	19.58%		Not important
32	11.19%		2
64	22.38%		3
46	16.08%		4
88	30.77%		Very important
286	Respondents		

Q22. How important are each of the following factors in influencing your decision to choose to bicycle rather than walk, drive, or use public transportation to get to/from campus? - An increase in transit fares

Count	Percent		
100	34.84%		Not important
38	13.24%		2
64	22.30%		3
23	8.01%		4
62	21.60%		Very important
287	Respondents		

Q23. What reaction do you get from others when you bicycle for transportation? (Check all that apply)

Count	Respondent %	Response %	
51	20.99%	13.18%	No one blinks an eye
54	22.22%	13.95%	Sometimes I get strange looks
56	23.05%	14.47%	I get mostly positive comments/questions
29	11.93%	7.49%	Some people tell me to get on the sidewalk/get off the road
19	7.82%	4.91%	I experience occasional harassment
62	25.51%	16.02%	Some motorists don't seem to see me at all
36	14.81%	9.30%	Motorists see me and act courteously toward me
80	32.92%	20.67%	Other (please specify)
243	Respondents		
387	Responses		

Q24. What can Morgan State and the City do to make you feel safer and more comfortable when you ride your bike, or encourage you to choose a bicycle for transportation to or around campus? (Check all that apply)

Count	Respondent %	Response %	
191	65.19%	9.43%	Separate bike facilities from vehicle facilities: trails, bike lanes, cycle tracks, side paths
156	53.24%	7.70%	Educate drivers and bicyclists on how to appropriately interact
60	20.48%	2.96%	Reduce automobile speeds
93	31.74%	4.59%	Bike commuting workshop
110	37.54%	5.43%	Bike repair and maintenance workshop
130	44.37%	6.42%	Provide free bike tune-ups
111	37.88%	5.48%	Provide bike repair stations around the city
122	41.64%	6.02%	Provide bike repair stations on campus
74	25.26%	3.65%	Bicycling skills class
140	47.78%	6.91%	Provide bikes to rent or share
119	40.61%	5.87%	Information about best riding routes
78	26.62%	3.85%	Incentive about best riding routes
116	39.59%	5.73%	Incentive program (rewards, bonuses)
101	34.47%	4.99%	Organize bike buddies programs
114	38.91%	5.63%	Free equipment like lights, and pumps
159	54.27%	7.85%	Better facilities on campus: secure parking
109	37.20%	5.38%	Better facilities on campus: showers
22	7.51%	1.09%	Other (please specify)
21	7.17%	1.04%	None of the above
293	Respondents		
206	Responses		



Appendix B

GLOSSARY OF TERMS

Overview

The following glossary of terms has been provided as a quick reference for terms used in this Plan.

TERMS

AADT - Acronym for Annual Average Daily Traffic, it is the total volume of vehicle traffic of a highway or road for a year divided by 365 days. i.e. the average amount of traffic for the day.

AASHTO – Acronym for American Association of State Highway and Transportation Officials, a non-profit standards setting body formed in 1914 for transportation engineering planning in the United States. For more information on publications, see AASHTO Green Book.

AASHTO Green Book – Common pseudonym for A Policy on Geometric Design of Highways and Streets, the American Association of State Highway and Transportation Officials' standards, specifications, and guidelines on highway design and construction throughout the United States. The 2011 edition was the 6th edition of the manual.

Annual average daily traffic – See AADT.

ArcGIS – Geographic information system (see GIS) software developed by Environmental Systems Research Institute (ESRI) for working with maps and geographic information, used by planners, engineers, and urban designers. The software allows users to visually represent and analyze data like traffic counts (see AADT), street widths, populations, etc.

Baltimore City Department of Transportation – See BDOT.

BDOT – Acronym for Baltimore City Department of Transportation, a city department of government that manages, plans for, and creates transportation infrastructures for all modes.

Bicycle Friendly University (BFU) - The designation of a Bicycle Friendly University (BFU) is awarded by the League of American Cyclists through their Bicycle Friendly University Program. The program evaluates a college or university based on their efforts for promoting and providing a more bikeable campus and awards various levels of BFU designation if appropriate.

Bicycle or bike – Normally a human-powered, two-wheeled, pedal-driven, single-track vehicle, which is used as a vehicle on and off the road for transportation and recreation.

Bicycle or bike lane – A dedicated lane in the roadway designed primarily for bicyclists.

Bikeway – Any type of on-road facilities that is intended for use by bicyclists, including bicycle lanes, shared use path, or simply a roadway with some form of accommodation for bicycle traffic. A shared lane marking (see SLM) in the middle of a travel lane may make the road a bikeway, even though dedicated facilities do not exist.

Bike box – Delineated area at a signalized intersection between the pedestrian crosswalk and the stop bar for motor vehicles that allows bicyclists to pull in front of waiting traffic, increasing the visibility of bicyclists at intersections during a red light.

Buffered bicycle or bike lane – A bike lane which has either a painted or physical barrier of some sort between it and an adjacent travel lane, increasing the distance between bicycle traffic and motorized traffic, in hopes of decreasing conflicts and encouraging bicycling as a safe form of transportation.

Bulb out – See curb extension.

Combined bicycle or bike lane/turn lane – Places a suggested or provisional bike lane within a turn

lane, suggesting to bicyclists and motorists alike where each vehicle may travel, though the space is not completely dedicated to bicycle traffic. This type of combined lane may be utilized at intersections where there may be too many right or left turners to eliminate the turn lane and/or intersections that are not wide enough to accommodate both lanes.

Cross section – A representation of what the road would look like if one were to cut the road width-wise and look at it head on. It shows the number of lanes and their widths, shoulders, gutters, curbs, and sometimes sidewalks, drains, and other features.

Curb – The edge of the roadway; a raised step where the roadway and gutter pan meet the sidewalk, the latter of which is usually higher than the former.

Curb extension – Also known as a bulb out, this is a traffic-calming method that reduces the distance of crossing the road for pedestrians by extending the sidewalk out into the road, usually as wide as the preceding or proceeding parking lane. Curb extensions can be favorable to bicyclists also since they serve to slow down motorized traffic and encourage walking.

Curb face – Vertical part of the curb, from which road and lane width measurements can be made.

Cycle track – A dedicated bike lane that is physically separated from motorized traffic. Common in European cities and catching on in the United States and in other parts of the world, cycle tracks keep bicyclists and motor vehicles further away from one another, which some consider a safer option than a standard bike lane, though roadway reconstruction or additional construction may be required.

Dismount Zone - A dismount zone is a designated location where bicyclists are required to start walking their bicycle, typically at the start of an area where bicycle riding is not allowed. Dismount zones are often indicated via a sign or marking.

End-of-Trip Facilities - End-of-trip facilities are designated places that support bicyclists, joggers and walkers in using alternative ways to travel to work rather than driving or taking public transport. End-of-trip facilities include, but are not limited to: bicycle parking, showers, lockers, and changing rooms.

Federal Highway Administration – See FHWA.

FHWA – Acronym for Federal Highway Administration, a division of the federal United States Department of Transportation that specializes in highway transportation, which also publishes design and standards manuals in conjunction with other transportation standards groups and government agencies.

GIS – Acronym for geographic information system. For more info, see ArcGIS.

Gutter – A depressed area between the curb or sidewalk and the roadway that collects water from the roadway and surrounding structures and diverts it into a storm drain.

Institute of Transportation Engineers – See ITE.

Intersection – A place where two or more roads meet. Intersections are generally the areas of the roadway where most congestion and collisions occur.

Inverted U Style Bicycle Rack - A type of bicycle rack that resembles an inverted U. This style of rack is currently located at the CBEIS building.

ITE – Acronym for Institute of Transportation Engineers, an international organization of transportation professionals founded in 1930. ITE also functions as a standards development organization,

partnering with local, national, and international entities in an effort to standardize transportation engineering and planning.

LAB – Acronym for League of American Bicyclists, an advocacy and educational organization based in the United States and founded in 1880.

League of American Bicyclists – See LAB.

Manual on Uniform Traffic Control Devices – See MUTCD.

Multi Use Path - A multi use path serves as part of a transportation circulation system and supports multiple recreation opportunities, such as walking, bicycling, and inline skating. A shared-use path typically has a surface that is asphalt, concrete, or firmly packed crushed aggregate.

MUTCD – Acronym for Manual on Uniform Traffic Control Devices, a manual published by FHWA and USDOT to specify standards for signs, road surface markings, and signals are designed and used in the United States.

NACTO – Acronym for National Association of City Transportation Officials, a forward thinking group of transportation planners and engineers, urban designers, and advocates, which produced the Urban Bikeway Design Guide, which is used by many DOTs and consultants (mostly in the United States) to create new, safer, and more innovative bikeway designs.

National Association of City Transportation Officials – See NACTO.

Non-signalized intersection – An intersection without any form of signalized. Example: an uncontrolled intersection or an intersection controlled by stop or yield signs.

Parking lane – The lane on a roadway for parking motorized vehicles. Restrictions on time and duration of parking may be applied to vehicles in certain parking lanes.

Peak hour – Also known as rush hour. Occurs twice a day (and three times in some cases, where a lunch hour rush creates more traffic than normal), normally between 6 and 10 am, and 4 and 7 pm.

Pedestrian – A person traveling on foot. Sidewalks and crosswalks are designed primarily for use by pedestrians, though their use is not restricted to these users and may accommodate bicyclists, Segway riders, scooter rider, and other small vehicles. In Utah, there are few places where sidewalks are only permitted to be used by pedestrians (areas with high foot traffic).

Pullout – An area of the roadway designed for buses to exit the flow of traffic, make a stop and drop off or pick up passengers, and then reenter the roadway, allowing other vehicles to continue uninhibited.

Right of way – See ROW.

Rounded Wave Bicycle Parking - The style of bicycle parking has a serpentine shape that creates a series of U shaped slots for bikes to be parked in. These racks are generally not recommended due to poor spacing, the round tubing being susceptible to cutting, and the design only allows for the frame and one wheel to be locked to the rack.

ROW – Acronym for right of way, the general principle establishing who has the right to go first at a conflicting part of the road.

Runnel - a narrow ledge along the side which allows you to push your bike up or down the staircase.

Shared lane marking – See SLM.

Sharrow – synonym for shared lane marking (see SLM).

Signalized intersection – An intersection with some form of signalization. Example: an intersection with flashing red stop lights or traffic signals, which direct traffic automatically according to set times that give ROW to some users while restricting the flow of other users.

SLM – Acronym for shared lane marking. SLMs, or “sharrows,” are road markings used to indicate a shared lane environment for bicycles and automobiles. SLM markings reinforce that a bicyclists may use the full lane, guide bicyclists where to ride on the street, and can be used to offer directional and wayfinding guidance.

Slurry seal – A method of roadway pavement resurfacing common on roads in Salt Lake City. Slurry seal is used as an intermediate fix between asphalt or concrete reconstruction projects in order to lengthen the life of the roadway surface.

Stop bar – A white roadway surface line marking (usually 8-12” wide) on the near side of a controlled intersection (signalized or otherwise) that indicates to vehicle drivers where they should stop. The stop bar is almost always before the pedestrian crosswalk and may be placed even further back in the case of a bike box.

Striping – Synonym for linear road surface marking, which is used on a road surface in various widths in order to delineate between traffic lanes, direction of traffic flow or hazards in the roadway.

Through bike lane – A bike lane that is continuous, even at intersections. A bike lane is considered a through bike lane even when the bike lane striping does not appear in the physical area of the intersection. The bike lane then resumes on the far side of the intersection.

Through travel lane – A travel lane that is continuous, even at intersections.

Travel lane – A lane in the roadway, within which most vehicles may travel. Restricted travel lanes (like bus-only lanes) may be dedicated to one travel mode.

Turn lane - A lane in the roadway design primarily for turning vehicles and which are usually located at intersections.

Wave-Style Bicycle Rack - See Rounded Wave Bicycle Parking.