

How to keep your bicycle from being stolen.

No matter how well a bicycle is secured, it can be stolen. Locks are meant to keep amateur and opportunistic thieves from taking your property. To keep your bike safe from a professional thief, you need to create a situation where the chances of getting caught are high compared to the value of the bike. Here are some tips to do just that.

1. ALWAYS lock your bike. Most stolen bikes were left unlocked for just a minute while the owner went to do something else. An unlocked bike, even if it is only worth a few dollars, provides opportunistic thieves a chance to get a bike for almost no risk. Anytime you can't see the bike, it should be locked up.
2. In public places, lock the bike in a high traffic area. Some will argue that if you lock the bike in a hidden area the thieves won't find it. The problem is, that if they do find it, they will have almost unlimited time to defeat the lock and steal the bike. Select a site in which the traffic will be high for the entire time that you plan to leave the bike. If necessary, park at a high traffic area and walk to your destination.
3. Locking the bike requires a strong lock, a solid immobile object and good locking technique. The bike is only as secure as the weakest of these.
4. You must secure ALL of the parts of your bike that you do not want stolen. Thieves are willing to steal parts of your bike. Replace quick release seat bolts with regular bolts. Fill in allen heads on the rest of the bike with solder or wax so that a thief has to remove the filler before using an allen wrench to remove bike parts.
5. Consider riding an older "junkier" bike or changing the appearance of your bike so that it isn't as attractive.
6. Consider using more than one type of lock. Leave a strong U-lock at work or school and then carry an additional cable or chain lock. Use both of them to secure the bike during the day and carry the less secure lock with you in case you need to make a quick stop somewhere.
7. Register the bike with the local police department if they offer the service. You need some way to prove the bike is yours if it is recovered.

How to select a strong lock:

Remember, all locks can be defeated! Even the strongest and most expensive locks can be defeated with power tools in minutes. No lock is a match for an electric grinder *designed* to cut through metal. Carrying a grinder and extension cord is very conspicuous and grinders make noise. So thieves won't use them unless the value of the bike is high and the traffic in the area is low.

Types of locks and the methods thieves will use to defeat them:

U-locks (sometimes called D-locks)

Pros: Strong lock with reasonable weight. Good choice when used correctly.

Cons: They limit the size of the object to which you can lock the bike. (i.e. a post)

Advice: Buy the thickest, heaviest, hardest U-lock that you can afford. Then use it to secure both wheels and the frame to something solid and immovable.

Popular attacks used by thieves:

Bolt Cutters: The cheapest of the U-locks can be cut with a good pair of bolt cutters provided that the thieves can brace one leg of the cutters against the ground and use their body weight to cut the lock. Proper locking technique will get the lock high enough off the ground that they can't use this technique. Purchasing the best U-locks, which are the thickest and hardest, provides some additional protection against this technique.

Prying the lock open: Thieves will use small car jacks or long pry bars and wedge them into the lock and then pry the lock open. Again proper locking technique can minimize this attack. A properly locked bike should take up almost all of the room in the U-lock denying the thief an opportunity to wedge anything into the lock. Purchase a lock that is the right size and reduce the room the thief has to work.

Avoid U locks with a side locking mechanism where the lock protrudes significantly from the shackle (See picture at right). Thieves will place a pipe on the end that protrudes and pry the lock open with the additional leverage.



Special Note: U-locks manufactured by Kryptonite between 20 Sept 1998 and 20 Sept 2004 used a cylindrical locking mechanism that was susceptible to being picked. A class action settlement agreement can be viewed at <http://www.kryptonitesettlement.com>. Avoid using these locks or replace them!!

Cable or Chain

Pros: Allows you to secure the bike frame and both wheels simultaneously. Provides reach needed to lock your bike to a wide range of immovable objects. Chains or cables make it possible to lock up more than one bike at a time.

Cons: Cable locks are markedly less secure than U-Locks. Even the thickest cable can be cut in seconds. High quality chain, which approaches the security of a U-lock, is heavy!

Advice for choosing a chain: Obtain the heaviest chain that you can comfortably carry. The thicker the steel, the more protection it affords. Chains should be constructed of "hardened alloy steel". Hardening makes the chain resistant to sawing or cutting with bolt cutters. Avoid chains hardened all the way through. It is possible to break a 100% hardened chain with a hammer blow. If the inner core isn't hardened, breaking the chain with a hammer or cutting it with bolt cutters is made difficult; however, the hardened outer jacket still protects the chain from the hacksaw.

Advice for choosing a cable: Cable locks should only be used to lock up your bike while you run a quick errand or in conjunction with another more secure lock. Cable locks should only be used in very low crime areas. Purchase a cable thick enough that it can't be cut with a pair of wire cutters. Watch out for cheap cables with thick vinyl coating and thin cables. If the cable has loop clamps, ensure that the clamps are not crimped around the vinyl coating. Thieves may thwart the loop clamp by heating the clamp thus causing the vinyl beneath to melt. This may provide enough slack in the clamp to open the loop.

Popular attacks used by thieves:

Bolt Cutters: Even the thickest cables can be cut with bolt cutters. Chains may be cut with a pair of bolt cutters provided that the thieves can brace one leg of the cutters against the ground and use their body weight to cut the lock. Proper locking technique will get the chain high enough off the ground that they can't use this technique.

Hack saws/Hammer and Chisel: Cable doesn't hold up well to hacksaws. Even the thickest cable can be cut with a hacksaw. A hammer and chisel can be used on lower grade chain or used to shatter chain that is hardened all the way through. Keeping the chain off the ground denies the attacker something solid to strike against.

Less popular techniques used by thieves on ALL locks: Smashing the lock with a hammer against the ground (This technique can be thwarted keeping the lock away from the ground); Using a blow torch, grinder, liquid nitrogen, or picking the lock. These techniques require conspicuous tools or require too much time to be practical. While they are possible, they are not the preferred methods.

Selecting a solid immobile object:

Make sure the object is actually solid and immobile. If thieves can spend less time cutting the object than the lock they will.

Don't lock the bike to a chain link fence (thieves will cut the fence)

Don't lock the bike to a sign (thieves will remove the sign and lift the bike off the post).

Don't lock the bike to a tree (thieves may cut down the tree).

Don't lock a bike to itself (thieves will simply carry it away).

Don't lock a bike to a soft aluminum pole or thick steel pole (easily cut).

Watch out for posts or bike racks that aren't really secured. Thieves can remove a bolt faster than they can cut a lock.

Proper locking technique:

Position the lock as high off the ground as possible. Keep the lock high on the bike by closing the shackle around some portion of the bike, such as the handlebar or seat support.

Always try to anchor both wheels as well as the frame with your chain or cable. With a U lock remove the front wheel and lock it with the back wheel so that the space inside the U is mostly filled.

At right: Proper locking technique with one U lock. Both wheels and frame locked with the lock. Would be even better is the lock were higher off the ground.



Very poor locking technique with one U Lock.

Good Locking technique with a cable and a U lock. The U lock is mostly filled and it protects the rear wheel and frame. The cable protects the front wheel, seat and frame as well.



The U lock need not go around the frame to provide protection. In this case the rear wheel cannot be removed from the rear triangle with the lock in place. Most of the space in the lock is used up. Cutting the rear wheel, while possible, is very unlikely. The wheel is under tension and it is too much work for the typical thief.



Good use of a cable lock for low crime areas. Both wheels and frame secured.

Major lock manufacturers:

There are 3 main manufacturers of bicycle locks;

- 1.) Kryptonite (<http://www.kryptonitelock.com/>)
- 2.) OnGuard (<http://www.onguardlock.com/>)
- 3.) Abus (<http://www.abuslocks.com/>)

Stick with a lock from one of these companies because they send their locks for testing at independent testing agencies.

Independent Testing agencies:

There are 3 main agencies and one cycling magazine that test locks. ART and SoldSecure seem to test the most locks.

- 1.) VdS (Germany) (http://www.vds.de/Physical_security_technol.209.0.html)
- 2.) The ART foundation (Holland) (<http://www.stichtingart.nl>)
- 3.) SoldSecure (UK) (<http://www.soldsecure.com/>)

Table comparing some of the top locks commonly available in the US. Abus is based in Germany and the locks are harder to find in the US so they have been left out of the table. The prices are from various vendors on the internet and are meant to give an approximate cost.

Name	Type	Thickness	Wt	Length	ART rating	Sold Secure	Manuf Rating	Theft Prot	Price
Onguard Brute 5001 std	U-lock	16mm	4.5	4.2"x7"	4/5	Gold	5+/5+	??	\$39.95
OnGuard Mastiff 5019	Chain	10mm	1.7	3'	3/5	Silver for mastiff 5019/5020	5/5+	??	\$34.95 + ship
OnGuard Beast 5016	Chain	14mm	14	4'	4/5	Silver	5+/5+	\$3500?	109.95 +ship
Kryptonite NY chain	Chain	10mm	6.1	3'3"	4+/5	Gold	10/12	\$3000	\$79.95
Kryptonite Fahgettaboudit	Chain	11mm	8.4	3'3"		Gold	12/12	\$3500	\$119.9 + ship
Kryptonite NY U-lock	U-lock	16mm	3.9	4"x8"	4/5	Gold	11/12	\$3000	64.95 +ship
Kryptonite Fahgettaboudit U-lock	U-lock	18mm	4.6	6"x3.25"		N/A	12/12	\$3500?	\$74.99 +ship

SoldSecure rates on a scale of Gold, Silver, Bronze

ART rates on a scale of 1 to 5 stars

Resources used in compiling this information:

An Article on slate called "Avoiding the bicycle thief" (<http://www.slate.com/id/2140083/>). The author attacks various locks with various tools and gives his results.

Article about bike theft in Portland and what police are doing about it.
<http://bikeportland.org/2006/03/28/bike-theft-out-of-hand-police-want-to-help/>

An older test (1997) of bicycle locks
http://www.student.uit.no/aissm/uk_total.html

A summary of a test in Cycling Plus about cutting chains and locks with power tools
<http://www.bikeforums.net/showthread.php?t=147776>

An article on how to lock up a bike properly
http://www.sfbike.org/?theft_locking&PHPSESSID=6aa5421fdc22e46ed9585aea19b1f59

Article from the San Francisco State University Police Dept on preventing bike theft.
http://www.sfsu.edu/~dps/html/crime_prevention/bike_theft.html

Article from Why Cycle on bicycle security and locks
<http://www.whycycle.co.uk/safety-locks.htm>