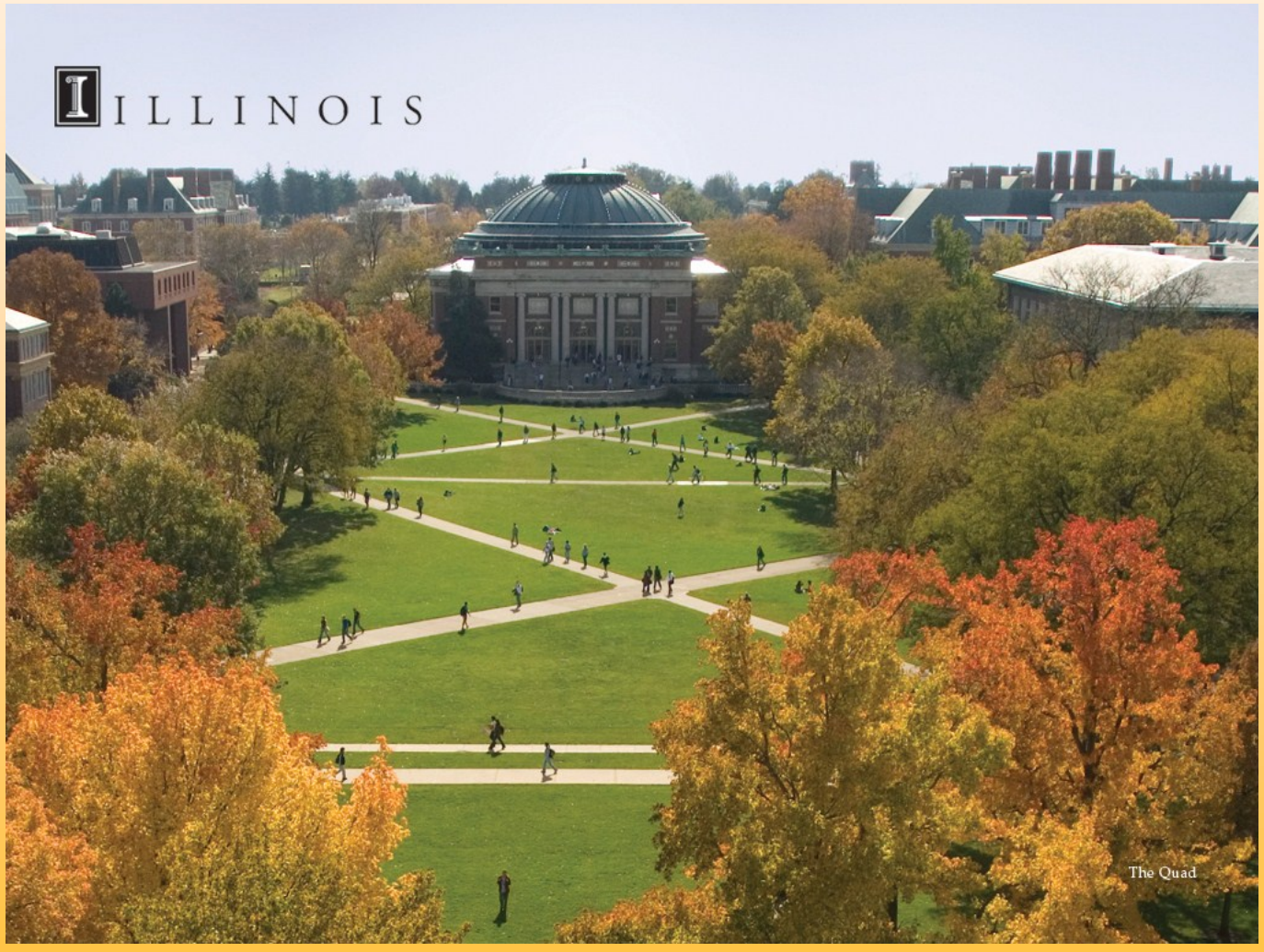
Departmental Bike Sharing Manual: How To Start a Bike Sharing Program



By ENG 315 Grab-A-Bike, Fall 2011

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What are the Benefits of Bike Sharing Program?

Health

According to the Illinois Cross Campus Bicycle Project report conducted by Wojtek Jan Chodzko-Zajko, Head of Kinesiology, most of the faculty of the Kinesiology and Community Health departments chose to use their personal motor vehicles to navigate campus than to use the bus system or to walk (Final Report, 2009). By implementing a bike sharing system, faculty of the departments could impact both their personal health and the health of the community. Biking across campus in place of using a motorized vehicle helps add extra aerobic exercise to a person's day, which has positive impacts on their weight and cardiovascular health. Also having more bikers on campus than drivers would lower the carbon footprint in Champaign-Urbana.

Cost

Parking- Traveling by bike is seen as the most efficient way to navigate campus. By using a bike there is no need to pay for parking when travelling to some other part of campus, which can cost individuals hundreds of dollars per semester.

Fuel - Implementing a Bike Sharing System would allow for faculty and staff to save on the costs of fuel purchase. The average cost of premium gas in Champaign in the month of October 2011 was estimated to be $3.566 per gallon (illinois.gov/gasprices/search.cfm). Therefore, by using a bike to navigate campus instead of a motorized vehicles, the faculty and staff would be able to save a sizable amount of money.

Time

Biking is one of the quickest ways to travel across campus because of the traffic and the abundance of one-way streets. If an employee was to use a bike to travel around campus instead of driving, time spent paying an employee for their time spent traveling could be minimized and the efficiency of the department could be increased.

How This Document Works:

In an effort to ease the process of getting information from this document, it has been filled with clickable links. Any text that is formatted like this can be clicked on to take you to more information regarding that topic. It may take you somewhere within the document itself or take you to a webpage. Also, you may click on any line in the table of contents and you will automatically jump to that Section. In addition to that every page has a blue TOC down in the corner. If you click on this then you jump back to the Table of Contents.

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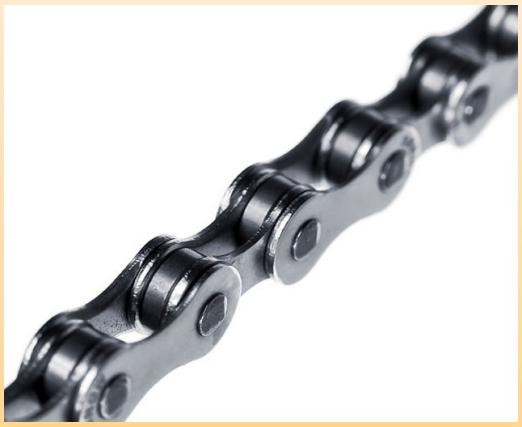
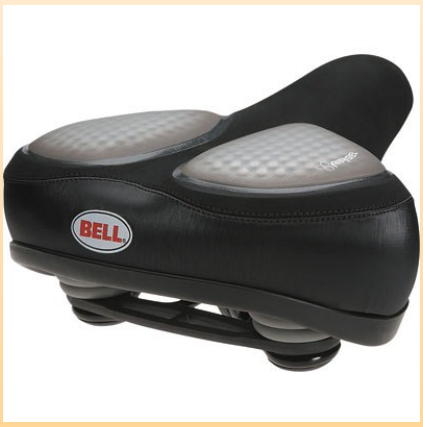
Quick-Fix Reference Guide

If you are having trouble with any of the following items, click on the names or pictures to jump to information regarding fixing them.

Bike Chain



Bike Seat



Bike Seat

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Preparing for Your Department's Bike Sharing Program

Conduct a Feasibility Study

Departmental Survey to measure department employee' interests in usage of the bike sharing program

Mock Survey – Appendix (Not Attached in this draft document)

Identifying a person who will be able to manage the program, e.g. a building secretary. (Source)

Get Funding

Departmental bike sharing should be funded as departmental expenses. Unfortunately, University of Illinois board cannot subsidize departmental bike sharing programs.

Additional funding may be available through:

UI Sustainability Project (link)

Student Sustainability Committee (link)

Optional: Implement a Pilot Program.

Obtain a small number of (1~3) bikes first and implement the sharing system as outlined after this step

Bikes used in this program does not have to be of a high quality since the program may not prove to attract much attention from departmental employees

Measure departmental employees' interest level in the bikes

How much time are each bikes rented by each individual?

What % during the day is the bike checked out for?

Hardware; What you need to start

Unlike requirements for typical personal city bikes, a shared bike with faculty members as a user would require the following considerations:

Easy to ride and get on and off from the bikes when dressed in business attire.

Should fit both males and females comfortably with one-size-fits-all bike frame

An upright riding position is preferred over a low riding position since faculty usually wear professional attire which can make riding in difficult.

Easy to be operate with smaller number of gears (single to 3-speed) and fewer shifting mechanisms

Some storage compartment like a basket or a rear rack, so as to allow faculty to carry their books, laptops and other belongings with them.

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Guidelines on bike selection:

Brakes

Must have front and rear brakes, for safety reasons

Bike frame

Geometry

Allows comfortable step-through with upright riding position for individuals in business attire

Weight

Lightweight bikes make a big difference - lighter bikes require less effort to operate

Material

Aluminum Alloy frames are preferred over Steel

Seat

Comfortable seat with possibly a seat post shock to maximize comfort

High quality components: Quality of components directly correlate with its durability

Gears are choice- single speed bikes are cheaper, and easier to maintain

Although Illinois is relatively flat, having the option of using gears helps when traversing changes in the landscape

Also very helpful when riding against wind

Components equivalent to or exceeding the component manufacturer Shimano's Alivio product lineup should be used on the bicycle

Some cruiser bikes will have gears integrated into the rear hub. It requires less maintenance, but has fewer number of gears than external gear system

Storage Accommodation

Bikes with pre-installed storage such as a front basket or rear carrier are preferred due to reduced extra cost on installation and hardware

If not, they must have provision to accommodate aftermarket fenders and storage compartments (baskets)

Warranty

Most bike manufactures offer 5 years to lifetime warranty on their frame for the original owner

Rest of the components like shifters, derailleur, wheels are usually covered by the warranty for 1 – 2 years

Maintenance on the bike should be easy and economical.

Bikes have standardized, non-special parts those can be serviced by the servicing facilities around campus

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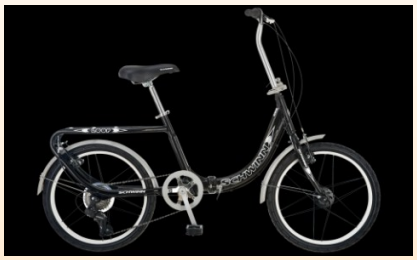
Suggested Bikes

Considering above requirements, reputable bicycle brands with comfort bike lineup under the MSRP of $350 were screened. The list of bicycle brands was then narrowed by its local availability.

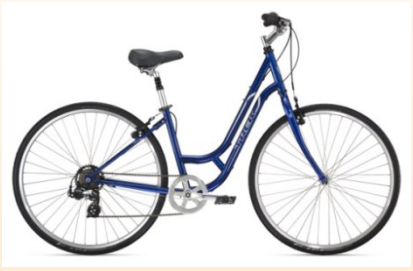
Following bicycle brands were found to be available with bike dealers in Champaign-Urbana:
Trek, Specialized, KHS, Giant, and Schwinn

Schwinn Loop (#1)



KHS TC-100 (#2)

Trek 700 WSD (#3)



Bike #	1	2	3
Brand	Schwinn	KHS	Trek
Bike Model	Loop	TC-100	700 WSD
Bike Type	Folding	Cruiser	Hybrid
Riding Position	Relaxed, Stepthru,	Relaxed	Relaxed, Stepthru
Gears Available	7, external	21, external	21, external
Weight			
Component Quality	3/5 Stars	3/5 Stars	4/5 Stars
Brand Reputation	3/5 Stars	4/5 Stars	4.5/5 Stars
Warranty	2yr components, 5yr frame	2yr components, 5yr frame	2yr on all components, life-
Available Color	Black, Silver	Silver, Grey, Black	Navy Blue
Local Availability	Durst	Champaign Bike	Dust & Champaign Bike
Price (MSRP)	$220	$329.99	$359.99
Brand Website	Schwinn	KHS	Trek
Weight	Light	Medium-Heavy	Medium

The number of bikes needed for the program will vary depending on the number of faculty members that are going to use the program. In the case of the Kinesiology Department, there is a direct relationship between the number of bikes available to the number of total eligible employees

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Miscellaneous Needed Items

Bike Lights:

Bike lights are a legal obligation for riding when dark under the Champaign County traffic law.

Lights mounted on bicycles will greatly increase visibility of the bicycle rider and decrease chance of bike traffic accidents with pedestrians and automobiles when dark.

Installation

Bikes do not usually have pre-installed lights

Battery-powered LED front and back lights can be installed at the Campus Bike Project at a subsidized cost of $10. (Planet Bike's Blinky Safety Light)

Replacement batteries are also available at the Campus Bike Project for $1 each.

Helmet:

Helmets are not only a safety precaution; they are also a legal requirement while biking in Illinois.

Helmets offer the rider protection in case of a mishap and are a small investment compared to the protection they offer.

Purchasing Helmets

One-size-fits-all helmets with adjustment straps are available

Helmet test certifications to consider:

CPSC or Snell B90 certified helmets offer proven protection. (Website to purchase helmets at a competitive price)
Snell B95 certification entails more rigorous tests and are more desirable (Informative helmet website)

Cost is typically around $30+ and most bike shops offer helmets

Hygiene Concerns

Disinfectant and scent removing sprays as offered by brands such as Lysol can be bought from a local departmental store for around $5.

Before use, check with the helmet manufacturer that the disinfectant will not damage the helmet's crashworthiness

This can be sprayed on the helmet after every use and should alleviate any hygiene concerns.

Bike Locks

Every bike must be locked no matter where it is parked. Considering that bikes will be left unattended, a secure lock is important to ensure prevention of bike theft.

Several different companies offer varying types of locks.

Some locks are easier to break than others and are more prone to be broken into.

Considering the history of bike thefts on campus, it is preferred that a superior lock is bought for the bikes. This is a one-time investment that will protect the more expensive bikes in the years to come. Below are a few of the common types of locks available and the companies that offer them.

Combination locks

The least secure against lock picking

Bypassing of the bike sharing logging system may occur since the combination would not be changed after every use.

U-Locks & Chain Locks

Usually made of a very strong alloy steel and are designed to prevent theft of bikes.

U-Locks or Chain locks from a reputable company such as Kryptonite would be the ideal choice. (Reccomended U-Locks)
Kryptonite's Evolution series 4 is suggested for bike sharing-- which can be purchased from one of the bike dealers (Link) around Campus.

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Fender:

Since Illinois weather sees a lot of rain, riding in wet conditions can result in the front and rear tires flinging up dirt onto the bike frame as well as the rider. Fenders will also make the overall cleanliness of the bike last longer.

- Most bicycles do not have pre-installed fenders
- Available for installation by most bike retailers at an additional price.
- There are mainly different types of fenders, but it is suggested that C-shape metal fenders, since metal fenders are sturdier than plastic frames, and a full half-circle shape will prevent the rider from getting any dirt on him/her.

Bike Map:

Facilities and Services maintains a bike map detailing parts of the campus and surrounding areas and the locations which have bike paths and bike lanes.

- Updated copies of these maps can be obtained / requested from Facilities & Services
- These maps can be offered to the riders prior to renting the bike
- A digital copy of this is also available here.

Something else that the department members could use is the 'Bike Route' option on Google Maps which can clearly plan the bike route for the user without referring to the actual bike map.

Bike racks and storage options

All bikes require a secure place to lock the bike onto. It is expected that a departmentally shared bike will spend largest portion of its time parked at the department's designated bike parking location.

- Currently on the U of I campus there exists a number of different types of bike racks that have been installed by F&S over the years, with several more in the process of being installed. This bike parking can be used by departments for their bike sharing program.
- On the issue of storage of bikes during winter, storing the bikes indoors would be the best option available. This is especially true during Illinois winter, where moisture, salt and temperature changes can shorten the life of all bike components.

Facilities and Services hold the responsibility for any building spaces on campus and since indoor bike storage has concerns regarding fire code compliance, F&S should be consulted in all cases of bike storage.

How to Use & Maintain the Program

Procedures for renting out bikes:

Whoever is in charge of overseeing the program (possibly a receptionist) should be contacted when a bike is being checked out. A checkout sheet should then be filled out before taking a bike. A sample bike checkout sheet has been included in the appendix.

When can you check it out / bring it back? How long can you check it out for? Policies for damage

Step-by-Step Procedure

Employee needs to go to their respective department(s)

Go to the building receptionist/caretaker of the bike project.

Tell them you want to check-out bike, and fill in the short check-out form.

Hand over the filled-in check-out form and collect a bike-lock key.

Go to the bike rack and take the bike... Ride where-ever you want to...

Bring back the bike to the department, lock it and give the key back to the receptionist.

If there were any issues with the bike, note them down on the sheet along with the bike number.

Policies for liability- Bike Accidents:

Different Types of Bike Accidents Include:

Bodily Injury to bicycle rider

Causing bodily injury to others

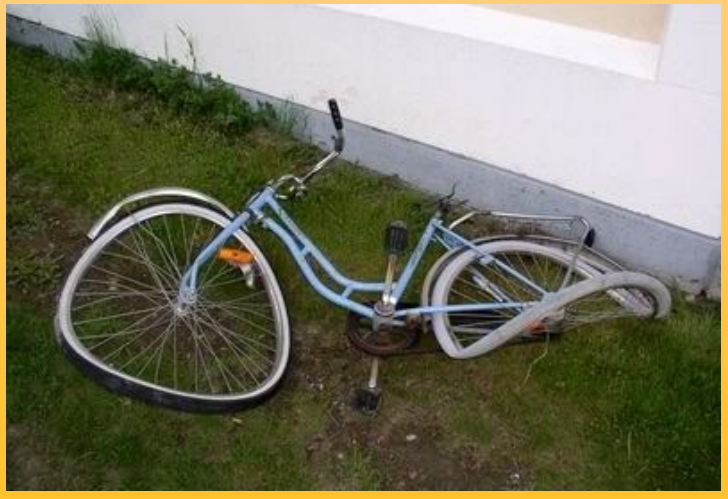
Causing damage to others' properties

Under unfortunate circumstances when a university employee is involved in an accident while on a departmentally shared bicycle on university duty, OBFS's coverage on auto liability insurance applies.

Bicycles are considered to fall under the same clause as operating any university "vehicles"; therefore claims are processed under the clauses set forth under the University's auto liability coverage.

For more detailed information about coverage and claims, please visit:

http://www.obfs.uillinois.edu/risk/auto-liability/



When the program is ready:

A message should be sent to department employees that are eligible to use the program, letting them know about the program.

Departmental E-mail (See Appendix B)

Additional Information may be added to the E-mail regarding any extra information your department has decided on regarding:

Fliers

Departmental Meetings

Things you should know

The number of bikes available

Checkout process

How to lock

How long you can check it out

Damage policies

How to lock the Bikes

Bikes should be locked at its frame and

How to ride your bike

How to check out your bike:

Filling out the log

An informational package for users' knowledge

** The users are responsible for maintaining appropriate tire pressure on these bikes

A Tag should be attached to each of the shared bikes stating:

***Wait! Before you ride, check the following:**

Tire pressure

front and rear brake works well?

Maintaining the bikes

Following items require regular maintenance performed at a certain interval. Please click on the respective bike components below for more detailed information on its maintenance.

User Checklist Before Every Ride

Brakes: Both Front & Rear Brakes working?

Tire Pressure: Are tires firm?

Are both wheels securely fastened onto the bike?

Are reflectors in place?

*This checklist is printed on a plastic card and affixed to handlebar of every shared bicycle. It is going to be difficult to enforce this checklist, but it will improve safety of the bicycle for safety conscious bicycle riders.

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Departmental Maintenance Items

Items	Maintenance Interval (Every X Rides)	Difficulty (1:Easy, 5:Difficult)	Time required per bike
Lube & Clean chain	10 Rides	2/5	5 Min
Adjust Cable Tensions	25 Rides	3/5	10 Min
Clean Bike	25 Rides	1/5	5 Min

**Indication for maintenance needs should not be relied on time interval alone. Condition of bike components must be examined by its user and maintenance caretaker at regular intervals, and serviced as needed. Each bike will see varying degree of usage and conditions; bikes ridden more frequently and exposed to outer elements for longer periods deteriorate more rapidly.

Maintenance Items to be done through Bike Mechanics

	Item	Maintenance Interval	Part Cost	Labor Cost (if done externally)
General Maintenance	Degrease and Lube Chain	20 Rides	$3	$10
	Lube Cables, Levers, Adjust Cables at re-spective components	30 Rides	$0	$10
	Clean & Repack Bottom Bracket, Hubs, Pedal axles	50 Rides	$0	$10
Check Wear & Replace	Brake Shoes	Seasonal (Beginning of Spring and Fall)	$7*	$10*
	Chain (Bulk)		$15*	$15*
	Tires (Kenda Qwest)		$20*	$10*
	Tube		$8*	$10*
	Brake or Shifter Cable with Housing (Bulk)		$5	$10
	Grips		$10 / Set	$8 / Set
	Headset		Variable	
	Reflectors Replace if missing or broken		$5	$5

* Variable = Cost may vary for all parts and labor, but components marked as “variable” will vary significantly from bike to bike .

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Bike Mechanic Suggestions

Bike maintenance has to be performed at a regular interval, and the workmanship has to be reliable; lack of maintenance or inferior workmanship can result in downtime of the shared bikes, and can even lead to serious injuries of bike users.

Bike maintenance for a departmental bike sharing program could be done through three different parties: Campus Bike Project, local bike shops (Durst Fitness & Bikes or Champaign County Bikes), or university employee(s).

Four large variables between the different parties are their labor cost, workmanship, scheduling fulfillment and on-site (on-call) servicing availability were considered while comparing them.

The chart below characterizes each candidate according to a survey carried out between university students noting their subjective experiences with each of the respective candidates (In this case, University Employee was substituted by the students' own personal experience with fixing their bike. In the chart below, *University Employee* refers to bike maintenance duties to be fulfilled by an existing University of Illinois employee in a department with a bike sharing program.

	Local Bike Shops	**Campus Bike Project**	**University Employee**
Knowledge about Bikes **(Ability to do complex mainte-**	Expert	Amateur - Expert	Amateur
Labor Cost	High	Average to Low	None to Average (UI Hourly Pay)
Workmanship	Excellent	Average	Depends on the person
Scheduling Fulfillment*	Good	Above Average	Below Average
On-Call Availability	Not Likely	Not Likely	Certainly Available

Between Champaign County Bikes and Durst Fitness & Bikes, Durst seems to be the better candidate due to its proximity to campus and good history of providing excellent service to it clients.

The goal in each department as a best-case scenario is to have a University Employee who would be willing to maintain bikes for free.

His or her knowledge or resources about bike maintenance may be limited, but fulfilling even the simplest maintenance duties:

- maintaining tire pressures
- lubing the chain
- checking overall functionality of the shared bicycles

These easy routine maintenance would greatly lower maintenance costs and extend the longevity of the shared bikes.

Maintenance and repair procedures those require special tools and/or expert knowledge can be performed by members of the Campus Bike Project or any local bike shops.

Troubleshooting Section

Disclaimer

All possible insurance risks regarding the bicycle and their riders is the sole responsibility of the department sponsoring the program. Since there is no campus backed program regarding any and all biking issues it's up to each individual department to resolve all possible problems.

What if a bike breaks?

The department should allot a yearly maintenance budget of $60-100 to cover any concerns regarding repairs and general maintenance. This budget should cover all such expenditures.

Seasonal concerns?

Leaving bikes exposed to inclement weather will speed the aging process of each bike. At the expense of each department, it is in their best interest to find a proper storage area if available.

Possibly talk to the bike shop regarding a possible contract with the school?

At this current time no bike shop around campus offers this option, however it is a possibility in the future.

Troubleshooting Guideline

Solution Difficulty Key (See Chart on Following Page):

Very Easy
No tools required. Doable with hand, and possibly some consumable items like a bike lube and a rag.

Easy: self-serviceable
Common tools such as a Phillip head or a flat head driver may be required along with a consumable items like bike lubes and rags. The servicing procedure does not take more than 5 minutes

Medium: May require some expertise or consulting a manual.

Somewhat difficult
Almost certainly requires a bike maintenance expertise, and a manual. May take an extended period of time for the repair

Difficult
The servicing procedure requires a special tool and professional knowledge

Symptom	Possible Culprit	Solution	Solution Difficulty
Screech When Braking	Worn Brake Pads or Dirty Braking Surface	Clean rim surface with a dry cloth or replace the brake shoe if it is excessively worn	1 (cleaning rim) 2 (shoe replacement)
Chain binding / becoming tangled	Dirty, Rusty Chain	Lube chain, and if it does not improve, replace chain	1 (Lube / clean) 4 (Replace)
Chain “jumps cogs”	Inappropriate adjusted derailleurs	Adjust derailleurs, if not better, inspect for damages and replace if needed	3 (adjustment) 4 (replacement)
Seat moves around	The seat post adjuster is not closed tightly OR Seat is not bolted to the seat rail sufficiently	Tighten the seat post clamp or tighten the seat onto the seat rail	1 (adjustment)
Excessive brake lever travel to engage brakes	Stretched cable or worn brake shoes	Decrease the lever travel through cable tension adjustment screws, and if it is not sufficient, shorten the cable length at each brake caliper	1 (screw adjustment) 2 (Cable length adjustment)

Appendix A: Checkout Sheet

The Checkout Sheet on the following page should be printed out and supplied to the Bike Sharing Receptionist or whoever is in charge of checking bikes in and out. It is to be filled out by the employee who is checking out a bike. Once all of the sections on the sheet have been filled out, the completed sheet should be sent to Amelia Neptune at Facilities and Services. The sheet should then be replaced with a blank new one.

Please fill out the following form upon checking out a bike. The Date In, Initial In, and the last three boxes should be filled out upon returning the bike. Please fill out form as accurately as possible.

Name:	Date:	Time Out:	Bike #:	Date In:	Initial In:
	/ /			/ /	

I am using this bike instead of: □ **Driving** □ **Taking a Bus** □ **Walking** □ **Other:**

What was the approximate difference in travel time between biking and the method of transportation specified above?

Maintenance Check: □ **Tires** □ **Wheels** □ **Brakes** □ **Frame**

Maintenance Notes:

Name:	Date:	Time Out:	Bike #:	Date In:	Initial In:
	/ /			/ /	

I am using this bike instead of: □ **Driving** □ **Taking a Bus** □ **Walking** □ **Other:**

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Maintenance Notes:

Name:	Date:	Time Out:	Bike #:	Date In:	Initial In:
	/ /			/ /	

I am using this bike instead of: □ **Driving** □ **Taking a Bus** □ **Walking** □ **Other:**

What was the approximate difference in travel time between biking and the method of transportation specified above?

Maintenance Check: □ **Tires** □ **Wheels** □ **Brakes** □ **Frame**

Maintenance Notes:

When form is filled out completely, please return it to Amelia Neptune at Facilities and Services

aneptune@fs.illinois.edu

Appendix B: Departmental E-mail

Hello! This email is to notify you of a new program our department is offering. We have just set up a new Bike Sharing program for all faculty and staff members in the (_Your Department Here_) department. This program allows you to check out a bike for work related transportation just like checking out a library book. Here is what you have to do:

Go to (_Person overseeing the program's name here_) when you would like to check out a bike. They will ask you to fill out a brief checkout form. (The form is important to fill out fully and accurately because this program is a part of a research project being done by an ENG 315 class. The class is researching how successful a bike sharing program for faculty and staff would be and if it would be worth expanding campus wide. When the form has been filled out completely it will be returned to Facilities and Services so that they can compile the usage data.) After you have completed filling out the form, (_Same person's name here_) will give you a key to a bike lock. You may use this key to unlock the bike you have just checked out and use it for transportation around the campus. When you are finished with your bike, please return it to (_The location where the bikes are kept_), lock it up and return the key to (_Person overseeing the program's name here_). They will have you fill out a few more sections on the checkout form and then the process is complete.

(_Person overseeing the program's name here_) will provide more details on where to find the bikes, how to lock them and how they may be used.

There are currently (_#_) bikes available for use in the program. Being able to check out a bike is subject to availability.

You may find this new program very useful when you use it. Because of heavy automotive and pedestrian traffic on campus, driving through campus can be a challenge and time consuming. Using a bike to navigate campus can be a lot easier and quicker because of the availability of bike paths where there are no roads. We hope you both enjoy and find this new program very beneficial.

If you have more questions regarding this program, how to use it or how it works, please contact (_Person overseeing the program's name here_).

(_Person overseeing the program's contact information here_)

Thank You!

Photo Credits

Page 1:
http://www.via1.org/travel/uiuc

Page 2:
http://www.flickr.com/photos/loisorosa/3999358237/

Page 4: (Left to right, top to bottom)
http://www.bicycleparts.us/chains.htm

http://www.northerntool.com/shop/tools/product_200430889_200430889

http://mountainbikesgear.com/mountain-biking/how-to-fix-a-flat-mountain-bike-tire/

Page 6:
http://www.c4cycling.org/2010/07/28/bike-sharing-service-rolls-into-chicago/

Page 7:
Pictures taken from the cites that are linked on Page 7.

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http://unofficialbikeguide.blogspot.com/2011/07/why-is-my-bike-so-hard-to-pedal.html

Page 14:
http://www.flickr.com/photos/31168431@N07/5639275248/