In the fall of 2013, Community Design Solutions conducted a thorough analysis of current conditions for bicyclists in and around the University of Wisconsin-Milwaukee main campus. Bike rack types and locations, trails, paths, and routes within and to the campus area, issues of safety and security, storage, infrastructure, and avenues for obtaining bikes were some of the issues that were analyzed by CDS staff.

This study was done within the larger context of the UWM Comprehensive Bike Plan. This preexisting study laid out goals for establishing UW-Milwaukee as a bicycle friendly campus. The role of this new study is to provide tangible proposals that can be implemented in pursuit of the Comprehensive Plan goals.

CDS proposes a number of guidelines for construction and implementation of bicycle infrastructure, including but not limited to: routes to campus, bike paths within campus, shared bicycle/pedestrian corridors, sheltered bike storage facilities, repair stations and facilities, location of BikeShare hubs.
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## Appendix
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Existing Plans_UW Milwaukee

There are currently a number of proposed and in-progress construction projects on the UW-Milwaukee campus. The majority of these proposals include sustainable design as the backbone of their vision. One key desire is to increase student bicycle ridership from 4-7% and staff ridership from 6-9%. It is the hope of CDS that the proposals laid out in this report may guide proposed and current projects on campus. UWM was recognized as a Bronze Level Bicycle Friendly Campus by the League of American Bicyclists in the Fall of 2013.

1. Kenwood Interdisciplinary Research Complex
2. New Union Proposal_Workshop Architects
3. Campus Master Plan_Aerial
Precedent Analysis_Campus Bicycle Design

A number of college campuses across the nation are providing innovative and practical facilities and infrastructure for bicyclists. The following pages highlight institutions which stand out as exemplars of campus bike design. It is our hope that UWM emulate some of these highlighted programs to enhance bicycling infrastructure and culture on campus.

UNIVERSITY OF CALIFORNIA, DAVIS

Students: 32,000
Bike rate: 39%

ASUCD Bike Barn + Garage

Barn is a full service, student run, bike repair shop. It offers regular maintenance classes.

Garage is a self-service bike repair facility.

“Aggie Bike Buy” is an Online service directed at incoming students where they can purchase low maintenance bikes that will be ready when they arrive on campus.

Summer bike storage available.

CDS recommends fostering the existing Outdoor Pursuits Center(bike rental) on campus and developing a visible bike shop in the proposed new union.
UNIVERSITY OF COLORADO, BOULDER

Students: 30,000  
Bike rate: 10%

Two campus “Bike Stations” are operated by Parking & Transportation Services and the Environmental Center.

Bike Stations rent cruiser bikes, called “Buff Bikes,” (free for two days, $30 per semester) to students.

Students pay $10 to register their bikes. The fee helps pay for campus bike facilities and services. Registered bikes receive free bicycle repairs from student technicians and discounted replacement parts.

CDS recommends installing several BikeShare stations on the campus to provide students access to reliable, cost effective transportation when needed.

PORTLAND STATE UNIVERSITY

Students: 29,700  
Bike rate: 12%

Multiple on campus, indoor bike storage facilities available for $15 quarterly that can be accessed by swipe card.

Campus offers incentives for biking and holds regular team commuting competitions.

Campus Bike Hub charges members $30 per year and offers classes, events, and access to repair facility and staff. 1,500 members as of 2010.

2011 Bike Plan incorporates detailed bike route and parking usage statistics.

CDS recommends the development of indoor bike parking facilities in current parking structures and in future construction (new union).
UNIVERSITY OF MINNESOTA, TWIN CITIES

Students: 51,900
Bike rate: 10%

The UM campus incorporates a mix of through-campus bike lanes and “walk your bike areas.”

Campus Bike Center offers classes, repair, and trip planning services.

Zap program gives students tags that record each time they ride routes into campus. Logged rides are awarded prizes and other benefits.

Nice Ride bike sharing service is available for a $50 annual membership.

CDS recommends the creation of dedicated bike lanes through and to the campus area to promote a safe and visible bicycling culture.
Proposed Improvements

The suggestions that are laid out within this report have the intent of increasing bicycle ridership from 4% to 7% and staff ridership from 6% to 9%, per the goals laid forth by the UWM Campus Master Plan.

Pages 9-12 address a wide range of issues that inhibit cyclists coming to and moving within the UW-Milwaukee campus. The remainder of this section details a number of interventions with the goal to get cyclists safely to a number of proposed “Bicycle Hubs.”

Provide adequate and functional racks for locking bikes

Assist students in finding safe routes to campus

Create safe routes on campus [on streets and within quads]

Provide sheltered parking for bicycles at key “hubs”

Promote bicycle awareness on campus

Foster current campus bike facilities for repair, sales and education

Move 20 of the existing bike lockers [10 to each hub]

Encourage year-round cycling

Implement Milwaukee Bike Share on campus
The UWM Campus Master Plan’s goal of increasing student ridership from 4% to 7% and staff ridership from 6% to 9% requires a near doubling of existing bicycle parking facilities at UWM. Current bicycle parking facilities can only accommodate about 4% of UWM students and staff. Using 2012-13 enrollment and employment figures (29,145 students, 3,712 staff), 7% student ridership would require bicycle rack capacity of 2,040, and 9% staff ridership would require a capacity of 334, for a total requirement of roughly 2,300 bicycle parking spaces needed.

Please refer to Appendix B (pg. 34) and Appendix C (pg. 38) for complete rack analysis and locations.

<table>
<thead>
<tr>
<th>Rack Type</th>
<th>Capacity Est.</th>
<th>NW Quad</th>
<th>SW Quad</th>
<th>NE Quad</th>
<th>SE Quad</th>
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<td>Comb</td>
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<td>Inverted U</td>
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<tr>
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Critical Mass_Prague 2007
Short-Term vs. Long Term Bicycle Parking

There are two types of bike parking facilities: short-term and long-term. Short-term parking is for cyclists parking for less than two hours. It may consist of a simple, uncovered bike rack situated near a major entrance to a building. Long-term parking is for cyclists parking for more than two hours at a time. Long-term parking is often covered and highly secure, whether by means of individual lockers, shared bike rooms, or video surveillance.

Short-term facilities make up the majority of bike parking, and should be widely and evenly distributed. Long-term facilities can be located at key locations so as to serve the greatest number of users.

Both types of parking are needed to meet the needs of all cyclists. If cyclists running quick errands cannot access convenient short-term parking near their destination, they are likely to lock their bikes to any object in sight, such as trees, poles, or railings. Similarly, people who remain at school the entire day may be deterred from riding their bikes if they are unable to find secure, weather-protected parking on campus.
Improve Bicycle Parking

RACK TYPES
Ideally all bike racks on campus would be of the Inverted U (N) variety, as a single rack design allows users to become familiar with proper locking techniques without having to adapt them to each different rack type. When appropriate, non-preferred rack types should be phased out and replaced by preferred racks.

CAMPUS BRANDING
Improved bicycle parking can also support campus branding efforts. Branded inverted-U racks, like the one pictured at right, could be placed at prominent bike parking locations.

LONG-TERM PARKING
The CycleSafe Bike Lockers (S) are ideal long-term storage solutions. However, they are currently being used at half capacity. UWM Housing might consider extending locker rental to all UWM students and staff in order to use these lockers to their full capacity. Perhaps several of these lockers could be moved to the proposed bicycle parking hubs in the Southwest and Southeast Quads.

RACK INSTALLATION GUIDELINES
Racks should be installed so as to maximize the number of bicycles that can lock to them. When situated near a building or wall, racks should be installed perpendicular to the surface so that both sides are accessible. Also, racks should be properly secured to a rigid surface in a manner that inhibits theft and tampering.

* Please refer to Appendix B (pg. 34) and Appendix C (pg. 38) for complete rack analysis and locations.
Improve Existing Covered Parking

Many UWM buildings feature deep overhangs that would be perfect for covered bicycle parking. These areas are often located near entrances and within view of building occupants, making them highly secure short- or long-term bike parking locations. However, only some of these locations feature bike racks, and many of the racks are poorly designed or installed. Replacing the existing variety of racks would be an aesthetic improvement and show the university’s commitment to improving bicycle infrastructure. Additionally, installing new racks at locations that currently have none would be a relatively low-cost way of providing covered bike parking.

The map below identifies locations with deep overhangs that could accommodate bike parking. The following pages illustrate three proposed rack improvements that would elevate these areas from leftover, underutilized space, to premium covered bike parking.
Improve Existing Covered Parking_Lapham Northeast Entrance

This location at the northeast entrance to Lapham could be transformed into premium covered bike parking by replacing the existing unbolted racks with a single style of inverted-U racks in either of the suggested configurations below. This area could provide covered parking for 12 to 16 bikes, and uncovered parking for four to six more. Adding a curb cut at the north end of the sidewalk would facilitate easier access for bicyclists entering from Maryland Ave. The area can currently only hold 8-10 bikes total.

Existing 8-10 spaces
Proposed 16-22 spaces
Improve Existing Covered Parking_Lubar North Entrance

This location at the north entrance of Lubar features a jumble of rack types that are improperly placed, resulting in a messy look and underutilization. Replacing these racks with inverted-U type racks would improve the appearance of this parking location and result in more usable rack space for 12 to 20 bikes. The current single rack can only hold 3-4 bikes.
Improve Existing Covered Parking_Lubar Corner Colonnade

This location on the east side of Lubar features a protected colonnade that does not fall in the path of pedestrian traffic. New inverted-U style racks bolted into the pavement would create an attractive covered parking location for 12 to 14 bikes. The current racks provide can only hold 8-10 bikes.
Ensure Bike Parking Areas are Plowed

In an effort to promote year-round bicycling among UWM students and staff, the University should ensure that adequate bike parking facilities are accessible and kept clear of snow during the winter months.

Too often bike parking areas are turned into snow dumping areas in the winter, making bike racks inaccessible and frustrating winter riders. Policies should be established with UWM Grounds Services to ensure that bike racks remain clear of snow.

Plowed-in bike rack at Architecture and Urban Planning Building
Indoor Bike Parking in Campus Parking Garages

Existing parking garages present a ready-made solution for covered bike parking on campus. At least 10 bicycles can be parked in the same space as a single automobile. Converting just a few car parking spaces to bike parking would be a cost-effective, visible solution that would provide enhanced weather protection and security for bike commuters. The prominence of bike parking in garages may also increase visibility of biking among drivers and help convince drivers to make the switch to bike commuting.

Many progressive municipalities are already mandating that new parking garage construction include indoor bike parking (see “City of Cincinnati: Bicycle Parking in Garages”). UWM could easily retrofit its existing parking garages to accommodate limited bike parking and position itself as a leader in bicycle infrastructure planning.

Bike parking in garages would be a long-term parking solution targeting university employees and certain students who park their bikes for long periods during the day. It would also provide winter commuters with covered, semi-heated parking to allow their bikes to thaw and avoid the dreaded ice-over from winter storms.

Signs at garage entrances would announce that free bike parking is available in the garage. Bike parking could be placed near building entrances from the garage, giving bike commuters “preferred” status and announcing to all users of the garage that bikes are being promoted on campus. A bank of lockers could also be placed nearby to give commuters a place to store helmets and gear.
Bicycle Routes to UWM_Existing

Current bike lanes, designated routes, and off-street paved trails provide a variety of viable bicycle routes to campus from all directions. UWM bike commuters would benefit from improved roadway conditions and additional bike lanes that stitch together this patchwork of routes.
Bicycle Routes to UWM_Proposed Improvements

UWM should advocate at both the city and the county level for the following proposals to improve bicycle routes to campus:

- Improve road surface conditions on Maryland Ave.
- Extend Oakland Ave. bike lanes to Capitol Dr.
- Install traffic-calming elements on East and West ends of Locust St Bridge to improve safety conditions and turning ability of cyclists.
- Convert the outside lane of Locust St Bridge to a bollard-separated bicycle lane.
- Create additional Oak Leaf Trail off ramp at Kenwood Blvd that allows bikers traveling to UWM from the south to avoid crossing Locust St.
- Install signs at Oak Leaf Trail off ramps that identify cross streets and nearby destinations.
Campus Map_Proposed Improvements

- Marked Intra-Campus Bike Lane
- Shared Lane
- On-street Bike Lane
- Bike Hub
- Community Depot
- Bike Share
- Proposed Intervention
The following list of interventions that occur on pages 22-42 are strategies that could be implemented within the existing campus fabric. These suggestions culminate with the construction of sheltered bike parking or "Bike Hubs". All of these interventions are intended to making bicycling on campus a safer and more enjoyable experience.

All maps are diagramatic in nature and are intended to clearly convey the proposed intervention. It is understood that all proposals would meet ADA standards as well as all local construction codes.
Raised intersections encourage motorists to travel at slow speeds and yield to crossing bikes and pedestrians. Bike markings in the intersection define the path for bikers traveling within the Maryland Avenue bike lanes as they cross the intersection.
Raised intersection at Hartford Ave and Maryland Ave

ADA detectible warning strips at curb cut
Raised mid-block crosswalks slow traffic speeds to better facilitate pedestrian and bike crossings. These crossings can also include bike lanes to improve bike and pedestrian interaction.
Raised midblock crossing on Hartford Ave
3_Replace Pedestrian Overpass on Maryland Avenue with Midblock Crosswalk

UWM’s pedestrian overpass at Maryland Avenue sends a message that automobile efficiency is more important than pedestrian access and safety. While some pedestrians use this bridge, many do not, instead choosing to cross at grade without the protection of a crosswalk. Implementing at-grade crossings would be more economically efficient than maintaining the bridge and it would display UWM’s dedication to pedestrian mobility and safety.

“The common problem (with sky bridges) is that by allowing pedestrians to bypass the streets, motorists become less cautious, the streets below become more dangerous.”

- Kathleen Hill PhD, University of Utah

Raised midblock crossing on Maryland Ave
Raised midblock crossing on Maryland Ave
In addition to the bike lanes on Maryland Avenue, bike boxes could be added to both the south intersection with Kenwood Boulevard. Bike boxes allow cyclists to “jump the queue” of waiting automobiles at red lights, giving them greater visibility to drivers turning right and better positioning for making left turns.
Bike boxes at Maryland Ave and Kenwood Ave

WAIT HERE

2013 UW-Milwaukee Bike Study
Community Design Solutions
Painted Bike Lanes on Maryland Avenue

As the road is resurfaced, colored bike lanes could be added to the east and west side of Maryland Avenue. Color is used on the road surface to enhance lane visibility. In addition, lane striping is used at intersection crossings to further define cycle territory. Bike lanes promote bicycle safety by making bikes more visible to motorists and encouraging timid riders to get on their bikes.
Painted bike lanes on Maryland Ave
Marked Bike Lanes on Select Campus Pathways

Intra-campus bike lanes connect bike hubs, advertise bike use, direct bikes on preferred paths, and provide an area for bike users to safely maneuver around pedestrians.

Lanes should be 4-5 feet in width.

White paint is preferred for its easy application and more temporary nature.

On-road markings should advertise bicycle use and signal the termination of cycle paths.
Marked bike lanes on pathway south of Sandburg dorms
Shared Lane Marking on E Hartford Avenue

Shared lane markings (also referred to as “sharrows”) are special markings placed in the center of the traffic lane to indicate that cyclists may utilize the entire lane. They are implemented because a high percentage of cycling accidents occur when riders are pushed to the edge of the road. Sharrows encourage cyclists to be more visible to drivers (subsequently improving safety) and they advertise biking to potential riders.

Sharrows are inexpensive because they require only white paint and are applicable in situations where the width of the right-of-way does not allow for separated bike lanes.

As noted on page 18, Hartford Ave is a prominent bicycle route that is utilized by many riders who exit off of the Oak Leaf Trail at either Locust or Providence Ave.
Shared lane markings on Hartford Ave.
Construct Intra-Campus Bike Hubs

Bike Hub locations spread evenly across campus and within or near existing activity nodes. They support the functions of a UWM Bike Depot and act as a premium long-term bicycle parking destination.

Hubs include:
- Tire Pumps
- Repair Tools
- Ample Bike Racks
- Covered Bike Parking

move 10 underutilized bike lockers from Sandburg to each bike Hub

Occasional events and incentive programs provided to bicycle commuters to promote hub use (i.e. free coffee, bike lights, etc.)
The first possible bike hub location, located near the southwest entrance to the Architecture and Urban Planning Building, takes advantage of a major east-west campus pedestrian axis. The site can accommodate eight bike hub modules linked together in two groups of four, creating an access path through the center and providing covered parking for up to 46 bikes, one pump, and repair station. A portion of the existing prairie grass should be replaced with new concrete pavers to match the existing sidewalk grid.
Bike Hub Location 2_Engineering and Mathematical Sciences Building

The second proposed bike hub location is positioned along the south wall of the Engineering and Mathematical Sciences Building, tucked into the space of the colonnade. These five freestanding bike hub modules can accommodate 28 bikes, pump, and repair station.
Bike Hub Location 3_Sandburg

Designed and partially fabricated, this proposed bike parking concept was produced by a group of SARUP students under the direction of Greg Thompson. Utilizing an unconventional form, their shelter was designed for the Sandburg patio and intended to efficiently store student bicycles. We recommend soliciting student work for future bike hub designs.
Position Midwest BikeShare Stations

Sited on City of Milwaukee property, three BikeShare station locations are proposed for their proximity to potential users and their public visibility.

Bike Shares are facilities that allow short-term rental of bicycles. They allow users to take advantage of bicycle transportation for short distance travel, without having to own a bicycle.
Include UWM Community Bike Depot in Plans for New Student Union

Modeled on precedents such as the UC Davis Bike Barn and Portland State Bike Hub, we propose that UWM dedicate a prominent space in the new student center to a UWM Community Bike Depot. This new space would include a bicycle repair shop offering assisted and/or do-it-yourself repairs and classes on bicycle repair and safety. Most importantly, it would give a face to UWM's mission to promote environmentally sustainable transportation alternatives.
It is the intent of this report to encourage and facilitate an increase in bicycle ridership for the students and faculty at UWM. These interventions work best when all are employed, though any implementation will be beneficial. Through the implementation of these proposals, the University of Wisconsin Milwaukee can move forward in exhibiting themselves as a progressive, bike friendly campus.
Appendix A
Existing Resources_Bicycling Amenities
Existing Resources_Bicycling Distance/Time Map

- Silver Spring shopping & Bayshore Mall (Trader Joe’s, Sendik’s)
- Capitol Drive shopping (Walmart, Outpost)
- Shorewood Shopping District (Sendik’s, Pick n’ Save)
- Oak Leaf Bike Trail
- Downtown
  - Brady Street (Metro Market)
  - North Avenue (Pick n’ Save, Whole Foods)
- UWM
- Third Ward
- Lakefront Parks

Distances:
- 2 miles
- 4 miles
- 15 minutes
- 30 minutes
Appendix B
Bike Rack Analysis_Existing Conditions

When it comes to providing secure and easy bicycle parking, not all racks are created equal. To analyze current bicycle parking facilities on campus, all existing bike racks were cataloged based on style and estimated capacity. UWM currently features an ad hoc assortment of rack types, many of which fail to provide easy and secure locking of the bicycle frame and both wheels. These factors can deter riders and enable theft.

The Inverted U-type (N) stands out as the preferred rack design, as it supports bikes at two points and enables easy locking of the frame and both wheels. The Post and Ring (R) and Undulating varieties (L, P, Q, U) are also acceptable. All other rack types fail in enough ways that they should be avoided as future bike rack purchases and replaced with preferred designs as budgets allow.

A
Comb_Large
112” x 32”
6-7 capacity

- Slots too close together
- Small diameter bars easily cut
- Difficult to lock rear wheel
- Larger diameter wheels don’t fit into slots
- Encourages users to lock bikes sideways, reducing efficiency

B
Comb_Square
80” x 23”
5-6 capacity

- Slots too close together
- Difficult to lock rear wheel
- Larger diameter wheels don’t fit into slots
- Encourages users to lock bikes sideways, reducing efficiency

C
Comb_Short
61” x 36”
4-5 capacity

- Slots too close together
- Small diameter bars easily cut
- Difficult to lock rear wheel
- Larger diameter wheels don’t fit into slots
- Encourages users to lock bikes sideways, reducing efficiency

H
Coat Hanger
74” x 28”
6-7 capacity

- Bars too close together
- Small diameter bars easily cut
- Difficult to secure rear wheel
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<th>Rack Type</th>
<th>Dimensions</th>
<th>Capacity</th>
<th>Notes</th>
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<td>Undulating_Stretch</td>
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<td>Post + Ring_Modified</td>
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<td>2</td>
<td>Acceptable rack design, Small diameter rod easily cut by thief, Small ring openings make locking difficult, Rack only supports bike at one point; bikes can tip easily</td>
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</tbody>
</table>
CycleSafe Bike Lockers
2 capacity

- Preferred long-term storage solution
- Only accessible by single user

Comb_Other
9 capacity
Movable

- Small diameter bars easily cut
- Difficult to lock rear wheel
- Larger diameter wheels don’t fit into slots

Undulating_Small
62” x 7”
4-5 capacity
Bolted

- Narrow spacing decreases advertised capacity
- Rack only supports bike at one point; bikes can tip easily
- Encourages users to lock bikes sideways, reducing efficiency

Coat Hanger_Alternating
7, 11 capacity
11 bolted, 7 movable

- Double-sided access increases capacity
- Small diameter bars easily cut
- Difficult to lock rear wheel
Improper Bike Rack Installation

Bolts not tamper-proof
Racks too close together, not accessible from both sides
Accessing racks requires climbing stairs

Racks not near building entrance
Rack not on paved surface
Rack not bolted to pavement
Appendix C_Bicycle Racks and Facilities

Bicycle Racks and Facilities_NW Quad

A walking tour of campus was conducted to identify all existing bicycle rack types and locations. These parking facilities, along with other bicycle-related facilities such as public showers and repair stations, are presented in the following Quad maps. Red callouts identify instances where bicycle parking is improperly installed or underutilized.
Bicycle Racks and Facilities_SW Quad
Bicycle Racks and Facilities_SE Quad
Appendix D_Additional Resources

The following resources proved helpful in the creation of this report and should be consulted for further explanation of the proposals presented.

