



 eBike Labs

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Article for mobility operators  
who take e-bike fleet  
security **seriously**



It goes without saying that theft in e-bike sharing is a growing problem that is a serious barrier to spread out its adoption in cities. By adopting the most reliable anti theft system, e-bike fleet operators can save thousands of dollars!

The objective of this article is to address theft in e-bike fleets, by understanding its underlying motives and going through available theft deterrents. **We'll wrap up with the anti theft system that provides the highest security to e-bike fleets.** We intentionally skipped theft statistics in bike sharing, because we assume you know them very well. But in case you don't, you can find these in the appendix.

Let's dive it!

# If you want to prevent theft, you must think like a thief

Understanding the underlying motives of theft is the first step to choose the best anti theft system. Not all bicycles are stolen for financial gain. In fact, a lot of offenders may take a bicycle simply to get from one place to another and then abandon it. The motivations of e-bike thieves can be categorized in the following way: joyriders, cash converters and professionals.

## 1. Joyriders (or opportunists)

Joyriders are those who steal bicycles for transportation and/or enjoyment. They will generally abandon the vehicle after using it. These opportunists are looking for easy and hassle free theft. They are targeting e-bikes with visible, easy to destroy locks.

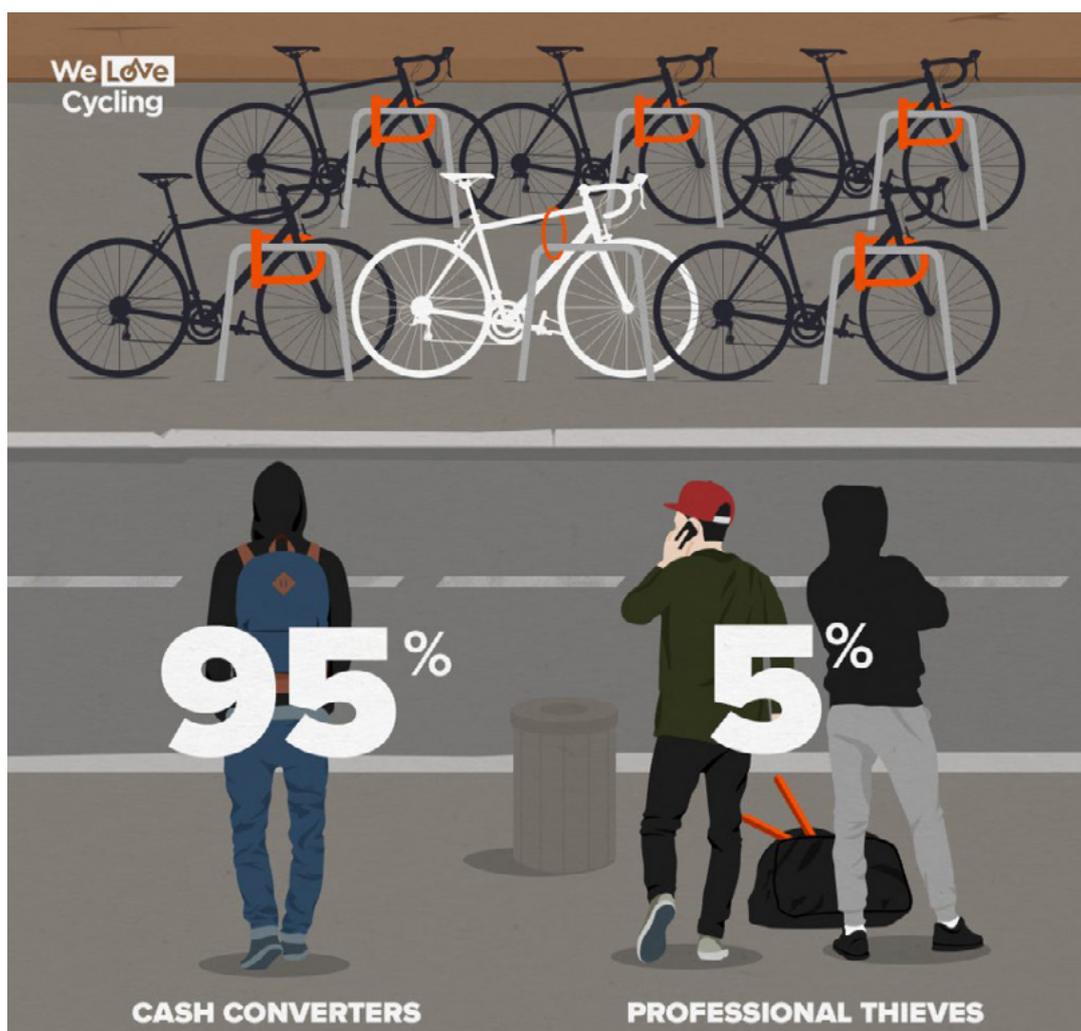
## 2. Cash converters

Cash converters are those who exploit opportunities to steal components and/or electric bicycles and trade

them for cash or goods. They are carrying hand held cable cutters, maybe some medium sized bolt cutters, crowbars. Generally, they are looking for the most valuable e-bike component, which is the battery.

## 3. Professionals

Professional thieves steal specific types of e-bicycles to order. They come in organized gangs and with superior tools.



# Theft deterrent market offerings

Nowadays, theft deterrent systems come in three options: electronic frame locks, electronic cable locks, and electronic motor locking systems. Of course, there's also the good old mechanical cable or chain lock, but this is not suitable for fleet operators, for obvious reasons.



Example of electronic frame lock

## Electronic frame locks

Electronic frame locks, also known as wheel/ring locks, provide basic wheel locking. They are installed on the frame of e-bikes and block the rear wheel. Some electronic frame locks are auto locking/unlocking. These devices can be intrinsically dangerous for riders: if, for whatever reason, they re-engage while the e-bike is moving, they will cause an abrupt stop which can be fatal for the cyclist.



Example of electronic cable lock

## Electronic cable locks

Electronic cable locks are usually integrated close to the wheel of the e-bike. When users lock the cable, they automatically lock the wheel of the e-bike as well. The cable itself is flexible, and it lets users attach e-bikes to street furniture. The end of the cable that goes through the wheel is a metal rod. The metal rod of electronic cable locks is generally more resistant compared to the metal ring of electronic frame locks.

**The weak point of electronic frame and cable locks is that they are visible and thus can be tampered with.** Frame locks can be easily destroyed with, for example, grinders. e-Bikes with electronic cable locks are more difficult to steal, because e-bikes are attached to fixed street furniture, plus they have a metal rod that adds extra resistance to theft, beyond the cable itself. However, electronic cable locks are also breakable. There are plenty of cutter tools available on the market that thieves can easily carry in their bag. [This video](#) is a great example about how easy it is to break visible locks.



# eBikeSafe - electronic motor locking system



eBikeSafe anti theft system

Electronic motor locking systems replace hardware locks and lock the wheel of the e-bike using the motor itself. Since the system is embedded into the motor, **the only way to bypass the lock is to destroy parts of the drive system, which will make the electric bicycle inoperative.** At eBikeLabs we've brought the electronic theft deterrent to the next level by introducing the eBikeSafe anti theft system that is specifically engineered for e-bike sharing. **eBikeSafe offers:**

 **Maximized security and protection against battery theft:** eBikeLabs' vehicle control unit is uniquely paired with the battery, making it impossible for them to work separately. Thus, when locking through the user's smartphone app or from the operator's backend, every electronic component is shut off. There is no way for thieves to use the e-bike properly nor to resell the battery, because the electrical component identities are linked.

 **Independence from the battery and safe remote control:** eBikeSafe works even with the empty battery. Mobility operators can also remotely lock/unlock the locking system. The action can be performed in a safe way, only when the e-bike is not moving.

 **Safety for riders:** the eBikeSafe anti theft system is gradual and can't cause the user to fall, even if engaged due to some failure.

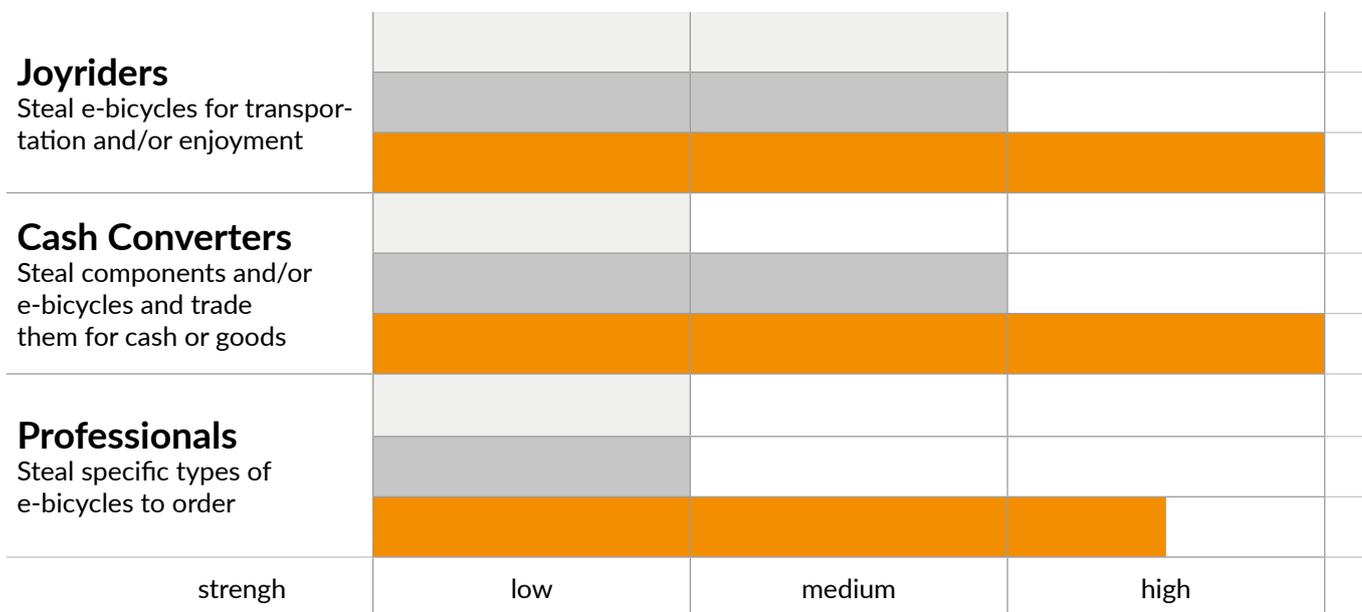
 **Can be integrated in any e-bike** equipped with a wheel motor, while similar anti theft systems are proprietary and come with an already designed electric bicycle.

**When thieves try to ride or move such locked e-bikes, they will find it extremely difficult. The motor will use both the thief's own force as well as any battery energy to counter any movement.** Separating the motor from eBikeLabs vehicle control unit won't help the thief, because the paired motor will refuse to operate. Furthermore, the e-bike will continuously emit a strident noise and flash its lights during any theft attempt.



# Strength of anti theft systems against thieves in e-bike sharing

As we went through available theft deterrents and e-bike thief types, we can compare the strength of anti theft systems and relate them to joyriders, cash converters and professionals.



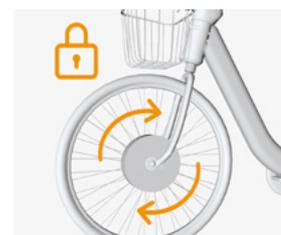
Electronic frame lock



Electronic cable lock



eBikeSafe anti theft system



The eBikeSafe anti theft system provides a higher level of protection for e-bike fleets, because it is engineered specifically for e-bike sharing and addresses the underlying motives of the e-bike thieves.



# eBikeSafe provides higher e-bike fleet security than any existing locks. Here is why:



Electronic frame locks are breakable.



*e-Bike fleet protection*



Electronic cable locks are better, because they provide additional security to e-bikes, but locks are still breakable.



*e-Bike fleet protection*



**eBikeSafe** replaces hardware locks and blocks the e-bike wheel using the motor itself.



*e-Bike fleet protection*



To provide the strongest security to e-bike fleets, operators can combine eBikeSafe with an electronic cable lock, thus securing both wheels of the e-bike and attaching the e-bike to street furniture.

## Addressing vandalism

Along with e-bike theft, vandalism is a growing problem for fleet operators. While fighting against vandalism requires mutual efforts by the city, citizens, and businesses, fleet operators can protect themselves by securing GPS devices in e-bikes, requiring users to attach e-bikes to fixed racks and obtaining fleet insurance. The insurance must include private liability and public damage. The e-bike design also matters. Operators should incorporate theft-resistant features such as protected and invisible screws and cables.

## Conclusion

In some cities, theft can force e-bike sharing companies to drop operations. Understanding the local problem is the most important factor that helps to make the best decision when choosing a theft deterrent system. Adopting the most reliable anti theft and providing the best user experience are key factors to create sustainable and profitable e-bike sharing fleets, especially when it comes to large scale deployment. **The golden rule is to remember that theft prevention is always better than cure.**



## Appendix:

According to figures unearthed by Le Monde, in Reims France, where Gobee had deployed 400 bikes in November 2017, only 20 remained in working order at the beginning of January 2018. The other 380 bikes had been damaged, broken, or stolen<sup>(1)</sup>. Mobike said that 10% of the Manchester fleet was stolen or destroyed each month during the summer<sup>(2)</sup>. According to Le Parisien, 600 to 1,000 Velib bikes are stolen or privatized every week<sup>(3)</sup>.

Reports show that bike sharing market is expected to grow and e-bikes represent one of the fastest growing segment of transportation. The global e-bike market was estimated at USD 21,1 billion in 2018 and it is expected to reach USD 38.6 billion by 2025<sup>(4)</sup>. And the trend is obvious. Cities are moving towards sustainable mobility and e-bikes are the best mode of transportation to replace cars. With e-bikes, we can go longer distances, carry the load; e-bikes are fast, good for the environment and health.

<sup>(1)</sup> [www.lemonde.fr](http://www.lemonde.fr)

<sup>(2)</sup> [www.theguardain.com](http://www.theguardain.com)

<sup>(3)</sup> [www.leparisien.com](http://www.leparisien.com)

<sup>(4)</sup> E-bike Market by Class, Battery Type, Motor Type, Mode, Usage And Region - Global forecast to 2025

About  eBikeLabs

At eBikeLabs, our mission is accelerate the adoption of shared e-bikes in cities. Because we believe that e-bikes are the best solution to mobility demands - they are fast, for everyone, they are good for the environment and health.

To achieve our mission, we work with mobility operators and we help them create reliable, sustainable and profitable e-bike sharing fleets. At eBikeLabs we build the vehicle control unit that transforms affordable e-bikes into theft proof, low maintenance, and enjoyable fleet vehicles.

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