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Free Wheels: An Assessment of Bicycle Theft in Denmark

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Free Wheels: An Assessment of Bicycle Theft in Denmark

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Abstract
This project, sponsored by the Danish Cyclist Federation, describes the current state of bicycle theft in Copenhagen with the ultimate goal of recommending the best solutions to help reduce the problem. From our research it was concluded that the cycling infrastructure is insufficient to successfully support a technological solution and the general attitude towards the individual's ability to prevent bike theft needs to be improved. In addition to fully documenting our results in this report, our research has led to the development and proposal of a cohesive social awareness campaign on bicycle theft.
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Chapter 1: Introduction

Denmark strives to be green, and as such, green initiatives can be found throughout Danish culture. Cycling is an integral part of this and reflects both the ecofriendly and healthy lifestyle of the country. Trailing only the Netherlands in cyclists per capita, Denmark aspires to encourage a thriving cycling community and the number of residents who take up cycling continues to grow (Dutch Ministry of Transport, 2009). The most common use for the bicycle is as a mode of transportation, and from 2008 to 2011 an average of 36% of all travel to work or school within Copenhagen was made by bike (The Technical and Environmental Administration, 2011). The city aims to increase this percentage to 50% by 2015 and to achieve zero carbon dioxide emissions by 2025 (The Technical and Environmental Administration, 2011). Unfortunately, there are obstacles to such a lifestyle; one of which is the theft of bicycles.

With its large number of cyclists, Denmark unfortunately offers ample opportunities for bike thieves. An estimated 70,000 bikes are stolen per year (Statistics Denmark, 2012) which, while small in comparison to the total number of bikes, still has a significant psychological effect on people’s willingness to cycle. Since nine out of every ten Danes own at least one bike (Madsen, 2010), theft can affect a very large number of people. Conventional methods, such as locks, have been found to be insufficient as more organized bike theft rings take entire bike racks with locks still attached (Johnson, Sidebottom, & Thorp, 2008). A host of new technologies exist to minimize this issue. For example, RFID, or Radio Frequency Identification, has been implemented in multiple locations. Bikes are tagged with an RFID transponder, which can be checked by a reader, allowing for automatic identification of stolen bikes. Despite these advances, technology alone does not solve the whole problem.

Up until now, most efforts implemented to minimize theft have focused on the technological aspects, with better locks and better tracking being the two main recommendations for theft prevention (Glynn, Houle, & Schweers, 2005). Yet these technical measures ignore the other half of the equation, one potentially far more important than often thought. This factor is the institutions, and is not just limited to the Danish cyclists themselves, but to the police, politicians, insurance companies, advocacy groups and bike dealers. Each group has a different interest in the matter, but coordination thus far has been limited. Despite its large number of cyclists, this lack of coordination has caused Denmark to trail behind other countries in innovative and effective solutions to the problem (Cycling in the Netherlands, 2009).
Therefore, this project intends to investigate key factors - from technology, to economics, to policing, to cyclist behavior - in order to better understand the dynamics of bicycle theft in Copenhagen and to identify feasible strategies to reduce it.
Chapter 2: Background

The bicycle is an integral part of both the culture and society of Denmark. It has become a natural choice of transportation for many Danes, and increasingly serves as an instrument for promoting green initiatives and public health and safety programs. In the next section, we will describe the culture of cycling in Copenhagen and its importance in reducing carbon emissions. This leads us to understand how the effort to encourage cycling is hindered by bicycle theft. We then consider technological and social anti-bike theft measures and how these methods are being implemented in foreign countries. The final section discusses the stakeholders in Denmark and their respective roles with regards to this problem. This background chapter presents the context in which our project fits and paves the way for our research objectives and methodology, laid out in the following chapters.

2.1 Denmark: Cycling Nation

Cycling is a fundamental part of Danish culture and contributes to the eco-friendly and healthy lifestyle that Denmark encourages. The country has embraced a new model of society, centered on developing and maintaining a green, healthy and safe standard of living (Ruby, 2012). In recognizing the bicycle as an indispensable tool to this model, the city council of Copenhagen has devised “The City of Copenhagen’s Bicycle Strategy 2011-2025.” It is a comprehensive, forward-looking plan intended to accelerate Copenhagen’s continued effort to develop and improve both the infrastructure and policy that facilitate the growth of Danish bicycle culture, ultimately resulting in a more livable society free of carbon emissions (The Technical and Environmental Administration, 2011). The strategy identifies four key areas under which advancements have been, and will be, made to encourage a modern and thriving cycling community.

The first of these areas is titled “City Life”. The idea behind this concept is to increase Copenhagen’s attractiveness for cycling. It specifically describes collaboration with stores and other commercial and public destinations to increase and improve their bicycle parking facilities. Under the plan, accommodations for cargo bikes will be integrated into the building of new bicycle parking. Supplementing these measures for parking bikes are experimental projects to improve the experience of cyclists on the go, seeking to utilize LED lighting fixed into the roads for dynamic traffic directing and lane allocation to maximize usage of all road and sidewalk space between the various means of transit (The Technical and Environmental Administration, 2011). With these plans designed to increase the attractiveness of cycling, there are also strategies to encourage cyclists.
The second area is cyclist comfort. A key element of this portion of the plan is the “city bike” program, an innovative public bike-sharing system discussed at length further in this chapter. The initiative, renewed for 2013, will debut a revitalized bicycle frame outfitted with an electronic tablet, distributed in a fleet of approximately 1,250 bikes near train terminals to encourage cycling among commuters and tourists (Wenande, 2012). Following the goal of “City Life” to improve parking, the successful upgrade of parking facilities at Svanemøllen Station is cited along with improvements made to the “Bicycle Butler project”, an initiative to reduce the congestion created from abandoned bicycles. Likewise, the plan points to an increase in the budgets for bicycle facilities maintenance to 10M DKK per year (1.8M USD) and bike lane snow removal to 2M DKK (360K USD) per year (The Technical and Environmental Administration, 2011). These methods work to preserve cycling as a natural transportation option in Copenhagen.

The third area of interest is travel time. Stating that “48% of Copenhagen cyclists say that the main reason they choose the bicycle is that it is the fastest and easiest way to get around,” (The Technical and Environmental Administration, 2011) the plan puts forth several recent initiatives and projects that address the need for quick and convenient bicycle routes. Many of these were slated for completion in 2012, including opening direct pathways for cyclists through bridges, removal of one-way streets for cycling and the construction of a bicycle “super highway” to allow for easier transportation between Copenhagen and surrounding municipalities (The Technical and Environmental Administration, 2011). These projects ultimately aim to increase cycling’s competitive edge as an alternative mode of transportation.

The final area is cyclist safety. In encouraging cycling as the primary mode of transportation, an environment conscious of the needs and concerns of cyclists must be fostered. As Pucher and Buehler noted, the 81% decrease in cyclist fatality rates from 1978 to 2006 and 36% increase in kilometers cycled per inhabitant in Dutch cities are strong evidence of the impact of improved bicycle infrastructure and restrictions on car use. One of the primary methods listed for facilitating cyclist safety in Copenhagen’s plan is bicycle-only lanes, designed for putting distance between cyclists and motorists on shared roads. Coupled with this is an effort to educate cyclists in the proper etiquette for bike lanes (The Technical and Environmental Administration, 2011). By developing both socially and structurally a space in which cyclists may feel respected and protected, Copenhagen will inherently encourage the use of bikes.
The emphasis placed by city planners and municipal bodies on continuously advancing cycling is reflected in the average of 36% of all travel to work or school within Copenhagen being made by bicycle from 2008 to 2010 (The Technical and Environmental Administration, 2011). The increase in the number of bicycle trips from 1970 to 2010, shown in Figure 1, as well as Copenhagen’s plan through the year 2025 is displayed in the graph below from the 2011 Copenhagen Cycling Strategy published by the Technical and Environmental Administration.

![Figure 1: Number of bicycle trips in Copenhagen from 1970 to projected goal for 2025 (Technical and Environmental Administration, 2011)](image)

The popularity of this mode of transportation is distributed almost equally across genders in Denmark, with 45% of all bicycle travel made by women. It also reaches to both ends of the age spectrum, constituting 10% of all travel made by those 60-69 years old, 12% for those 70-74 years old, and 20% for those 16-19 years old from 2000 to 2002 (Pucher & Buehler, 2008). Likewise, as Pucher and Buehler mention, cycling as a mode of transportation extends through social ranks, with similar rates across income classes. Holding this unique status among the methods of transportation, cycling has become an activity fundamental to the culture of the Danes.

2.2 Bicycle Theft in Denmark

With the mission of creating a clean, healthy and habitable society by way of cycling, Denmark also faces challenges to this goal. One of these challenges is bicycle theft, which poses a real and serious obstacle to the promotion of an active cycling culture. Despite a decrease in reported thefts from 2009 to 2011, there were still 71,697 documented cases in 2011 (Statistics Denmark, 2012). As reported by Christian Wenande in an article for the Copenhagen Post, this crime results in a loss of 250M DKK (44M USD) per
year. Due to the presence and likelihood of theft, cyclists are discouraged from travelling to certain destinations and investing in high quality bicycles (Banker, Keches, & Murphy, 2006). The reality of this issue strains the progress and potential of Denmark’s cyclist-oriented society.

The driving factors behind bike theft are numerous, including both the motives of thieves themselves and the behaviors and responses of the institutions that are affected by it. Detailed more specifically in the following section, theft has long been the consequence of individuals stealing for easy money or a free ride, though at least one incident of organized theft has occurred. This is supported by Jyllands-Posten’s report on the arrest of 12 Lithuanian men who stole high-valued bicycles from locations throughout Copenhagen and transported them out of the country. Advertisement websites such as Craigslist and Den Blå Avis (DBA) have also provided avenues for the trade of stolen bikes as, according to Wenande, stories have circulated of cyclists who have found their stolen bikes listed on these sites. Holst, in writing for the Danish newspaper Politiken, mentioned a recent trend in reports on this illicit use of online market portals, especially Den Blå Avis. He quotes DBA’s Head of Customer Support, Lene Kristensen, who states that user accounts and their associated ads suspected of selling stolen bikes are closed. Then DBA will subsequently inform the police and require the users of those accounts to validate their identity using their NemID, which is tied to their bank, in order to log in again. Additionally, thieves have made use of prepaid cell phone cards, which require no identification for purchase, to anonymously sell off stolen bikes (Astrup, 2012). Thus, there have been several resources that have been exploited to support the trade of stolen bikes.

In a similar manner, Denmark’s cycling community suffers from a lack of engagement and effectiveness on the part of law enforcement. Listed in the Statistical Yearbook published by Statistics Denmark, only 663 of the previously mentioned 71,697 reported cases of bicycle theft resulted in criminal charges, constituting just 0.9% of the total instances. These numbers seem indicative of Wenande’s assertion that the Danish police lack the necessary resources and manpower to follow up on every theft report. Confirming this assertion, an article in IceNews included an admission by police officers that such a lack existed (IceNews, 2010). Furthermore, reporting on the testimony of one individual’s experience, Wenande describes how this man found his stolen bicycle posted to Den Blå Avis under the real information of the thief and yet could elicit no assistance or response from the police.
Stepping back to view the broader picture, these limitations are not confined to only the police. At a national level, there appears to be an absence of coordination across municipalities and nonexistent acknowledgement of the issue by the Justice Minister. As reported by Wenande, the Minister has been active in advocating legislation regarding municipal authority to relocate illegally parked bikes and increasing bicycle traffic fines, but has made no comment on the issue of theft. Mr. Frits Bredal, spokesperson for the DCF, echoed this concern in a correspondence with Politiken newspaper, stating “We have had a completely silent Justice Minister” (Wenande, 2012). Additionally, though a national catalogue of stolen bikes is in the works, its commencement has been delayed to a future date after the summer of 2013 with no decision as to whether its availability will be opened to the general public, which is a concept supported by several political parties (Astrup, 2012). In the same article, Astrup further points out the delay of an inter-ministerial group working on the issue of prepaid cell phone cards, which was intended to conclude its work earlier in the year. Hence, it is clear that the issue of bike theft extends to all levels of government in some manner.

The fault, however, is not just confined to those in power; the people play a role as well. As observed by Banker, Keches and Murphy in a 2006 project to research and recommend improvements to the bicycle parking facilities at Copenhagen’s Nørreport train and metro station, there is a general trend to leave bikes parked in areas of most convenience to cyclists. This can result in many bikes being parked outside of provided racks and render parking spaces inaccessible or difficult to use. Likewise, there is an abundance of abandoned bikes wasting parking spaces at the station as respondents to surveys and interviews posed by this project indicated. This is also the disposal method of unwanted bikes for many cyclists, in lieu of the fact that bicycles are not collected in city-wide large garbage pick-ups due to concerns over stolen bikes. The general attitude towards parking at Nørreport is further supported by a variety of issues with parking. There is a lack of convenient parking, especially in the most popular areas. The accessibility of bicycles to the platforms is poor and there is insufficient indication of the existence of underground bicycle parking with direct metro access. There are also no accommodations for bicycles at all on the metro, despite the fact that it is allowed. Finally, the racks provided are poorly designed. They are difficult to use and cannot accommodate a variety of bicycle types with different tire widths or, as is the case on the trains, do not hold bikes firmly, causing a hassle for passengers when the bikes slide (Banker, Keches, & Murphy, 2006). As recommended by Banker, Keches, and Murphy based on the response of several stakeholders, bicycle parking facilities must receive priority when planning construction projects, given that their neglect during development often results in subpar
accommodations. Thus, there is a need for collaboration and effort across the stakeholders in developing and enacting solutions to address the issues at hand.

2.3 Current Anti-Theft Measures

Since the problem of bicycle theft is not new, there have been numerous methods, both technological and social, that have been implemented and tried over the years to prevent it. A simple and very effective method of preventing theft on the individual level is the bike lock. The basic design has not changed significantly in the past 40 years, though materials and quality have improved. Invented in 1972, the U-Lock has remained the most secure type of bike lock (Rossiter, 2009). Consisting of two components, a U-shaped metal bar and a lock, it is very simple and robust. When closed, a D is formed as displayed in Figure 2.

![Figure 2: U-Lock (City of Annapolis, 2013)](image)

The lock is placed around the frame and the bike rack. Due to the solid bar, the lock is very difficult to remove, but the trade-offs for this level of security are bulk, weight and difficulty to transport (Rossiter, 2009). In Denmark, this lock has been modified into the ring lock as displayed in Figure 3. Similar in principle to the U-Lock, the ring lock is smaller and fixed to the bike. Instead of locking the bike to the rack, the ring lock prevents the rear wheel from turning - immobilizing the bike. However, such a lock still does not prevent the entire bike from being picked up and carried away. As a result, the cable lock is often also used. Similar in function to a U-Lock, the rigid bar is instead replaced with a steel or composite cable. The result is a lighter, more portable lock, but it is easier to cut (Rossiter, 2009). Other, more advanced bike locks now include alarms or other mechanisms indicating they have been broken. These added features come at a price and are not widely used.
Despite how strong it may be, a lock is only as effective as the structure it is attached to. A bike locked to a metal bike rack is generally safe. Since these racks usually consist of both vertical and horizontal bars, bikes cannot be easily removed. However, despite their safety, these racks are not always used. Due to space constraints, bike racks, as shown in Figure 4, are sometimes placed far from the entrance to a destination. This scenario results in a significant drop in usage, where it has been observed that people will not use bike racks more than 150 feet (46 meters) away from an entrance (Johnson, Sidebottom, & Thorp, 2008). Instead, cyclists will use whatever is available and “fly park” their bikes. The most common objects used are parking meters, posts, or something similar. Unlike bike racks, these objects do not have any horizontal sections that prevent a bike from being lifted off (Rossiter, 2009). They are therefore much less secure.

The effectiveness of a lock is also dependent on the type of bike thief. Bike thieves can be divided into three categories: “joyriders,” thieves that steal for money, and those who steal by volume. Joyriders, usually people under the age of sixteen, simply take a bike because “it is there” and they want to go for a ride. Those who steal for money are often looking for a quick profit to purchase drugs or alcohol. Those who steal by volume intend to sell the bikes, often as “used” bikes, on the grey market (Johnson, Sidebottom, & Thorp, 2008). A lock will very easily deter the first category, which various studies have
indicated make up a significant proportion of all bike thefts (Johnson, Sidebottom, & Thorp, 2008). A lock can also deter the second type, especially if they are in need of cash quickly. It is estimated that if a lock takes more than five minutes to remove, the thief will move on (Rossiter, 2009). Bicycle locks do little to deter organized bike crime as there have been cases where entire racks have been stolen with the bikes still attached (Johnson, Sidebottom, & Thorp, 2008). Unfortunately, while a lock still remains the most effective way to prevent theft, it does little to aid recovery.

The main way bikes are recovered is via a Vehicle Identification Number (VIN) linked to an owner. This concept is not new, as the same system is used to track cars and firearms. However, it is severely hampered by the fact that people often do not know the VIN number on their bikes and do not have it recorded anywhere. Without a central database, this makes recovery very difficult. A VIN system coupled with online registration has been shown to be remarkably effective though. Bike owners simply create an account with their information, register bikes, and then report stolen bikes via the website. When a bicycle is recovered, its VIN can be checked online and the owner notified. Such programs have been implemented across the world, and the effects are significant. Unfortunately, there is one limitation to this system – stolen bikes cannot be easily identified when on a bike rack. There is no quick method for checking a large number of bikes.

Modern technology has provided a possible solution with Radio Frequency Identification, or RFID, which has been rapidly gaining popularity throughout the world. Small transponders emit a certain frequency which can be read by a computer, allowing for the tracking of objects without requiring owners to remember a number. These transponders come in two types – active and passive. Active transponders have their own power source, usually a small battery, and can be read from a further distance. Passive transponders receive power from a reader, and thus are always readable, though only at a shorter distance (Grau, Zeng, & Xiao, 2012). Applying such technology to bicycles has obvious benefits.

Ideally, a transponder would be placed on or in the bike with the unique frequency encoded digital code registered to a website database. If a bike is stolen, the owner will report it to that website, and if recovered, the bike can easily be returned. This is identical in function to the VIN system, but without the limitations of the VIN number. An RFID transponder also provides an additional advantage. A police officer could walk up and down a row of bicycles with a reader linked to the online database and quickly identify if any have been stolen. This is impossible to do with just a VIN number.
Various companies currently provide RFID services and anti-theft products targeted towards bikes. DataTag, a UK based company, sells a variety of items for preventing theft. Their smallest RFID transponder, Glass Tag, can easily be affixed anywhere on a bicycle. They also provide visual deterrents, in the form of warning labels and impossible-to-remove ID labels (DataTag, 2013). These products are fairly cheap, making them easy to implement on a large scale. Numerous pilot programs are now in place to test this technology, with promising results.

The effects of visual deterrents, like the ones provided by DataTag, should not be overlooked. In the UK, a program was implemented with VIN numbers and online registration. Bikes were marked with acid-etched serial numbers and ultraviolet ink labels, the latter being only visible via a special light. Such a program made it harder for thieves to sell their stolen bikes, resulting in a drop in bike theft of 39% (Design Against Crime Research Center, 2008). The University of Toronto also implemented this system, with similar results.

The final technology often suggested for tracking bicycles is GPS technology. However, it is not practical to implement on every bike as the technology is expensive. Therefore, it is often used on “bait bikes,” - bikes which are meant to be stolen. Hidden within are GPS transmitters which alert the police if the bike has been stolen. The police can then track the bike down and arrest the thief. The University of Toronto has implemented such a program successfully (Brichard, 2007). However, the main strength of the bait bike is not so much the GPS, but the fear of being caught. By randomly placing such bikes amongst other, untagged bikes, thieves do not know if what they are stealing is a bait bike or a regular bike. This fear discourages them (Brichard, 2007). Ultimately, the intent is to remove any temptation to steal in the first place.

The previously mentioned technologies are all designed to prevent theft by making it hard or worthless for a thief to steal a bike, but they do nothing to eliminate the reason. While all of the motivations for bike theft cannot be removed, they can be minimized. The best solution for this is a concept known as bike sharing. At a basic level, bikes are provided by the government and are available at common destinations. A person can simply take a bike, ride it to his or her destination, and return it. This is effectively renting a bicycle, but cheaper and intended for shorter periods.
Bike sharing originated in The Netherlands with the White Bike system. Bikes, painted white, were made freely available with minimal controls to monitor the program. Within two days, almost all of the bikes had been stolen, lost or otherwise put out of commission and the program fell apart (DeMaio, 2009). Denmark then seized the idea and revised it. Bikes were made available from a coin operated machine and not simply left on a rack. The bikes were also made heavy and lacked any standard sized parts to limit their value on the market, as shown in Figure 5. This program was far more successful, but had limitations such as year round availability, quantity requirements, and heavy weight considerations of the bikes (Midgley, 2009).

In the 1990’s, the 3rd generation of bike sharing was introduced. It used the newly developed “smart card” technology where a card unique to a person was used to access a bike. This allowed for the bike to be tracked and if not returned, the bike could theoretically be retrieved. This system is still in place today, but its effectiveness is limited. There are simply not enough bikes to meet current demands (Midgley, 2009). Thus, designers are looking to the future to expand and improve the system with plans to include GPS trackers on the bikes as well as improve distribution (Midgley, 2009). With the ability to track bikes, governments are more willing to make them available year round. Furthermore, demand can be tracked and bikes provided where they are most needed.

Similar systems have been implemented in Scandinavia, Germany, China, France, Italy and Spain. These programs do not directly prevent theft, but they are intended to remove the incentive. A bike does not need to be stolen if there are bicycles available freely. In turn, the demand for stolen bikes decreases, as those in need of a cheap bike are more likely to just use a city bike than buy from online. Without a market, there is no incentive to steal.

In 2005 a project was conducted on bicycle theft in Copenhagen with the goal of recommending the best possible solution to the problem. After evaluating the state of bicycle theft through observations and interviews of stakeholders, the main recommendation was for Denmark to implement an RFID system (Glynn, Houle & Schweers, 2005). From there, police would theoretically be able to easily scan bikes to see if they have been registered as stolen. There was an RFID pilot program implemented in 2008 in the city of Copenhagen where 8,000 bikes were equipped with RFID tags and tracked (Aagaard,
In one respect, it was a great success, because 10,000 people showed up to have their bikes registered. Other than the turnout though, the project was a failure and not continued. If it was a really successful technology, it would have been implemented, but it was too difficult for the police to scan the RFID tags (Aagaard, 2013). This campaign may not have been related to the recommendation of the bicycle theft project, but RFID technology was the only solution provided by the students and it has not been implemented since then. The issue of theft was approached from a technological standpoint, not a social standpoint and there was no mention of raising awareness on bicycle theft or encouraging citizens to prevent theft on an individual level.

While bike theft is a large problem, there exists a wide variety of strategies to counter it. Some are technological, from the basic bike lock to futuristic RFID and GPS technology. Others are social, which includes the bike sharing system; it will be expanded upon in the next section. Bike sharing provides easily obtainable bikes, removing both a market for stolen bicycles and a need to steal them. Other systems incorporate both social and technological features; hard to remove labels marking a bike as stolen make resale a challenge. The difficulty lies in fully implementing these solutions as well as modifying them to keep pace with the evolving problem of bicycle theft.

2.4 Bike Theft Prevention Programs

Based on programs implemented in other countries, there are a variety of theft prevention methods that are currently being tested in cities with a high rate of cyclists. A commonality among all of these programs is the coordination and cooperation of all stakeholders as well as the combination of policies ranging from new technology to public outreach. Incorporation of some of the methods listed in Table 1 has resulted in successful anti-theft programs in countries such as The United Kingdom and The Netherlands.

The methods used are varied, but come in three general categories:

i. The direct prevention of theft

ii. The involvement of stakeholders

iii. Indirect actions

Direct prevention includes the use of unoccupied surveillance vehicles and the strategic placing of bike racks. Involvement of stakeholders includes police checks and bike dealers participating in anti-theft organizations. In London, UK, a specific, online bicycle registration website makes it easy for cyclists to
register their bicycles as well as stay up to date on the state of bicycle theft in the city and the best theft prevention practices (Brown & Haliwell, 2011). London has also organized a specific cycle security taskforce as well as really incorporated the police department in elevating bicycle theft from more than just petty crime (Brown & Haliwell, 2011). Finally, indirect methods include anti-bike theft campaigns and the collection of abandoned and poorly parked bicycles. This relates more to prevention and return of stolen bicycles as opposed to directly deterring thieves.

Combinations of these methods have proven to be effective. In Portsmouth, UK, where the organization Design Against Crime has aimed to reduce bicycle theft, the rate of theft dropped 39% in the year following the implementation of anti-theft measures such as bicycle marking and police checks (Design Against Crime Research Centre, 2008). Winterswijk, located in the Netherlands, applied a similar program and was voted the best approach to bike theft by the Fietsersbond Cycling Association due to its effectiveness (Cycling in the Netherlands, 2009). These methods are new, and thus have not been fully embraced globally.

Although Denmark has successfully implemented certain anti-theft measures, there is still a lot of room for the country to improve its efforts. They do not have the best possible technology for tracking and returning bicycles, but preventing theft does not always have to involve cutting edge technology. Although the pilot programs researched are in different countries, the difficulties regarding bicycle theft and prevention are similar across cultures. Police do not regard bicycle theft as being a serious offense in both the UK and Denmark, resulting in not all incidents being reported (Design Against Crime Research Centre, 2008). Another issue is that local police departments all record bicycle theft in different manners, making analysis and standardization difficult. These common problems enable Denmark to learn from the methods other countries have established.

In Table 1 is a list of preventative methods that several cities have tried in anti-theft programs. They are listed starting from the most direct methods to increasingly indirect ones.
<table>
<thead>
<tr>
<th><strong>Preventative Measure</strong></th>
<th><strong>Function</strong></th>
<th><strong>Location &amp; Program</strong></th>
<th><strong>Effectiveness</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of unoccupied surveillance vehicles</td>
<td>Vehicles placed near high risk areas in the evenings.</td>
<td>Winterswijk, The Netherlands</td>
<td>Resulted in a significant drop in bike theft&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Strategic placing of bike racks</td>
<td>Bike racks placed in sight of doormen at clubs to ensure bikes are always monitored.</td>
<td>Winterswijk, The Netherlands</td>
<td>Effective since the doormen can always keep an eye on bike parking facilities.</td>
</tr>
<tr>
<td>Police Checks</td>
<td>Police patrol high risk areas especially at night. Perform bike engraving checks to see if stolen bikes are present.</td>
<td>Integrated Bike Intervention Program, Amsterdam</td>
<td>Involvement of police encourages public to register bikes and report theft.</td>
</tr>
<tr>
<td>RFID technology</td>
<td>RFID scanners distributed to bicycle dealers to report stolen bikes.</td>
<td>Southend, UK</td>
<td>On Going</td>
</tr>
<tr>
<td>Bicycle Marking</td>
<td>Ultra violet pens and acid etching were the marking methods used.</td>
<td>Portsmouth, UK</td>
<td>Bicycle theft dropped 39% in the area in the following year&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cycling Taskforce</td>
<td>30 officers dedicated to bicycle security distributed across London.</td>
<td>London, UK</td>
<td>5.4% decrease in bicycle theft from 2009-2010&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Free bike engravings and registration</td>
<td>Actively promotes engraving by offering engravings and registration for free.</td>
<td>Amsterdam &amp; Winterswijk, The Netherlands</td>
<td>On Going</td>
</tr>
<tr>
<td>Special Bicycle Registration Webpage</td>
<td>A webpage was designed specifically devoted to the bike registration program and bike theft issues.</td>
<td>Integrated Bike Intervention Program, Amsterdam</td>
<td>Accessible to police and public; increased amount of stolen bikes reported and returned.</td>
</tr>
<tr>
<td>Anti-Bike Theft Campaigns</td>
<td>Regular campaigns held to raise awareness on theft, provide bike locking information, and emphasize the importance of reporting a stolen bike.</td>
<td>Winterswijk, The Netherlands</td>
<td>The pilot program was voted the best approach to bike theft by the Fietsersbond Cycling Association&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bicycle Dealer Organization</td>
<td>Organization of bike dealers who do not buy, sell, or service suspected stolen bikes. Sticker placed on front door to publicize this.</td>
<td>Integrated Bike Intervention Program, Amsterdam</td>
<td>Discourages bicycle theft because it eliminates a point of bike resale.</td>
</tr>
<tr>
<td>Community Engagement</td>
<td>Organize site specific community engagement.</td>
<td>London, UK</td>
<td>On Going</td>
</tr>
<tr>
<td>Collection of abandoned and poorly parked bikes</td>
<td>Processes bikes removed from the streets and identifies and returns stolen bikes.</td>
<td>Amsterdam Bicycle Handling Centre (AFAC)</td>
<td>Around 40% of the bikes collected are returned back to original owners&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>1. (Cycling in the Netherlands, 2009)</sup>
<sup>2. (Design Against Crime Research Centre, 2008)</sup>
<sup>3. (Brown & Haliwell, 2011)</sup>
Some of these methods, such as a bicycle registration system and RFID technology have been attempted in Denmark, but not to the scale and success of these other programs. These anti-theft initiatives prove that there are still plenty of ways for Denmark to improve upon its present measures.

2.5 Stakeholders

Since cycling is such a major component of everyday life in Denmark, there are many stakeholders to be considered when regarding the issue of bicycle theft. These stakeholders vary from Danish cyclists who are directly affected by the problem, to important, all-encompassing parties such as the national government. A commonality among the previously mentioned theft prevention programs is the incorporation of all stakeholders; this has proven to be very successful. Figure 6 displays all the involved stakeholders, starting with the individual and branching up to the national government responsible for the best interests of the Danish citizens. It is organized by how directly invested each stakeholder is with regards to bicycle theft, with the individual cyclist being the most influenced by the problem.

![Stakeholder diagram]

**Figure 6: Stakeholder diagram detailing the circles of involvement**

There is an organization that represents the Danish cycling community and not only aims to promote and increase cycling, but also works in the best interests of the cyclists. The Dansk Cyklist Forbund (DCF) is a large, nongovernmental cycling organization that was founded in 1905 and a full description is located in Appendix C. It currently consists of around 18,000 members, with its main office based out of
Copenhagen. The organization seeks solutions to widespread impediments facing cyclists across the country. Some improvements endorsed or sponsored by the DCF include better-quality road conditions for biking and publicly available bike pumps and tools. Another major problem facing cyclists today that the DCF is looking into is bicycle theft. Due to its size, the organization has an influence in the political field and can put pressure on authorities to reform the treatment of cyclists.

Beyond the sphere of the DCF are bicycle shops and then police and insurance companies. Bicycle dealers are often the first place thieves go to sell or service their stolen bikes (Design Against Crime Research Centre, 2008). As such, the cooperation of bike dealers with authorities is essential to minimizing the salability of stolen bikes. From there, it falls on the police to deter and prevent theft. The police hold a lot of power in enforcing theft prevention measures that could drastically reduce the rate of bike crime. If the police work on catching and punishing thieves, it is likely this would decrease the rate of theft through the fear of being caught. Additionally, insurance companies working with the cyclists via their bike coverage policies can have an impact on the number of stolen bicycles reported. By ensuring all bikes are registered in a database in order to be insured, it would make bicycle tracking and recovery easier.

Holding the power over all the other stakeholders is the national government, which includes city planners, transportation authorities, and lawmakers. They have the ultimate authority of passing laws and regulations to discourage bicycle theft and setting measures for catching and punishing thieves. The government has the ability to elevate this problem and ensure all stakeholders are involved in the effort to find solutions. As shown in the previous section, the most effective solutions are the ones where the most stakeholders are involved. The complexity of this issue means that it simply cannot be solved by any single party or method.
Chapter 3: Objectives

This project is intended to assist the Dansk Cyklist Forbund in understanding the present state of bicycle theft in Copenhagen and to evaluate potential solutions by researching trends in theft and prevention in the context of stakeholder interests. To achieve our goal, we have the following objectives:

1. Research and characterize the state of bicycle theft in Copenhagen.
2. Identify and understand stakeholders’ interests and perspectives.
3. Evaluate the effectiveness of current measures in place for theft prevention and bicycle return.
4. Recommend short and long term strategies to reduce the bike theft problem in the city of Copenhagen.
Chapter 4: Methodology

To delineate our approach, we developed a methodology as displayed in Figure 7.

**Objective 1:**
Research and characterize the state of bicycle theft in Copenhagen.

- Interview DCF
- Online Research
- Interview Police
- Interview Municipalities

**Objective 2:**
Identify and understand stakeholders’ interests and perspectives.

- Interview / Survey Danish Cyclists
- Interview Insurance Agency
- Interview Bike Dealers

**Objective 3:**
Evaluate the effectiveness of current measures in place for theft prevention and bicycle return.

- Passive and Active Observations
- Online Research
- Interview Municipalities
- Interview Tech Companies

- Interview Foreign Anti-Bike-Theft Organizations
- Discuss feasibility of potential solutions in Copenhagen
- Analyze all data

**Objective 4:**
Recommend short and long term strategies to reduce the bike theft problem in the city of Copenhagen.

*Figure 7: Flow chart of methodology*
4.1 Understanding the Impact of Bicycle Theft and Anti-Theft Measures

One of the first questions we sought to answer at the start of this project was “What is the state of bicycle theft in Copenhagen?” To address this question, we conducted a series of interviews, both by email and in person, with our project sponsor, a member of the Danish National Police, and representatives of several Danish municipalities. The following questions were asked during our first conversation with our liaison Mr. Jakob Madsen and subsequent interviews with other DCF members, all of which can be found in Appendix A:

- Do you have access to any recent data and research already conducted on bicycle theft in Copenhagen?
- What is the involvement of stakeholders such as the Copenhagen police and insurance companies with respect to this problem?
- Why is bicycle theft a problem right now and is there a specific reason we are being asked to research this issue?

A prime component of our objective was to determine the degree to which organized bicycle theft exists and the potential for its escalation, therefore making the Danish police a key informant in this area. It was of significant value to categorize and examine the motives, geographical distribution and demographics behind theft. By inquiring about current trends in theft and high risk locations, we hoped to gain valuable information that could only be provided quantitatively by the police department. With the police, we aimed to better understand the crime, culprits involved, and investigative procedures. After numerous attempts ourselves, a meeting was arranged through Mr. Jakob Madsen. The following questions were asked as a part of the interview.

- How often do you receive bicycle theft reports?
- Do you feel that there have been any shifts in motives for theft, specifically towards organized crime?
- Have you mapped out theft incidents by location and seen any patterns or trends in the data?
- What are currently the biggest challenges in bike theft prevention and how would you like to see those challenges overcome?

To understand the state of bicycle theft nationwide, we contacted 15 different municipalities around Denmark, chosen based on their membership in the Danish Cycling Network, to obtain their feedback on
the issue and their cities’ experiences and responses. Of these 15 municipalities, eight replied. We asked the following questions to all of them.

- How prevalent is bicycle theft in your area and do you have any ideas on how to reduce theft, return stolen bikes, and help with the problem of theft in general?
- Have you taken any actions to try and reduce the problem in your region?

Challenges and limitations to these methods were inevitable during our research and a major point of caution was the influence of bias amongst both our sources and the manner in which the questions were posed. As personal opinion can present a risk to the validity of an informant’s claims, the interview questions were carefully thought out and worded in a manner that was as unbiased as possible. Our methods were executed with great care and attention to neutrality, specifically with the police, so as to not skew information and interpretations.

4.2 Identification of Stakeholder Interests

Once we had interviewed the DCF and conducted our field observations, detailed later, we felt we had obtained enough information to begin interviewing bicycle dealers, cyclists and Forsikring og pension, an organization representing a collection of Danish insurance agencies, for their perspectives. The main questions we sought to answer were:

- What are the experiences of individual cyclists with respect to bicycle theft and how does it affect their lives?
- How often do bicycle dealers encounter stolen bikes or customers looking to replace a stolen bicycle and what are the procedures for authenticating and registering bikes?
- What are the policies for insuring bicycles?
- Do the insurance companies have any data regarding bicycle theft trends and locations?
- What would you like to see done in regards to this issue?

The easiest way to reach the most cyclists was via a survey. Conducted both online through a form on Google Docs posted to the DCF Facebook page, and in person at the DCF’s storefront, an understanding of cyclist behaviors and viewpoints was achieved. After the professional translation of our sponsor, we obtained the input of 122 cyclists; a number that was two and a half times higher than our original goal of 50 respondents. We were aware that conducting the survey through the DCF may have induced a bias in the responses, as those who followed the Facebook page likely were more active cyclists than the
average Dane. However, it was found that there were trends in the data which matched our other sources; consequently, the data was assumed to be at least partially representative. The purpose of this survey, a copy of which can be found in Appendix B, was to understand how cyclists deal with theft and what anti-theft measures are taken on an individual level. Some of the main questions listed were:

- Have you ever had a bike stolen?
- How often do you use a lock? What type(s)?
- How often do you use bike parking? What are your issues with it?
- If you have ever stolen a bike, why?

We also attempted to conduct cyclist interviews at Østerport Station, but found that the questions we could ask in the short amount of time each cyclist had available were not enough to obtain anything different than what the survey had already revealed to us. Thus, we did not conduct many cyclist interviews, and the limited data only supported what was gathered from the survey. As a result, we learned nothing new.

To record the perspective of local bike dealers, we interviewed various shop owners around central Copenhagen. We spoke with dealers that sold new bikes, used bikes, and a mix thereof. The main questions asked were:

- What types of bikes do you sell?
- If you purchase used bikes, where do you purchase them from?
- What do you do if someone tries to sell you a stolen bike?
- What trends do you notice among your customers regarding stolen bikes? How often are they replacing stolen bikes and does the fear of theft affect their purchases?

While our original plan called for 10 interviews, we ultimately conducted seven after trying a total of 10 dealers. The remaining three were unable or unwilling to speak with us. We concluded that these seven interviews were sufficient since the dealers provided the same information and were of similar opinions.

The last stakeholder we spoke with was Mr. Ricardo Pescatori of Forsikring og pension, an organization which represents numerous insurance companies. This gave us a collective perspective of their interests. In preparation for the interview, we sent him our questions, the main points of which were:

- What are the current bike plans and the policies for payouts?
• What would the insurance companies like to see with bike theft?
• What are the insurance companies willing to do?

Once all of the stakeholders were contacted, we were able to analyze the various methods in place for bicycle theft prevention in Copenhagen. We assessed them based on what each stakeholder was looking for in a solution and the level of effort they would be willing to contribute.

4.3 Evaluation of Current Prevention and Recovery Methods

Before developing solutions to bike theft, we had to first determine what actions had already been taken in Copenhagen. Answers were sought to the following questions:

• What measures, such as bike locks or VIN numbers, are in place to prevent theft and how effective are they?
• How, if at all, are stolen bikes tracked and then returned to their rightful owners?
• What measures could be potentially implemented?

At this point, many of these questions had partially been answered through observations at train stations and in speaking with the various parties involved. Our observations were simple, aiming to answer how many bikes were unlocked versus locked and what, if anything, they were locked to. Additionally, we looked for signs of theft – broken locks, stripped bikes, or similar. Due to the fact that these observations involved checking individual bikes and recording notes, activity similar to professional thieves, this aroused the suspicions of nearby Danes as they had no knowledge of the purpose of our actions. Interestingly, it taught us that the Danes do pay attention to suspicious activity. Curiously, once we were wearing DCF branded high visibility vests, we were able to walk about without raising concern.

We also emailed numerous companies to discuss what they offered with regards to bike registration and tracking and how effective they felt it has been. These companies included QR code based registries such as Deeple, Taglock and Immobilise and a wireless network based tracking company called Diims. The main questions asked were:

• What is the application and effectiveness of your product, specifically related to bicycles?
• Do you have any data on the success of your product?
• Do you have plans to expand your bike tracking market and would you be interested in collaborating with other stakeholders to help reduce the problem of bicycle theft?
We spoke with the director of the DCF regarding an agreement the organization has with Falck, a major, international company that provides an online database for registering and recovering stolen bikes. The goal of this interview was to understand this new initiative to actively reduce theft, especially because it did not involve any government agencies. Finally, we interviewed Mr. Peter Aagaard of Hviscykel, a free, community-based bike registry program. While Falck provides stickers to visibly mark registered bikes, Hviscykel focuses on the social aspect and promotes the idea that theft is everyone’s responsibility. Since a major part of our proposed solution involves social awareness, we made a point to discuss the feasibility and potential impact of our deliverables with him.

4.4 Discussion of Theft Reduction Strategies
Our final objective was to evaluate emerging anti-theft technology and strategies to determine what can and cannot be implemented in Denmark. We discussed our plans with the various stakeholders to gain their feedback.

Our goal was to have both short and long term solutions, ideally in a comprehensive plan, to deal with bike theft. In order to accomplish the creation of this plan, we contacted various foreign anti-bike-theft organizations. We had looked to understand the logistics and difficulties they faced with their strategies. However, we never received responses to our questions, and thus had to explore other sources. Therefore, we conducted research on what had already been tried in Copenhagen. This information largely came through Mr. Peter Aagaard, who had already conducted similar research in creating Hviscykel.

To understand possible challenges, our other source was the Danish municipalities. Unfortunately, since many of these municipalities had either not implemented any strategies or their programs were brand new, we were unable to receive clear details on the difficulties or successes of their efforts. Thus, we talked with the companies they used in order to understand what it would take to implement similar programs in Copenhagen.

Once we had this information, coupled with understanding both the present state of theft and the interests of the stakeholders, we were able to develop a detailed plan for dealing with theft. This plan was designed to flow logically, with each suggestion laid out in the order it should be implemented,
starting with solutions that can be completed at the termination of the project, extending to three to six month solutions, and ending with a year or more.
Chapter 5: Results and Analysis

The information gathered regarding stakeholder opinions, the data on bicycle culture, and finally theft, can be divided into three main sections to be analyzed: the current state of bicycle theft in Copenhagen, the stakeholder perspectives, and theft prevention initiatives that are either underway or have already been attempted. These findings are the result of fieldwork, interviews, surveys, and literature research. The analysis of this data will supply the basis for our conclusions in Chapter 6 and recommendations in Chapter 7.

5.1 The State of Bicycle Theft

The first objective of the project was to conduct enough research between literature reviews, interviews, surveys, and observations to compile a report on the state of bicycle theft in Copenhagen. This was one of the main requests made by the DCF.

In an email correspondence with Mr. Henrik Christoffersen, from the Traffic and Road Administration of the Municipality of Middelfart, we received data detailing the number of bicycle thefts in each of the 98 Danish municipalities, as well as Denmark as a whole. This information was retrieved from “Danmarks Statistik,” an organization dedicated to collecting, compiling, and publishing statistics on Danish society (Danmarks Statistik, 2013). This dataset spanned from 2007 until 2012. Figures 8 and 9 depict the number of stolen bicycles reported to the police in Copenhagen and all of Denmark from 2007 to 2012. Both the city and the country follow similar trends, peaking in 2009, possibly due to the financial crisis at the time. Many people were in need of money and were more likely to steal a bike, whether for

![Figure 8: Bike thefts in Denmark](image-url)

![Figure 9: Bike thefts in Copenhagen](image-url)
transportation or to sell. Unfortunately, such motives are purely speculative and cannot be confirmed by the data.

The statistics for Copenhagen indicate an average increase of 2% per year for the past five years. Despite this, one cannot actually deduce that theft is truly increasing as the data is not sufficiently linear to draw such a conclusion. In 2007, 17,777 bikes were stolen and this number increased until 2009, when the number of thefts peaked at 21,841. Since then, the level has dropped and remained relatively constant. The present rate of theft corresponds to 55 bikes per day being stolen in Copenhagen and nationally a bike is stolen every 7 minutes.

The data also shows that Copenhagen has the highest rate of theft for any municipality. The theft rate was, on average, 3.4 times higher than Århus, the second largest city, and 4.3 times higher than Odense, the third largest city in the country. Looking at population size, Århus has half the population of Copenhagen and Odense has a third of the population (Danmarks Statistik, 2013). This would indicate that bike theft does not scale linearly with population, but rather a denser population results in an exponentially increased rate of theft.

The dataset also showed that theft is not constant throughout the year, as displayed in Figure 10. Averaged from 2007 to 2012, bike theft is lowest in the winter and fall and highest in the summer, during which a third of all theft occurs in Copenhagen. The weather during the spring and summer is more conducive to cycling and thus there are more bikes on the road. The end result of this is that there is both an increase in demand for, and supply of, bikes.

![Figure 10: Bike theft by season](image)

After contacting Mr. Ricardo Pescatori, a consultant for Forsikring og pension, a trade organization for Danish insurance companies, we were supplied with the yearly data regarding claimed bicycles for insurance companies from 2004 to 2012. The monetary value of a stolen bike in 2012 was averaged to be around 4,214 DKK (737 USD). This is a significant amount of money for the average citizen, but bicycle theft is still classified as petty theft by the police. Continuing along this line of thought, the
average value from the insurance companies was taken for each year from 2007 to 2012, and then multiplied by the number of reported bikes stolen, to return the average annual monetary value of stolen bicycles in Copenhagen and in Denmark. This can be seen in Figure 11.

Although the number of reported bicycles peaked in 2009, the average payouts have been steadily increasing for bicycles. In 2007, the average payout for a stolen bike was 2,570 DKK (448 USD). In 2012, it was 4,214 DKK (737 USD). For Copenhagen, this translates to the average annual monetary loss reaching a maximum in 2012 at 84.5M DKK (14.8M USD). Nationally, stolen bikes cost over 290M DKK (51M USD). It can be said that bike theft is a significant monetary drain on the Danes and is likely to continue to worsen.

A different perspective on the issue can be found by comparing the number of thefts reported to the police versus the number of stolen bike claims made to insurance companies.
Table 2: Stolen bikes reported verses claimed in Denmark

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2007</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td>Reportd (# of bikes)</td>
<td>67,505</td>
</tr>
<tr>
<td>Claimed (# of bikes)</td>
<td>49,452</td>
</tr>
<tr>
<td>% Claimed</td>
<td>73%</td>
</tr>
</tbody>
</table>

The rate of bike theft claims is steadily increasing, which is likely the result of a push by insurance companies. Bike theft plans are often wrapped into home insurance plans as a way to promote these coverage policies. This results in more people having bike insurance, and therefore more people able to claim compensation on a stolen bike. While the past two years are not quite sufficient to establish a trend, it does appear that there is a ceiling of about 80% of stolen bikes being claimed. The survey we conducted, which will be explained in greater detail in the next paragraph, helps to support this value. One of the questions asked was if Danes record their bike chassis number, which is required to claim insurance. Of the responses, 84% said yes. If we assume that the survey is representative, the maximum percent of claims is only going to be around 80%, and it can be concluded the other 20% either did not have the chassis number or were not insured.

In order to understand the prevalence of bicycle theft and analyze what individuals do to protect their bikes, a survey of a small subset of the Danes was conducted. This survey was distributed at the DCF shop front as well as on the DCF Facebook page; it returned 122 responses, which is a larger sample size than the initial goal of 50. It was translated to Danish for distribution, but an English version is located in Appendix B for reference, which includes a more detailed summary of the responses. The sample consists mostly of cyclists since it can be assumed a majority of the respondents are DCF members. Therefore, this sample cannot be taken as a completely accurate representation of the Danish population, but it is still a great source of basic information.

Looking at this sample, 47% of the respondents cycled 7 days a week and 96% said they always locked their bike for protection. Despite this high percentage of cyclists who locked their bikes, 75% said they have had at least one bicycle stolen, meaning theft is definitely a serious problem. In the distribution of
locks, there was no connection found between the amount of locks used and whether or not that individual had a bike stolen. Of the respondents, 60% used one lock and the other 40% used multiple. The exact distribution of locks is included in Figure 12.

![Figure 12: Breakdown of single lock usage](image)

Ring locks made up half of the single locks used, which was also noted in passing observations. The second most common lock reported was the U-lock, although the survey indicated more were used than seen in observations. This may be the result of confusion over the different lock types, or it may indicate some bias in the survey. Those who responded are more likely to care for their bikes, and therefore willing to use a heavier, more secure lock. When it came to using multiple locks, the most common combination was a U-lock and a cable lock. A breakdown of multiple lock usage rates is included in Figure 13.
Observations recorded at the parking facilities of major train stations in Copenhagen also confirmed the frequent use of locks. These observations were performed at seven stations within central Copenhagen as displayed on the map in Appendix D. Over 900 parked bicycles were observed in these parking lots and only three bicycles were not locked in any manner. Although many were not locked to an object, almost all were locked with a simple ring lock on the rear wheel. This suggests the Danes take care to ensure there is at least one theft preventative measure in place before leaving their bicycle parked in public.

Although almost all of the bicycles were locked, many were not parked properly or locked securely to a fixed point. It was observed that between the seven stations, approximately 25% - 50% of the bikes were not parked correctly within the designated parking areas due to a lack of sufficient parking spaces, as shown in figure 14. Despite the fact that only seven stations were observed, it can be assumed that parking in general, especially at high traffic areas such as train stations, is not sufficient. This statement is supported by data from our survey conducted where only 12% of respondents always used designated bicycle parking if provided and the most common problem cyclists had with provided parking was an insufficient number of spaces.
During observations, it was proven that people are aware of bicycle theft because we were stopped and asked our purpose in observing bicycles, since it is thought that Eastern Europeans walk along bike racks tagging specific bikes to be stolen later on. In many of our interviews, which are all located in Appendix A, most Danes cited the one incident in 2012 where 12 Lithuanians were arrested for stealing bicycles in bulk. Everyone seems to be very aware of this incident and also extremely eager to place the blame on Eastern Europeans stealing mass amounts of bicycles and shipping them out of the country.

Our research has indicated that the existence of these gangs may be greatly exaggerated. Two interviews, one with Ms. Christina Britz of the DCF and the second with Ms. Mahina Baker of Baisikeli implied that the issue was far more local. They both were acquainted with Danes who simply stole bikes for a ride somewhere. These thieves did not see a problem with taking an unlocked or poorly locked bike. Additional evidence to support this theory came from Vicepolitiinspektør (Deputy Chief Superintendent) Henrik Framvig of the Danish National Police, who stated that he has not seen an increase in activity from such gangs and while they do steal bikes, they do not constitute the majority of thieves. His idea is that most theft is still the result of Danes simply needing a ride to and from somewhere and stealing a bike is the easiest way to accomplish this. He was unable to provide numbers, but feels that theft for this reason greatly outnumber steals selling for a profit, either by individuals or gangs. Based on the testimony of multiple interviewees with our own observations, we ultimately feel that theft is still predominantly an issue with individuals.
Given this data on the state of bicycle theft, and now that an understanding of the issue in Copenhagen has been reached, one must understand the opinions of the assorted stakeholders before a plan to combat the problem can be developed.

5.2 Stakeholder Opinions

In order to fully understand bicycle theft and how it is regarded in Danish society, the perspective of the stakeholders involved is vital. This was accomplished by contacting the following parties, the viewpoints of which are summarized in Table 3. Speaking with these stakeholders helped us gain an understanding of who wants to see a change in the current situation and how much effort individual stakeholders would be willing to contribute in order to solve the problem.
Table 3: Stakeholder perspectives regarding the present and future

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Current Involvement</th>
<th>Future Involvement</th>
</tr>
</thead>
</table>
| Danish Cyclists                    | • 96% always lock their bikes  
• Purchase lower quality, cheaper bikes to minimize loss if stolen                                                                                                                                             | • Police to take action on the thieves, better enforcement  
• See other stakeholders become more involved and begin to develop solutions |
| Dansk Cyklist Forbund              | • Program with Falck allowing DCF members to register their bicycles for free                                                                                                                                           | • Stakeholders to become more involved in working together on this problem.  
• Individuals to feel comfortable purchasing high quality, expensive bikes  
• Preservation of Danish bicycle culture |
| Insurance Companies                | • Use bike coverage policies as incentive to attract customers by combining it with home insurance policies.  
• Paid 233M DKK (41M USD) in 2012 in bike compensation.                                                                                                           | • Interested in solving the problem, but will only support a solution when it is proven to be effective.                                                                                                          |
| Bicycle Dealers                    | • Do not purchase bikes from suspected thieves  
• See customers coming in to purchase cheaper, low quality bikes out of fear of theft. Around 50% of customers are replacing a stolen bike.                                                                 | • Open police database to the public  
• Improve the quality and size of public bicycle parking                                                                                                  |
| Involved Businesses                | • Hviscykel.dk – bike registration site for bikes in use, lost, found, and for free  
• Falck – Agreement with DCF  
• Deeple, Diims, and Immobilise have bicycle databases and tracking technologies  
• TagLock is the company working with 2 municipalities on tracking residents’ bikes  
• Hviscykel.dk - create a community network and revive the bike as a part of valued Danish life. Incorporate bike dealers as the “hubs” or centers of all transactions.  
• Deeple - expand bicycle registration program  
• Immobilise - interested in expanding bike tracking program in Denmark if police are willing to collaborate  
• Diims - willing to work with the DCF |
| Danish Municipalities              | • Aarhus and Frederikshavn – launched TagLock programs  
• Hvidovre, Middelfart, Frederiksberg, Randers, Skanderborg, and Gladsaxe do not know the state of bicycle theft and have taken no action.                                                                 | • More action should be taken by the police.  
• Better monitored, covered, and more secure public bike parking.                                                                                           |
| Police                             | • Do not devote significant resources to bike theft  
• Acknowledge it is an issue, but have higher priorities                                                                                                                                                  | • In the process of making the police database publicly accessible                                                                                      |
5.2.1 Danish Cyclists
Between the results from observations, surveys, and individual interviews, an understanding of how the average Danish cyclist views bicycle theft was developed. As mentioned earlier, observations of high traffic parking areas were conducted in order to see how often bikes were locked, and in what manner they were parked. It was determined that almost all Danes locked their bike with at least one form of lock. Additionally, it was found that the provided parking was insufficient and could not handle the number of bikes. Anywhere from 25-50% of all the bikes were not parked in a rack.

Returning to the survey of Danish cyclists, there were three short answer questions which were intended to give a better idea of the respondents' opinions on bike theft. They were as follows:

- What other measures do you take to secure your bike?
- If you have ever stolen a bike, what were your reasons?
- Do you have any additional comments?

There were a variety of answers to the first question, but they mainly centered around three themes. The first was locking a bike to something fixed and rigid, such as a fence, a post, or a bike rack, often inside a building where the bike could not be easily accessed. The second was leaving the bike somewhere out in the open and obvious, where a thief could not easily steal it without being noticed. The effectiveness of this strategy is debatable. The final idea was to simply not have a bike worth stealing. Many admitted to intentionally not maintaining their bikes so they were not targets for thieves. The vast number of responses indicated that many people do at least make some effort to protect their bike.

The second question provided great insight into how most Danes regard theft. While a number did say they would never steal a bike, 8% of respondents admitted they had. Most attributed their actions to being intoxicated, young, or both. Others said that they did not, technically, steal the bike since it was unlocked. This is an important observation since it highlights the fundamental problem with how society views bike theft. It supports the social shift that is necessary in the first steps to solve this issue. Another respondent said they simply needed to replace a bike of theirs that had been stolen and they did not have the money. Other responses included needing to pick up a pizza and another needed a ride to the hospital, but put the bike back later.
The conclusion from these responses is that, while Danes know theft is an issue, it is a fact of life and they have come to accept it. This idea is supported by an interview with Ms. Mahina Baker, a non-native resident of Copenhagen, who believes that people are very unconcerned about bicycle theft beyond their own bikes. People have begun to accept it by purchasing low quality, cheap bicycles in the hope that they are not stolen in the first place, and if one is, it is not a large monetary loss. The Danes have also embraced how straightforward it is to claim compensation for a stolen bike from the insurance companies. A few years ago, this process used to take two to three weeks, but it now takes roughly two or three days. This makes it very easy to obtain a new bike quickly, making theft more of a hassle than a serious event.

The insurance companies have made the process for claims of stolen bikes very simple. Of our survey respondents, 86% could say where they kept their receipts and other paperwork to claim insurance on a stolen bike; some with great precision. Those who do not keep record likely do not have insurance, or their bike is old enough not to warrant claiming. A very small portion of respondents take care to not leave their bike in areas where it is likely to be stolen, thus they did not feel insurance was needed.

The final question, asking for additional comments, included a wide variety of responses. Some were complaints, often just relating to people stealing bikes or the lack of a response by the police. A number pushed for better, easier-to-lock-to bike parking. One pointed out that the fine for stealing a bike, 2000 DKK (350 USD), was not enough of a deterrent, especially since this is less than half the average value of a stolen bike. However, the most common idea was that despite people’s best efforts, many bikes are still stolen, and no amount of locks seems to help.

The attitude of the Danes was summed up very well in an interview with Mr. Peter Aagaard, creator of the bike registry website called hviscykel.dk. Peter Aagaard stated that Denmark seems to have the mentality that bicycle theft is not a home grown problem. They blame it on Eastern European gangs entering the country and stealing bicycles in bulk and the police for not enforcing the law and taking enough interest in the problem. Essentially, all parties are blaming one another, and no one is taking the initiative. The average citizens do not realize the power they hold as a part of solving the problem. An effective solution will likely arise when the Danes begin to make an effort to resolve this issue on an individual level, meaning this should be the primary focus of any anti-theft measures.
5.2.2 The DCF

The DCF is one of the main stakeholders pushing for a solution to the problem of bicycle theft. In a meeting with Mr. Jens Loft Rasmussen, the director of the DCF, we were provided with an insight into where the DCF stands on this issue. This included the ultimate end goal the DCF has in mind for the citizens of Copenhagen. This goal is to have the greatest number of people cycling, on as good, high quality bikes as possible. To accomplish this, DCF aims to ensure all bikes are protected through minimizing theft and ensuring abandoned bikes are collected.

Jens Rasmussen fears Danish cycling culture is trending towards the purchase of low quality, cheap bicycles due to the prevalence of theft. Professional criminals, in particular, target high quality bicycles which discourages cyclists from purchasing those bikes. He fears Copenhagen will reach a state of crime where people are not comfortable locking their bikes outside anymore. Finally, it is important that the citizens of Copenhagen realize theft is a problem that can be solved, not one that must simply be tolerated.

To help combat this issue, the DCF has signed an agreement with a company called Falck (Falck: Mission & Vision, 2013) that provides a registry and theft deterrent stickers for bikes. Additionally, they will automatically report theft to insurance companies and the police. Falck is a large company, and although bike tracking is only one service provided, they nonetheless have the technical capability to support such a registry. This agreement gives DCF members both the incentive and ability to take action against crime. The DCF has signed this agreement since they have not made any progress with other stakeholders, such as the police and insurance companies, in efforts to reduce theft. However, they are still looking for other options.

5.2.3 Insurance Companies

The interview with Mr. Ricardo Pescatori of Forsikring og pension provided insight into the position of insurance companies regarding bicycle theft. These companies divide theft into multiple categories, as defined below.

- **Robbery** – classified as breaking and entering; or any other forceful manner of entrance and theft of property. Jewelry and money lost in this manner are covered.
- **Vandalism** – any act designed to damage, deface or destroy property.
- **Simple Theft** – classified as no forceful entry. This includes leaving a door unlocked or property unattended. Jewelry and money lost in this manner are not covered.
- **Bike Theft** – stolen bicycle. The bike is only covered if it was fitted with an approved lock and both the chassis and lock numbers are provided.

- **Mugging** – he loss of property in person including mugging, purse snatching or other similar acts.

The first information obtained from the data provided to us was that bike theft was the third highest cost for insurance companies. The exact breakdown is shown in Figure 15.

Numerically speaking, in 2012, bike theft accounted for a total cost of 233M DKK (41M USD), precisely 10.22% of total payouts. Prior to this, the percentage varied between 8 and 9%. The year 2012 had the highest value of bike theft payouts, followed by 2011 and then 2009. Of additional interest, 2009 had the highest value of payout for robbery, which supports the theory that the spike in bike thefts that year was economically motivated. Despite the amount of money paid in compensation, it is not a major concern for insurance companies. This is because a bicycle coverage policy is ultimately an addition to larger coverage policies and helps to attract customers, while not being a large company expense.

The conclusion that can be drawn from this analysis is that bike theft is not a significant portion of the payouts insurance companies have to make, thus there is not a large economic incentive for them to change the current situation. Mr. Ricardo Pescatori stated that insurance companies would like to see a reduction in bike theft, but they would not be willing to support any efforts until they know it would be a successful solution.
5.2.4 Bicycle Dealers

Seven bicycle dealers located in central Copenhagen were interviewed to gain an understanding of how bicycle theft affects them and what they would be willing to do to help prevent it. The full details from the interviews are located in Appendix A.

Multiple dealers stated the percentage of customers purchasing a bike to replace a stolen one was between 40%-60%, average around half. This number is only based on customers who mention they are replacing bikes and therefore, the real number could be higher. This is proof that theft is very prevalent and even the dealers hear about it. It is also common for customers to be more interested in cheaper bicycles, especially if they have lost multiple to theft, since they do not want to make such a large investment on something likely to be stolen.

When asked if they had any suggestions or if there was anything they would like to see done regarding theft, multiple owners mentioned having the police registry open to the public. This would be useful because the stores would feel comfortable purchasing used bikes from individuals since they could easily check to see if the bike was reported stolen. Other suggestions included improved bicycle parking, more frequent abandoned bike cleanup, and more frequent police checks. Unfortunately, they did not mention anything they themselves could do to help prevent theft.

5.2.5 Involved Businesses

There are many businesses, ranging from established companies such as Falck, to start up community websites like Hviscykel that all have the potential to help reduce bicycle theft in Denmark. Falck is an international business that works broadly within the fields of assistance, rescue, healthcare and safety training (Falck: Mission & Vision, 2013). The DCF has established an agreement with Falck to provide DCF members free use of the Falck Cykelregister. The motivation for Falck is to gain more customers for its other products by increasing brand exposure, as well as expand its bicycle registry database. Theoretically, this database could at some point in time be analyzed to better understand theft patterns.

Other relevant tracking and registry companies include Deeple, Diims, Immobilise and Taglock. Deeple is a startup company, focused on QR code based tracking, with a limited user base in the bicycle segment, but the company expressed interest in collaborating in an anti-bike theft project or campaign. Although a young company, they recognized the area of bicycles as being very relevant to the business.
Diims is a company that offers battery operated tracking devices and it has already had a tagging and tracking system established for bicycles as well as anything else the customer wishes to track. They estimate several thousand bikes are currently tracked using Diims technology. Although there is no bicycle specific data, around 88% of all units sold are “seen” by the network on a daily basis, which means that should the program be more widespread, it would not be unreasonable to expect decent recovery rates from it. The company also stated they would be more than willing to collaborate and be a part of a campaign to reduce theft.

Immobilise already has a very successful registration system implemented in the United Kingdom, with the effectiveness being credited to the support of the police and advertising to the general public. The company expressed an interest in expanding such a successful model to Denmark if they were to be approached by the Danish police or government.

Taglock is an additional QR code based tracking company. A sticker, with a 2 dimensional barcode linked to an online profile, is placed on a bike or other object. The sticker can then be scanned by smartphones or TagLock scanners and the status of the object can be viewed. If the object has already been marked online as stolen or lost, the scan will produce this information. This will allow for the owner of the object to be notified and ultimately have their property returned. Of these companies, Taglock has seen the most use as two different municipalities have starting using their technology to combat the problem of theft. This is detailed more in the following subsection.

Another organization contacted is an online registration site for lost, found, and free bicycles called Hviscykel, or “Whose Bike” in English. The main goal of Hviscykel is to promote a healthy cycling culture with respect to sustainability in Denmark (Hviscykel.dk, 2012). They aim to make it unpopular to commit a crime and reduce theft by proactively increasing the risk of being caught. The founder, Peter Aagaard, hopes to establish a form of community-based insurance for bicycles that really makes the citizens of Denmark think about the lifecycle of the bike and for individuals to take the challenge of bicycle theft upon themselves to solve.

Peter Aagaard strongly believes in a social solution to the problem of bicycle theft and hopes to be able to promote this community insurance, to the point where stolen bikes are both found and recovered by communities without the need for local law enforcement. Individuals will take a personal interest in
looking through lost and found bikes to assist with tracking and recovery. Not only will this help deter thieves, but it will also help to reduce the waste of abandoned bicycles. This site encourages recycling these bicycles through multiple owners and helps to track the different stages in the bicycle lifecycle.

Through the variety of technologies and businesses available, it is possible for the many stakeholders to easily collaborate and tackle bicycle theft.

5.2.6 Danish Municipalities

Many Danish town and city municipalities were contacted in order to gain the perspective of the local governments on the issue. The regions can be seen in Appendix E. Of the 15 municipalities, eight replied and only two, Aarhus and Frederikshavn, had implemented a program to help reduce theft. Both initiated a program where TagLock stickers were distributed to residents. The codes were linked to the owners of the bikes. Unfortunately, these systems are relatively new and no data as to the success of the trials has been collected.

Regarding the other municipalities, we contacted city planners and transportation authorities and none of them had a grasp on the state of bicycle theft in their region or any intentions to make a concerted effort on the issue. Hvidovre, Middelfart, Frederiksberg, Randers, Gladsaxe, and Skanderborg did not seem to take much interest in the problem. This unconcerned mentality regarding bicycle theft is seen at the political level of the municipalities as well as reflected in the attitudes of the citizens. Thus the main conclusion that can be drawn is that the different municipalities are no further ahead on the issue of bike theft than Copenhagen.

5.2.7 Police

In an interview with Vicepolitiinspektør Henrik Framvig of the Danish National Police we gained substantial insight into where the police stand on the issue of bicycle theft. The full details of this interview are summarized in Appendix A.

He admitted that the police do not devote many resources to bike theft, a fact which many Danes attribute to the high rate of theft. However, Henrik Framvig believes the problem lies with the mentality of the population. He believes the public views a stolen bike as simply an opportunity to purchase a new bike. This is because insurance companies have made the process of receiving compensation for stolen bikes very easy, mostly as a way to compete with the other insurance companies. This mentality
implies that the police do not devote much effort to bike theft, as there is not enough pressure to do so and there are far more pressing policing problems to be dealt with.

In addition to the actions of the police, Henrik Framvig reinforced some of the facts regarding theft in Copenhagen and Denmark at large. Although there have been multiple instances of Eastern European gangs stealing bikes in bulk, this does not constitute the bulk of thieves. It is also neither a new nor increasing trend. As others indicated, the majority of the thieves are individuals. Additionally, he also stated the train stations are the main areas for theft.

Regarding the police VIN registration system, there is a project team working on making it accessible to the public. This will not be seen for another year at a minimum due to the current economy, but there are plans to enable the average citizen to call a number and instantly know the status of the bike in question. Henrik Framvig would ultimately like to expand the database to register all bikes, not just bikes that have been stolen.

In summary, the police admit that bicycle theft is a problem, but believe the real issue lies with the insurance company policies and the attitude of the Danes.
Chapter 6: Conclusions

From our combined research and detailed literature review, the following numerical facts can be established:

- 70,000+ bikes are stolen every year in Denmark
- Only 75-80% of stolen bikes are claimed to insurance
- The rate of bike theft in Copenhagen is steady
- 75% of Danes have had at least one bike stolen
- The average value of a stolen bicycle is 4,214 DKK (737 USD)
- Bike theft consists of around 10% of insurance company compensations

The first conclusion is that bicycle theft is largely the result of individual Danes stealing bikes. The motives behind this are, in most cases, trivial such as needing a ride. Due to the economic issues over the past few years, it is reasonable to assume that those individuals stealing to make money have increased in number, but they are not a large portion of the problem. It is also our understanding that organized gangs are no more prevalent now than they were in the past, and do not contribute to a large portion of theft. While they do steal bikes, their impact has been exaggerated by significant news coverage over the past year.

It is our second conclusion that the main source of the problem is the attitude of the Danish society as a whole. The many involved parties are more interested in placing the blame on someone else instead of taking the initiative to solve the problem. This is most endemic in the cyclists themselves, who have grown so used to the status quo they do not realize they have the power to change it. Most feel that such measures are beyond their ability, or feel that the relative ease of obtaining a new bike is not worth the effort of fixing the fundamental problem. It is unlikely anything will change until this attitude is altered.

The third conclusion from our data is that the present infrastructure is insufficient, and therefore a technological based solution would not be effective. The main issues with the current infrastructure is that the bike parking facilities are neither sufficient in quantity nor of an effective design. The former can be solved through adding more parking and a more frequent bike collection system. The latter can be solved through a redesign of the present racks. Such measures would make bikes harder to steal. The other aspect of the infrastructure issue is that there is no publicly accessible database for stolen bikes.
The present stolen bike registration system is restricted purely to the police. The most effective technological solution would incorporate the use of such a database, and is therefore not a realistic solution at the moment.

Ultimately, the social issues listed in the second conclusion should be the primary focus of any effort to deal with bicycle theft. The citizens must be the driving force behind any significant change regarding theft, as their attitude is the ultimate obstacle in dealing with the problem. Such an attitude is the product of enduring bicycle theft for decades, and is not a symptom of a greater problem with Danish culture. It is therefore reasonable to say that such efforts will not require changing other facets of society, which helps focus the end goal of having the cyclists be the driving force behind solving the issue.
Chapter 7: Recommendations

Based on our research results, we have developed the following recommendations for the DCF. We have a number of deliverables to raise awareness about the problem and also have city-wide solutions that will help improve the issue. Through a less expensive, more social approach and coupled with infrastructure improvements, bicycle theft could see a reduction in Copenhagen.

7.1 Anti- Bicycle Theft Campaign

It is our understanding that one of the biggest obstacles facing the prevention of bike theft is the mentality of the Danish citizens towards the problem. Bike theft has been such a large issue in Denmark almost since the bicycle was introduced that the Danes have adapted to it. Ultimately, the result is that the Danes do not feel they can solve the issue on an individual level and have passed the responsibility to the police and involved businesses.

It is our opinion that nothing will change until the cyclists start to take the initiative. Waiting for and expecting a single solution that entirely solves the problem has not, and likely will not work. It is therefore necessary to sensitize the public’s opinion on the issue, and in the end, make the citizens feel as if they can change the state of theft.

One way to achieve this is through an informational campaign. The focus of which would be the distribution of information and the centralization and promotion of available resources. The end result would be the empowerment of cyclists through knowledge, reinforcing what they can do to combat bike theft themselves.

We have created a dedicated website and flyers that contain all the information a cyclist needs to understand the degree of theft in Copenhagen and how they can contribute to its prevention. The website consists of four categories, in addition to a home page and contact page; it provides a variety of relevant services for the bike user. These pages are detailed in Table 4 and can be viewed in Appendix F.
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tracker</td>
<td>A real time map of Copenhagen, showing where thefts have occurred. Information will be taken from the Falck database on reported thefts to highlight hotspots.</td>
</tr>
<tr>
<td>Advice</td>
<td>Electronic forms of the flyers, divided by category, highlighting how to protect your bike and bike theft statistics.</td>
</tr>
<tr>
<td>Resources</td>
<td>Links to a variety of anti-theft organizations, companies and programs, with descriptions.</td>
</tr>
<tr>
<td>Kids</td>
<td>A kids’ game with the goal of emphasizing the role the community plays in preventing theft and a link for children to upload and register their bikes through Hviscykel.</td>
</tr>
</tbody>
</table>

The intention of the first page, the tracker, is to provide cyclists with a map of where theft is most likely to occur, so they know where to take greater caution. Many cyclists know that the train stations, such as Nørreport, are high-risk areas. This may help to highlight other locations which may be less obvious. The map also allows interested parties to know where to install anti-theft measures such as increased surveillance and better parking, to most effectively improve security. It is intended to be a simple and convenient way to appraise theft, and to highlight how much of an issue it currently is.

The advice page answers questions regarding theft. Linked to this page are useful infographics, which reduce a substantial amount of data regarding bike theft into an understandable and easy-to-read form. The intention is to make cyclists feel in control of the issue because they can quantify it to better understand its scope. People are far more likely to feel like they can reduce a problem if they comprehend it fully, and the advice page aims to achieve that.

In our research, we realized there was no single location to find everything available to help prevent bike theft. Therefore, the next two pages of the website are devoted to that. The links on these pages list different groups involved in theft, including the police, the DCF, and various registry and technology companies. Each link is accompanied by a description. The theory is that if people can easily see what is available to help solve the problem, they will then make the effort themselves.

The final page is to involve the younger generation. To children, it is unlikely the financial impact of bike theft will make much sense, and is likely equally difficult for them to grasp the social implications. We
have therefore created a simple game intended to teach them the best practices for dealing with theft and to raise awareness. If children are encouraged to actively solve the problem, they will in turn encourage the involvement of parents.

Figure 16: Screenshot from the *Biking Vikings* children’s game (Cantalupo, Crowe, & Kent, 2013)

The remainder of this campaign involves distribution, primarily of the flyers created and any other materials the DCF deems appropriate. There are three infographics that can be displayed on the flyers, each covering a different aspect of bicycle theft. These can be viewed in detail in Appendix G. One depicts what can be done on an individual level. The other two cover various statistics on the issue, from theft as a whole, to facts about the Danish cyclists. To ensure widespread distribution and exposure, the flyers would be sent out with regular DCF and insurance company mailings. Additionally, they could be handed out with the purchase of any new bike at bicycle dealers. The end goal of this effort would be to ensure that people understand the issue of theft and what resources are available to combat it. This would also require the involvement of insurance companies and bicycle dealers regarding the distribution of these flyers.

This campaign is both a short and long-term solution to the issue of bike theft, but ultimately, it would require minimal funding. It is a short term solution in that it can be implemented readily, at a very low cost for the DCF. The effects will likely be seen in the long term, however, as it would take time for the information to spread and for cyclists to start acting on it. Once they do, and feel as if they can solve the problem, they will start to pressure other groups, such as the police, to do the same. The ultimate end goal of the campaign is to have cyclists put their weight on the authorities to work towards solving the issue, not for the public, but with the public.
7.2 City-Wide Solutions

Since we have concluded that a new technology would not be the most effective method for solving theft in Copenhagen, the following recommendations are focused more on improving the bicycle situation in the city. They range from improving bicycle parking to changes in the way the actual bicycles are handled.

7.2.1 Improved Parking

One piece of information found from both our observations and our survey was that there is simply not sufficient parking available, especially at train stations. Anywhere from 25-50% of all bikes were not parked in a rack because the racks were completely full. In the few cases where they were not full (only found around Copenhagen Central Station), the racks were inconveniently located behind the station. Therefore cyclists will likely not use them. Supporting this observation is a study stating that cyclists will not use parking more than 150 feet (46m) from the entrance to a destination (Johnson, Sidebottom, & Thorpe, 2009). What can therefore be concluded is that any added parking would have to be close and convenient to the destination it services.

Unfortunately, adding parking does present a problem. In order to fit more parking at the stations, it would most likely have to be stacked. Based on our observations at Nørreport Station, cyclists appeared unwilling to use stacked bike parking, preferring only to use the bottom racks. Should no bottom rack be available, they would fly park their bike instead of lifting it up to use the second level. Regrettably, there is no simple solution to the problem. It would be possible to have the first rack set into the ground and accessible via a ramp so both the top and bottom racks are accessible via “ground level” as shown in Figure 17, but building such structures in bulk would be expensive. While Nørreport Station would be an ideal location to utilize this system, it is under construction already, thus adding such complicated bike racks is not likely possible. Other designs for stacked bike racks use mechanisms which allow the top rack to be brought down, a bike to be positioned on it, and then lifted back into place. Again, such racks are complicated and not necessarily cost effective. It is our judgment, however, that the issue of people not using stacked bike parking is not important enough to warrant significant investment, but should another station be redesigned and improved, it would be worth considering.
More parking alone is not enough to solve the issue. The current style of single-level bike racks only offer support for the front wheel and do not encourage secure locking as it is difficult to lock a bike to these racks. One can lock the front wheel, but since the front wheel of a bike can easily be removed, this does little to prevent theft. Also, this makes the better locks such as heavy chain locks or U-Locks difficult to use, as they are not always long enough to reach from the rack to the bike frame. Adding evidence to this, many of the bikes with multiple locks either were locked to themselves, with a cable running around the front wheel and the frame, or to something which was not a rack, usually a fence. The survey conducted confirmed the fact that current bike parking facilities are insufficient with a number of responses simply stating “the rack is not good enough.”

Solving this problem requires a different rack design, a variety of which are available. While further research is required to assess implementation, we have determined a rack design which we feel would be most successful. Courtesy of the Design Against Crime Research Centre in the UK, the “chain rack” was found to be the most effective at improving locking rates (Johnson, Sidebottom, & Thorpe, 2008). Consisting of a heavy gauge chain attached to a simple, staple-shaped rack, as shown in Figure 18, the only measure a cyclist would need to do is carry a padlock to lock the bike. This would remove the need for carrying bulky, inconvenient chain or U-locks, making it much easier and faster to properly lock a bike. Additionally, it would not be difficult to build a great number of these racks, as they do not require significantly more space than the present wheel racks.
Improved parking is a long-term and higher-cost solution, as it would take time to secure the funding for the racks and to build them. Once implemented, however, these measures would make theft much harder. Locking a bike is still the best way to stop it from being stolen; therefore, it is logical to make locking as straightforward and convenient as possible.

7.2.2 Abandoned Bicycle Cleanup

A shorter term solution to insufficient parking is to make space more readily available. According to a previous IQP regarding bike parking, nearly a third of all bikes at Nørreport had been there for more than four weeks and were considered abandoned (Banker, Keches, & Murphy, 2006). Removing those bikes would free up a significant amount of parking. Unfortunately, at the present time, bikes are only collected, at most, once a year. Thus bikes remain abandoned for months in the racks, taking up valuable space.

Our suggestion is to mark and collect abandoned bikes more frequently. Ideally, this should be performed at least twice a year to make the most of available parking for a minimal time commitment and money investment. If the above one-third value holds true elsewhere, it could mean no additional parking is necessary. There is also another benefit to more frequent collection: aesthetics. Abandoned bikes are usually rusted, broken or otherwise unsightly; therefore, removing them would improve the look of stations. This may also encourage cyclists to take better care of their bikes, lest they be removed on account of being “abandoned.”
Another aspect of this issue is that while more frequent bike collection is helpful, it is hampered by the current methods of disposal. Bikes collected are brought to a consistent location; the Lost Property Office. Unfortunately, that location is not near the city center, which makes it difficult for citizens to access. Given that many bikes are inexpensive, it is often not worth traveling out to the office to claim a found one. To improve the recovery rates of bicycles, the office should either be moved or be made easier to reach. Since this would be difficult, it would make more sense to build a dedicated bike processing center, similar to what exists in Amsterdam, and as mentioned in Chapter 2. All abandoned bikes could then be brought there and processed, making it easier for Danes to pick up recovered bikes. Furthermore, the center could also function as a location for the disposal of old bikes so that they are not just abandoned at the station.

A proposal such as this would require a significant investment. On a lower cost scale, it would be advised to begin with more frequent bike collection, potentially sponsored by a private organization. This would free up space in the shortest amount of time. In the long term, a dedicated bike processing center could be built, allowing for people to claim their bikes from an easily accessible location. If bike recovery rates increased, the attitude towards bikes being “disposable” may change, resulting in better care of bikes and improved anti-theft behaviors.

7.2.3 Open Police Database
The police currently maintain records of every bike reported stolen. Unfortunately, that database is not publicly accessible. Of the seven bike dealers interviewed, only one, Søen’s Cykler, had access to the database via a contact in the police. Many stakeholders interviewed, bike shop owners in particular, recommended that this database be made public. This would be a very effective action for two reasons. The first is to give bike dealers the ability to check if a bike was stolen, and the second is to allow the data to be analyzed to determine where thefts occur in order to maximize the effectiveness of anti-theft strategies.

Bike dealers currently do not have the means to easily check if a bike is stolen. Therefore, most do not purchase bikes from individuals. This implies that individuals have no way to easily sell bikes they no longer want except online through sites such as Craigslist or Den Blå Avis. While these sites take some measures to prevent people selling stolen property, only so much can be done and subsequently, many people are unwilling to purchase bikes in this manner. At present, it is highly difficult to verify if the bike being purchased is stolen. Making the database publicly available would open an avenue for bike dealers...
to purchase bikes from owners, allowing a way for cyclists to sell unwanted bikes. This would also minimize the notion that bikes are disposable, leading to better care of bikes and potentially a willingness to buy more expensive bikes.

Another reason for making the database publicly available is to allow organizations, such as the DCF, to “data-mine” and determine trends in theft. High risk areas or bike types could be identified. Trends, including the effectiveness of particular locks, could also be determined. Currently, locks need to pass certain tests to be accepted by the insurance companies, but it is unclear if any analysis is done after the fact. A lock may be approved, but after analysis, it could be determined to be insufficient. Opening the database to the public would allow for these connections and others to be made, enabling bike theft to be better objectified and solved.

Fortunately, there are initiatives in place to open the police database. In our interview with Vicepolitiinspektør Henrik Framvig of the Danish National Police, it was revealed that the police database could be made public within a year to a year and a half. Unfortunately, the release of the database is not a priority, thus this timetable may be optimistic. It is therefore our recommendation that the DCF continue to place pressure on releasing this database to the public.

The database, once public, is also set to be expanded to include all bikes, not just bikes that have been stolen. It would not be unreasonable to then investigate some manner of technology to be linked to this database, such as QR codes or RFID. However, it would still take the other listed infrastructure improvements to make such measures truly effective. The question of technology should therefore be reconsidered in a few years.

The proposed plan would begin with the campaign geared toward changing the citizens’ opinions on the issue. Then, using the public as leverage, infrastructure in terms of parking and clean up could be improved. Hopefully, at this point, the police database would be open to the public to encourage community involvement as well as enable theft analysis.

Bike theft has been a vexing issue for so long, and solving it will be a slow process. However, should our plan be implemented the magnitude of the problem in all likelihood will significantly be reduced.
Bibliography


*Interactive Qualifying Project*


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Appendix

A. Interviews

The DCF

This interview was conducted via email with our project liaison, Mr. Jakob Schiøtt Stenbæk Madsen, political consultant at the DCF. The answers to these questions are taken directly from the email and have not been corrected for spelling or grammar.

1. **What is your role at the DCF and how long have you been working there?**
   
   I work as political consultant and have been here for 3 years.

2. **Have you ever had a bicycle stolen and does the threat of having a bicycle stolen affect where and when you cycle?**
   
   Yes, I have had one or two bikes stolen, but it's actually a long time ago. Bicycle theft doesn't have any effect on my bicycle conduct.

3. **What is the role of the DCF regarding this problem and how much research has already been conducted into the understanding of bicycle theft in Copenhagen?**
   
   We try to active the police, the Ministry of Justice, and the insurance industry. Furthermore we support and engage in different project working on fighting bike theft. I would say no research - but the City of Copenhagen have some data related to bike theft.

4. **How much of a concern is it amongst Danes?**
   
   I would say that it concerns Danes, but it is a source of irritation for many people, because if you have an expensive bike, you need to be precautious.

5. **Have you seen a shift recently in the motives and operations for bicycle theft?**
   
   I think it's getting more and more big business, but we don't know! There are some signs that people almost earns there living only on stealing expensive bikes (especially cargo bikes). And crews coming to Denmark to steal bikes. 10 years ago, I think bike theft were more related to alcohol consumption...

6. **Who wants to see a change in the way bicycle theft is handled right now?**
   
   The cyclists! And most cities.

7. **Where do the cyclists, police department, insurance companies, and other stakeholders stand on the issue?**
   
   Most stakeholders aren't doing anything about the problem. Especially the police.
8. **What is your opinion on the current measures in place to deter bicycle theft?**
   There are incredible bad!

9. **Why is bicycle theft a problem right now and was there a specific reason we were asked to research this problem for our project?**
   Good question! I don't know the answer on the latter, but there are big problems regarding bike theft in Denmark. We have had some organizational changes at the office, so I don't know the wording of your project. Can you help me out? When I get this, I can probably help you with your last questions!
Meeting with the Director of the DCF (Jens Loft Rasmussen, March 26th 2013):

1. **What is the role of the DCF and have they done any research on the problem? Do they have any studies or statistics?**

   The DCF’s goal is to protect the valuable bikes that are worth something as well as removing the bikes that are just left there by the owners. He fears Copenhagen will turn into Amsterdam where you can’t lock your bikes outside anymore. Organized crime will make people need to store their bikes only inside. These organized criminals definitely target nicer bikes and this is not supportive for bike culture if the mentality is to only buy cheap bikes. He wants to encourage people to buy nicer bikes for comfort and long distance travel.

2. **Who wants to see this problem addressed? Which stakeholders really want a solution to bicycle theft?**

   He hears from many of the DCF members that they want a good bike, but the possibility of it being stolen is too great to risk the investment. This is especially when you depend on the bike for daily life. It is frustrating that many don’t care and there is a huge interest from members to change this bad situation. The project is a very relevant issue in their daily life.

3. **We have heard that the police and the insurance companies are not really interested in helping solve this problem. Do you have any ideas on how to gain their support and assistance?**

   The police have a register, but they don’t do anything with it since it is internal. Numbers are stamped on the bikes, but sometimes you can’t even find them. The DCF suggested making it public, but nothing has been done yet. They also tried to engage the insurance companies, but in general, they were not responsive. Falck will have a lot of data and hopefully be able to collect data on Denmark now since “Data sent to police is like a black hole.” They have suggested data mining to the police so they could track theft and they still don’t.

   Jens would like to discuss with the insurance companies about if you are safe and have not had your bike stolen, perhaps a discounted price or premium for taking good protective measures can be offered.

4. **What is currently being done to deter and prevent theft? What is your opinion on these measures?**

   The DCF is currently signing an agreement with Falck; a security tech company that contributes to a safer society. Falck has a bicycle register – the Falck bicycle register. If you are a private
person, you can go to Falck and pay 99 kroner a year to get a label for your bike and give them the information on your insurance company and bike. If your bike is stolen, you phone Falck to report it and they contact directly your insurance company and the police. This agreement will say that if you are a member of the DCF, you will be able to register for free. The DCF pays Falck a payment to cover those 18,000 members and to give them the right to register without any fee. It also provides them with insurance and covers if a person is injured in a bike accident.

The DCF is doing this private agreement since they haven’t made any progress on other fronts such as with the police and insurance agencies. The DCF hopes to get more members and Falck hopes to get more people in the register. Falck’s goal is to have 200,000-300,000 members in the registry and hopes DCF will help bring them to that level. To buy and insure yourself through Falck it costs 200 kroner and yearly access to database is around 100 kroner while the DCF membership is 345 kroner a year plus all DCF membership benefits. Falck is a very large company that works all over the world and it will ensure a good register since they already have the muscle and brand power to lift up the DCF a bit.

In Norway and Sweden it is proven that a label from Falck makes it harder to sell a stolen bike within the country, therefore discouraging theft. It means ultimately it will be more difficult to sell in Denmark, but if they are exported to Poland, they don’t know if that will help. It will be easier for the average citizen to help; they don’t have to contact the police because the police are useless; they just need to scan the Falck label on your phone or call Falck.

5. **What is the motivation for this project?** Was there a specific reason we were asked to do this project right now?

   It is very important for Denmark’s bicycle culture that people worry about bike theft. If people just accept it, they will not try to buy nice bikes and such.

6. **What do you want from us?** What is the DCF looking for in this project? Any specific deliverables?

   He wants us to analyze what is going on a bit to give help and advice for DCF to move in the right direction. The Falck initiative is the most powerful one right now and it would be great if other companies could be absorbed in this model too, or competition between two companies.
Christina Britz (April 4th 2013)

1. **What is your role at the DCF and how long have you been working there?**
   Christina has been working with DCF for 1 year and 3 months. She had done some freelance jobs and that’s how she got to know about DCF. It was through an exhibition on Copenhagen bike history. She currently works with communications in that department.

2. **Have you ever had a bicycle stolen and does the threat of having a bicycle stolen affect where and when you cycle?**
   No, she has never had a bike stolen and feels like the only person in the city who hasn’t. On the other hand, she has also never had a nice quality bicycle and feels like that might be why and lives in a place where she can store her bike pretty safely.

3. **What is the role of the DCF?**
   The purpose of DCF has not changed much since it was established in 1905 and that purpose has been to improve conditions for cyclists including both physical and political. Essentially, it is to improve the life of the cyclists.

4. **What are some of the major accomplishments for the DCF?**
   The most recent success is that the DCF has been fighting for the ability to have bikes on trains for quite a while. The ability to have your bike on a train has only been around in the past year or so.

   The frame number was actually an invention from the DCF. Even in 1915 there was an article about how bike theft was a problem. A competition was created on how to prevent theft and the winning submission was the idea of a frame engraved number. It was actually implemented in around 1942, but the invention was from the DCF though.

   In the 70s, they were a really big foundation and they spurred a lot of demonstrations at the time. Things such as playing mini golf in the bike lanes to prove how poor the roads were was one of these actions and it had a large impact on the city planners. A lot of the bike lanes were cancelled in the 60s with the great increase of cars and their members did a lot of demonstrations to rebuild Copenhagen as a cycling city.

   In 1910, one of the earlier things they did was regarding how bikes only had a small part of the street compared to horse and carriages. Members went out to count the number of horses
versus the number of bikes (18 vs. 9000) and then fought and won to have a bigger part of street. The DCF has had a lot of small victories and its achievements are always done in collaboration with someone else. It is hard for the organization to claim victories as their own, but they spur a lot of action.

5. **What is something the organization is working on right now?**
   Right now, everyone is working on the “Bike to Work” campaign which starts on the first of May and began in 1997. It is one of the major events for the organization. Around 100,000 people participate all over the country. People team up with their companies and bike to work and that is the campaign they are spending all their time on currently.

6. **How is the DCF funded?**
   They have 18,000 members, which contributes to the money, but is only a small contribution though; too small. Otherwise funding comes from campaigns such as “Bike to Work.” This is planned with another organization and other campaigns (they also have “Bike to School”) and that one is done with an insurance company who helps the DCF. They have an expert who writes applications for private and political funding, but nothing is ever just given to the organization regularly. They must apply to everything, and nothing is constant.

7. **How does the DCF advertise and promote itself?**
   Promotion and advertising is done through the campaigns. There are 42 local departments spread throughout the country who do local activities and announce it in the local media. They do have to do more promotion and that is one of the items on their agenda.

8. **What is the state of the DCF and what plans do they have for the future?**
   There are only around 18,000 members and wish they had more for strength. They have around 2000-4000 members who are actively organizing the local work and they are the hardcore group. The rest are members who get the magazine, use the service etc. Members pay around 360 DKK per person and receive a discount in the shop, a magazine 4 times a year, and have discounts on places you can go on holiday and free registry with Falck now. Members also have free access to a lawyer if they have had an accident or need an evaluation with a bicycle related legal case or something.

   For the first time right now, the DCF is actually sitting in government appointed groups on how to reduce bicycle congestion. This is new that they are being invited into that. Locally (in the towns), Christina believes they have a lot of power, but nationally, this is the first time they are
being involved in bicycle plans. For the future of DCF; they are aiming for more members, to become more known, and more influential.

9. **What is your opinion on the bicycle theft currently?**

There have been bikes stolen since the bike was invented. She does not think organized crime is a problem and knows people who steal bikes, but these people do not think it is actually a crime. There needs to be a change in this mentality. For the insurance companies, it’s a good way to get clients by promising them compensation quickly.

Christina had around 25,000 DKK stolen in a house robbery and the police didn’t put in the effort to help find that either. They did not consider that a large enough amount of money to investigate. Cyclists think it is just them, but it seems that the police do not put in the effort in other forms of theft either. The police also used to stop people on the street to check frame numbers randomly. They would check for stolen bikes. This would have the same effect as why people still purchase train tickets; there is the fear of being on the train without a ticket. Or in this case, the fear of being caught on a stolen bike. This would probably be better than just the police sitting on street corners twice a year checking to make sure cyclists have their lights and such which is what they currently do.

10. **What is the DCF expecting as an outcome from this project and what is your opinion on our current progress?**

Cycling has really exploded in the past 10 years and that is something she has noticed herself which makes this project very applicable. It will be interesting to see whatever we come up with. She is curious to see what a different perspective sees and they have no expectations or pressure really. Christina thinks the campaign is where the DCF will see their potential because they will want to promote “become a member with us and we will solve your problems.” Most people want someone to do something else for them. The DCF could solve their problems. This could be a great conclusion at the end of the project – people would become members if the DCF promotes assistance in bike theft prevention.
Police

Summary of interview with Henrik Framvig – 4/25/2013

Introductory Questions

1. How long have you been on the Danish Police Force and what is your position?

Henrik Framvig has been working in the Danish police force for 32 years and is currently the Deputy Chief Superintendent of the Danish National Police. This is more of a federal position and is not one of the different departments that are out in the country for specific regions. He is very happy with the past 32 years of work and during his career he has been abroad, worked as a dog handler, worked in international with foreign cases, and other kinds of police work. He enjoys it because if you get tired of your current position, you can try something else.

2. What is the police’s general approach to public safety?

The connection of the federal department is through the individual local departments and that is connection to local population. In order to connect to the public, he connects to the local police officers and that is how they work with the population. A police officer not on duty is never in uniform. The policy is that when wearing a uniform, the person is expected to act as a police officer and when not in uniform, they are not required to react as an officer.

Bike Theft

3. Where and when do most bike thefts occur?

Train stations are definitely the most common locations for bicycle theft.

4. What impact does bike theft have on your activities? Does bike theft take up a significant amount of time or resources?

It is no secret that the police do not devote many resources to the issue of bike theft. A few years ago, the previous commissioner made a comment on how bicycle theft was not a concern of the police. Although Henrik agreed this was not a good remark on the commissioner’s part, it does reflect the general police attitude on the problem. They do not place much emphasis on bike theft because the population just looks at theft as an opportunity to get a new bike. Most citizens do not count on having their bike returned. Most people have their way of dealing with theft since it is so common and they are ok with it. The insurance companies have made the process of receiving money for stolen bikes very easy. You just fill out a note with the police and get a receipt which you submit to the insurance company and in three days or less you have the money to buy a new bike. Officers do occasionally stop people on the streets to check bikes.
5. **What motives do you feel exist for theft? Has there been a shift?**

Regarding bikes, the police do not think there is an increase in professional thieves. There are more local gangs that steal bikes to tear them apart and sell the parts, but he does not think this business has a lot of profit involved therefore these gangs usually look towards other more expensive items to steal and sell such as furniture or electronics.

6. **Do you feel bike theft is more of an issue for Copenhagen than elsewhere? While theft is higher in the city, do you think it’s disproportionately higher?**

He thinks the rate of theft is very similar across Denmark. It is not disproportionally high in Copenhagen. The amount of bikes stolen is higher only because the population is greater and therefore there are a lot more bikes.

### Organized Theft

7. **Who do you feel is most responsible for theft?**

Clearly the individual stealing a bike constitutes the majority of thefts. This is a lot more common than organized gangs. People stealing bikes is in connection with the mentality that bike theft is not really an issue. They know the police do not enforce it, they know it is easy to claim money from insurance, and they might have even had their own bike stolen.

8. **How much of an issue do you feel such gangs are? Is their effect overblown?**

Eastern European gangs are nothing new in Denmark and it has happened more than once. Not only are they involved in bike theft, the police have discovered a lot of theft involving gangs from Eastern Europe. There have been a lot of instances with people from Poland, Lithuania, or countries in that area who stop with a big car or truck at train stations to take bikes. These are the same trucks the police use when collecting abandoned bikes from stations. People do not question it because they think it is just the police making a collection. Although this has happened more than once, it is not a huge issue. It is more than just the one incident that was publicized in late 2012. There have been instances when police have been in Poland or other eastern countries and seen bikes from Denmark for sale on local markets where they can be purchased for a cheap price.

### VIN System

9. **Would you consider opening the database to the public? How difficult would this be and are there currently any plans to do so?**

They hope to have the bike registration database easily accessible within a year to a year and a half. This will enable people to quickly see the status of a bike. Due to the economic situation, this project is low on the list of priorities though. One of Henrik’s employees is working on the project of
making it more accessible though, so it is definitely happening. The goal is to be able to call a specific number of the police and receive an answer about your bike at once. Currently, you can call to request to see if the bike has been stolen, but you will be told to come to the station in around two days. At that point they will check. This is not a good solution especially if you are a person standing at a shop trying to buy a bike at that moment and wish to see if it has been stolen. The database will not be accessible directly by the individual, but the goal is that information about a specific bike can be requested and received within minutes.

10. **What improvements would you like to see to the VIN system?**

He thinks the improvements planned for the registration system will be very useful and will also hopefully encourage police involvement a bit more too. Linking a bike scanning technology to the database so police could walk along a rack of bikes to see if any have been registered as stolen would be helpful, but this is a big step that would be a low priority in this economy. Officers would probably be more active if all they had to do was scan though. He is not saying that Danish officers are lazy, but the easier the task is made, the more likely they are to perform the process. He would also like to see, at some point in time in the future, expanding the database to register all bikes. This will include bikes when they are purchased, not just stolen bikes.

**General Feelings on Theft**

11. **How much of an issue do you feel bike theft is in Denmark as a whole?**

Bike theft is definitely a widespread problem in Denmark, but the Danes have accepted it and have a process on how to deal with it that is sufficient. He thinks society’s mentality is the problem and also blames it on the insurance companies. There is so much competition between insurance companies, they use bike policies as incentive to gain customers and make it easy to claim compensation.

12. **Have you ever had a bike stolen?**

Henrik has had five bikes stolen in the past. They have all been at train stations while he was at work. He believes thieves know this is a period when stations are not busy because is at work, so the bikes are all available.

13. **What suggestions do you have in combatting the problem?**

There are some stations with more secure parking areas where you pay a small fee and receive a ticket to park your bike and he thinks this is very helpful and would prevent most theft. Unfortunately, when asked to pay a little, many are unwilling to use the system.
Anti-Bike Theft Organizations
We have a few questions we would like to ask you to help us improve our understanding of your involvement in your own country.

1. What is the purpose of your organization?
2. What is your role in this organization?
   a. How long have you worked there?
   b. Have you ever had a bicycle stolen?
3. How important is cycling to your area and how prevalent is bicycle theft?
4. How long have you been working on the problem of bicycle theft?
5. What methods have you implemented for bicycle theft prevention and recovery?
   a. What technological approaches have you considered?
      o Have you used RFID, VIN numbers, Police scanning?
   b. What social approaches have you considered?
      o Have you held anti-theft seminars, implemented bike sharing, and/or encouraged police involvement?
6. Do you feel these methods have been effective?
   a. What was the rate of bicycle theft before you started and what is the rate of theft now?
Politician/City Planner

We have a few questions we would like to ask you to help us improve our understanding you or your party’s involvement, and to understand [parliament/city council] general opinion on the matter.

1. Introductory Questions
   a. How long have you been in politics?
   b. Have you ever personally had a bike stolen?
   c. What is your party’s [or department] opinion?
   d. What is your opinion?
   e. Do you feel these opinions are shared amongst your peers?

2. How concerned is the government about the problem?

3. Has this issue been brought to a political level before?
   a. Who raised the issue?
   b. Were there any changes enacted as a result of this?

4. Have you noticed more of a push for bike theft prevention recently?
   a. There was an incident in September of a Lithuanian gang stealing a large amount of bikes to sell in Eastern Europe. Is this of concern on the political level?
      o At what point would it warrant government involvement?

5. Is there anything in particular you would like to see done regarding the problem?
Forsikring og pension (Representative of Danish insurance agencies)

1. Introductory Questions

a. What is the purpose of your organization?
Forsikring og Pension is a trade organization for Danish insurance and pension companies.

b. How long have you worked there?
Ricardo Pescatori has been working there for five years.

c. What is your role in it?
Consultant

d. Have you ever had a bike stolen?
Yes he has had a bike stolen and most likely 90% of Danes would say they have had a bike stolen.

e. How much of an issue do you feel bike theft is? What motives do you think exist?
Apart from it being irritating since it is a major means of transportation, it is also a hassle because you have to go out and buy a new bike. You might not get the same amount of money from insurance companies compared to what the bike was worth, so you would have to buy a different bike.

f. What do you feel the general opinion on theft is?
He believes it is mostly just petty theft where a person needs a bike coming home from a late night and does not have money for a taxi. Although, there is a major problem now of organized bike thieves coming from other countries stealing bikes in bulk and transporting to other countries such as Poland and Sweden.

2. Coverage Policy

a. What types of bicycle coverage policies do agencies offer?

- If they are rolled into a larger policy, why is it insured in this manner?
Bicycle theft is classified as a theft of its own when recorded by the insurance companies and is incorporated in the home insurance. The other categories are other home insurance problems such as burglary; categorized by a forced entrance break-in or by a thief walking in through an open window or door. Insurance-wise, the payout is different since for a burglary of forced entrance was not your fault at all.

- Are there any reasons why someone would want a stand-alone bike plan?
It is possible to get a plan that just covers bikes. You can add it as an addition to what you already have for a plan, or you can buy a specific bike insurance plan. This is quite common if you have an expensive bike. Under home insurance, it will usually cover up to 14,000 DKK, so if you have a more expensive bike, you would buy an individual coverage.

b. What is the process for submitting a stolen bike claim?
The process is very simple and you can do everything online. First, you go to report it on the police website and receive a journal number. This journal number is enough evidence to say that your bike was stolen. Then you send in the documentation that the bike was fitted with a lock, report the chassis and approved lock number, and the journal number to the insurance company and a couple days after you receive the compensation.

c. What effect does the age of the bike have on payout?
Bikes do depreciate and are considered new for up to 2 years (full value paid), but after that they depreciate around 10% per year. At 15-18 years old, only around 10% value remains on the bike but it will never depreciate to be worth nothing.

c. Are there any provisions for recovery of stolen bikes?
If the insurance sum already paid out, the found bike now belongs to the insurance company. They can sell it or do whatever they like with it. If it is not paid out, the bike is returned to the original owner of bike.

d. Is there a limit on the number of bicycles insured?
There is only a limit on payout value per bike, but there is no limit on the number of bikes that can be covered.

f. On what grounds will claims be denied?
If you have everything required, compensation will be paid. One of the few issues is that a person might buy a lock thinking it is insurance approved and it is not. The other problem is that they never kept a record of their chassis number.

3. Trends in claims
The data sent to us is just the total number of bikes stolen and the total compensation paid out. They don’t have data about the reason for theft; that would be something the police would possibly have. The amount of thefts reported to police versus the amount reported to insurance companies would give a value of how many thefts go unclaimed for compensation, but he does not have the police data. Ricardo does not know the exact amount of recovered bikes the
insurance companies have, but he knows it is a lot. The police might know because they often auction off these bikes. The insurance companies pay out the compensation and that is it. There is no analysis done. This is one of the minor thefts in Denmark; therefore insurance companies just pay out.

4. Correspondence with police

a. Do the agencies work with the police in handling claims? If so, can you recommend a contact within the police to us?

There is no cooperation or collaboration between the insurance companies and the police. Investigation is left solely to the police.

5. Final Notes

a. Is there anything you would like to see done about the problem?

Yes they would like to see a reduction; however they are not willing to support anything unless they know it will be successful. The companies will not put their money behind any initiatives unless they know it is going to work. If police could make checks regularly, such as at train stations to see if the bikes have been stolen, that would be very helpful. They would only need to be somewhat regular checks. He would like to see more of an effort from the police.
Danish cyclists

Note: Not all these questions are intended to be asked at once. The following is simply all the questions we would like to have answered at some point.

We have a few questions we would like to ask you to help us improve our understanding your experiences as a Danish cyclist.

1. Introductory Questions
   a. How often do you cycle?
   b. What is your general reason for bicycling; is it your primary means of transportation?
   c. How many bikes do you own?
      o What kind of bike(s) do you own?
   d. Do you ever use the City Bikes?
      o If so, how often?
      o For what purpose do you use them (recreation, transportation to work)?
      o What are your reasons for using them over a personal bike?

2. Experiences concerning theft
   a. Have you ever had a bicycle stolen?
      o If so how many, and how recent was the last one stolen?
      o Where were these bicycles stolen from?
      o Do you have an estimate of the time of day at which they were stolen?
      o Were any returned to you?
         1. How and by whom were they returned?
         2. Did you discover who stole it?
            a. If not, do you have an idea of who, in general terms (adolescent, adult, Dane, foreigner), may have stolen it?
            o How long did it take to recover them?
            o Did you file a report with the police and/or your insurance agency?
               1. How did you find the process of reporting an incident?
               2. Were you satisfied with their responses to the matter?

3. Effects of bicycle theft
   a. How concerned are you about bicycle theft?
   b. Does it prevent you from cycling to certain areas or during certain times of the day?
c. Do you do anything to prevent your bike from being stolen?
   o Has theft made you change your practices?

d. Is there anything you would like to see regarding bicycle theft prevention?
Bicycle Dealers (March 2013)

Summary of interview responses with the following: Mahina Baker (Baisikeli Café, 3/22/13), Henrik (Baisikeli Shop, 3/22/13), Martin (Søgade Cykel, 3/25/13), Jakob (Søen’s Cykler, 3/25/13), La Bicyclette Bleue (3/25/13), Daniel (Jupiter Cykler, 3/26/13), and Max (Max Cykler, 3/26/13).

1. Sales
   a. What types of bikes do you sell?
      Most sold new bikes and all said they avoided buying second hand bikes from individuals due to the risk of those bikes having been stolen. None of the businesses wanted to be involved in that. One of the shops that did sell second hand bikes had an agreement with the insurance companies where they purchased recovered bicycles from the insurance companies for a very cheap price. It is a supply of cheaper bikes, but from a credited source. Another shop sold new and handmade bikes.
   b. How many bikes on average do you sell a day or a week?
      Baisikeli estimated they sold around 5-10 bikes a day.
   c. Is there a process for registering purchased bicycles?
      When a bike is purchased, whether it is new or used, the frame number is listed on the receipt as well as the type of lock that comes with the bike. These must be kept, especially for insurance purposes and reporting the frame number to the police.
   d. How often are your customers purchasing bikes to replace a stolen one?
      Baisikeli predicts around 40%-60% of customers come in wanting to purchase the cheaper bicycles to replace a bike that was stolen. Søen’s Cykler has a lot of people coming in saying they wish to purchase a lower quality bike so they do not lose a lot of money if it is stolen. Jupiter Cykler estimates 40 out of 100 customers are purchasing a bike to replace a stolen one and Max from Max Cykler stated 50% of his customers are purchasing a bike to replace a stolen one.
   e. Have you seen an effect from theft on business?
      As a whole, people are looking more into cheaper, poorer quality bikes to buy because they do not want to lose a lot of money if their expensive bike is stolen.
   f. Are you ever approached by individuals attempting to sell suspicious bicycles?
      A lot of the shops are approached by individuals trying to sell bikes and the owners turn away all of these individuals due to the risk of purchasing stolen bicycles. A few
mentioned these individuals were not of native Danish decent, they were often Eastern European.

g. **Is there a policy for authenticating bicycles you purchase?**
   You can approach the police to ask them to check their stolen bicycle registry with the frame number of bicycles. This registry is only accessible by the police and is a bit of a hassle to have bikes checked, therefore most shops avoid being in the situation of having to authenticate second hand bikes.

h. **Is there anything you would like to see regarding bicycle theft prevention and recovery?**
   As a whole, all shops would be interested in making the bicycle registry database open to the public. It would make checking bicycles a lot easier and perhaps encourage people to check bikes on an individual level too. A few also mentioned better parking facilities at public venues and a more proactive maintenance of abandoned bikes would help. They would like people to be more interested in purchasing the higher end bicycles and not be afraid of losing these bikes to thieves. They say the organized criminals definitely target the better quality and more expensive bikes.
1. **Background Information: Can you give us some information on your background?**

   Peter Aagaard – has a Masters in Psychology and Business, owned a bike company in Mexico for a while, used to live in Mexico City. Avid cyclist and has biked from Toronto to San Francisco.

2. **Why is theft such an important issue to you?**

   a. **What is your opinion on theft?**

      i. **How organized do you think it is?**

         Denmark has a bit of the mentality that it is not their problem since they blame it on the organized crime consisting of foreigners from the Eastern European countries. This is partly correct, but the police do not see that many trucks crossing the border with thousands of bikes. It does happen though, but the bigger issue is that everyone is just pointing fingers at everyone else. Peter believes most stolen bikes are only taken within a 5 kilometer radius and the website will provide a way to report found bikes without saying who stole it.

      ii. **What do you feel needs to be done?**

         He does not believe that technology is going to solve all of Denmark’s problems regarding bicycle theft. Sees competitors in the technology tracking market, but does think bike theft needs a security solution.

3. **What is hviscykel.dk?**

   This is similar to a beta prototype of the website at the moment. It does not have any funding or critical mass yet. It consists of four sections. The first is to register your bike and just list it as in use and have an entry in the database. Then you can make a posting for a lost bike, found bikes, and free bikes.

   The site is very social driven and his idea is to have a powerful frame recognition technology. Peter hopes the site will get to the point where you upload pictures of your bike and when it is stolen, the site will use a bike recognition software to pull up any posts about your bike before you report it stolen to the police to see if it has been found. Everything will be photo-based relying on the fact that people can recognize a picture of their bikes.

   It will probably be easier in small areas of closer communities because it perhaps can grow to the point of sending out a local text to say if your bike has been stolen. The site will stand as a sort of
social insurance for your bike especially since nobody really knows their serial number, so it would be easier to have this social insurance.

4. Why is it necessary?

a. What prompted you to start it?

There is a definite cycling culture in Denmark where everyone bikes all year round. Over the past couple of years, it has become famous and mainstream. It has come to the point where a bike is like a tool; you use it and then you throw it away. It is regarded as a $200 tool and it is not about going fast, it is style over speed. One of the things where Denmark is really sloppy and where the culture could get a lot better is the people throw their bikes away. They waste a lot of bikes and this project is about working on that.

The frame number is in a bad location since it is usually located under the bottom bracket. This system was introduced in the 1950s, after the war, by the insurance companies. It is not the most convenient or efficient way to trace bikes.

In this society, the risk for bike theft is very high. As a societal issue, the high risk is on young people’s bikes. Around 26% of all theft reported in Denmark is theft of a bicycle which is greater than any other theft. It is easy to report a bike theft on the police.dk website, but you need two papers from your bike shop and the frame number. It is often never investigated and the insurance companies pay out compensation very quickly.

People buy really poor quality bikes because they do not want their nice bikes to be stolen. The risk for theft is really high, so a bicycle is kind of regarded like a vacuum cleaner. It is just an item.

5. What is its goal?

Peter aims to teach the population to share their bikes more and it is a good goal to start with since so many people throw their bikes away. A lot of people lose these bikes because they don’t care and get sloppy locking them. The aim is to make the bike more than just a consumer item, but more of a traceable, valuable possession.

He hopes to educate the users and make them responsible and the concept of the site could be expanded to cars and pets for example. Ultimately, the goal is to make the local bike shops a hub
for bicycles. It will allow them to service more bicycles too, which is their main source of income. It will develop into a business opportunity for sharing, a bit like carpooling where people will be able to share scrapped bikes.

6. **How does the Dansk Cyklist Forbundet fit in?**

The DCF has tried to raise the issue at the highest political level to the Justiz Minister who is supposed to fund the issue and consult with the police. The DCF has done a good job at bringing it to a political level, but the police have basically given up and placed responsibility back on the individual.

7. **Is there anything in particular you would like the DCF to do?**

Peter would like us to keep him updated on our progress in the field of bicycle theft and also perhaps provide a link to our proposed bike theft awareness site on his hviscykel.dk. He also wishes us to evaluate his site in detail in order to provide feedback and any comments or ideas for changes.

8. **How do other stakeholders fit in? What do you want from them?**

   a. **The Police**

   The issue with the police is that they just say you should lock your bike and take better safety precautions. Their solution is the thicker the lock, the better. Theft in Holland is one step ahead of Denmark right now though, and thieves there have techniques where they can open up just about any lock within 5 minutes.

   b. **The Insurance companies**

   Insurance companies have the biggest stake since they pay out millions of kroner each year in bike compensations, but they have no desire to do anything. They are making a business based on people’s fears and they make money off of the fact that people are afraid their bikes will be stolen. Insurance companies are a part of the problem. Especially with young people, this helps them gain business. Most young people own a phone, computer, and bike as valuable items. The phone and computer you carry with you everywhere while the bike can very possibly be stolen, so young people will purchase insurance. The insurance companies work for the status quo.

   c. **The Bike Owners [the public]**

   Peter wants people to invest money in good quality bikes and make purchasing a bike more like an investment. The Danish people need to change their attitudes and really regard it as a problem. Danes are quite laid back and accustomed to sitting and have someone else do
the work or solve the problem. Need people to take the initiative which will ultimately result in deterring the thieves.

9. **What data do you have on the effectiveness of the program?**
   a. **Do you have a way of mapping the reports and tracking high risk areas?**
      There is a map that locates and places all of the posts including lost, found, and free bikes. This gives a visual way to browse through registered bicycles in specific areas. It is already functional and updated every time a new post is made.

10. **How do you plan to promote the program?**
    Peter aims to get funding and then go to a lot of schools to promote and encourage people, but kids in particular, to take a picture and register their bikes. This will start the momentum for the use of the site. He would also like to create an easy to use mobile app so people can always have this site available to them and make it easy for the user to participate. He also plans to expand to promotion via social media sites such as Facebook and Twitter.

11. **How do you benefit? How do you plan to make a profit because essentially this is still a business?**
    At the moment, since it is only a beta prototype, it is not making any money and is more of a hobby for Peter. He is relying on the hope that the site will receive funding in order for expansion and promotion. Peter did mention it would need to make money at some point in time, but there are no exact plans on how this will be done. It could include auctioning off of bikes that have been abandoned, but there was no mention of ever having to pay a membership fee.
B. Survey
We are American university students working with the Cyklistforbundet on the issue of bicycle theft in Copenhagen. The following questions are intended to help us understand the general state of theft in Copenhagen. We thank you for taking the time to fill out this survey.
Please circle the answer which best describes your opinion. This survey is anonymous.

1. How many days a week do you use a bike as a primary mode of transportation?

   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
---|---|---|---|---|---|---|---|---|

2. Where do you generally commute with your bike? (Circle all that apply)

   Work  School  Shopping  Recreation  Other:____________________

3. Have you ever had a bike stolen?

   Yes  No

4. How often do you use a bike lock?

   Always  Often  Sometimes  Never

5. What type of bike lock do you use? (Circle all that apply)

   Wheel  U Lock  Cable/Chain  Combination  None  Other:____________________

   Lock  Lock  Lock

6. How often do you use bike-parking facilities at public locations?

   Always  Often  Sometimes  Never

7. What is your main issue with bike parking facilities, in general?

   No Issue  Insufficient  Distance  Not provided at destination  Other:____________________

   Space  from  provided at  Destination  destination

   If you answered not provided, please provide the location(s):____________________

8. Do you maintain a record of your bicycle’s VIN and Lock Number?

   Yes  No

   Where:

8. What other methods, if any, do you use to keep your bike secure?

9. If you have ever stolen a bike, what were your reasons?

10. Are there any other comments you would like to make?
A summary of the multiple choice answers are listed below:

1. How many days a week do you use a bike as a primary mode of transportation?
   - 0 [3%]  
   - 1 [2%]  
   - 2 [6%]  
   - 3 [9%]  
   - 4 [2%]  
   - 5 [18%]  
   - 6 [12%]  
   - 7 [48%]

2. Where do you generally commute with your bike? (Circle all that apply)
   - Work [29%]  
   - School [9%]  
   - Shopping [27%]  
   - Recreation [32%]  
   - Other [3%]

3. Have you ever had a bike stolen?
   - Yes [73%]  
   - No [27%]

4. How often do you use a bike lock?
   - Always [96%]  
   - Often [2%]  
   - Sometimes [2%]  
   - Never [0%]

5. What type of bike lock do you use? (Circle all that apply)
   - Wheel Lock [32%]  
   - U Lock [29%]  
   - Cable/Chain Lock [31%]  
   - Combination Lock [5%]  
   - None [0%]  
   - Other [5%]

6. How often do you use bike-parking facilities at public locations?
   - Always [11%]  
   - Often [49%]  
   - Sometimes [31%]  
   - Never [9%]

7. What is your main issue with bike parking facilities, in general?
   - No Issue [13%]  
   - Insufficient Space [54%]  
   - Distance from Destination [8%]  
   - Not provided at destination [14%]  
   - Other [11%]
8. Do you maintain a record of your bicycle’s VIN and Lock Number?

Yes       No
[84%]     [16%]
C. Sponsor Description

The Dansk Cyklist Forbund, or Danish Cyclists Federation (DCF), is a large, non-governmental cycling organization. It covers all of Denmark and currently consists of around 18,000 members. With the exception of a small staff based in Copenhagen, it is entirely volunteer-based. Their mission is to promote cycling and bicycle safety throughout Denmark and essentially improve the life of cyclists.

The organization was founded in 1905 in response to how dangerous riding a bike in Denmark was. The streets were crowded with horses, wagons and riders. What paths existed for bike-only use were narrow, sharp and unsafe. Therefore, with a budget of just 1236.50 DKK and membership dues of a penny, the DCF was formed, with Captain Fritz Hansen as president.

Their first accomplishments were relatively small. Stations with pumps and tools were set up by inns and restaurants. They also cleaned up what bike paths existed and did their best to make them safe for bikers. Unfortunately, the existing paths were narrow and unhelpful. The group pushed to have them widened, citing a massive rate of accidents due to the cramped biking conditions. This was ultimately successful, with 3 meter wide paths being standard. Likewise, their continual political efforts and presence led, at least in part, to the formation of the First Road Traffic Act of 1923. They also invented the idea of the frame number for bikes in 1915, but this concept was not implemented until the 1940s. Recently, the organization succeeded in allowing bicycles to be taken on trains as well as had an influence in the national government regarding the reduction of bicycle congestion.

There is an estimated 4.5 million riders in Denmark, and thus the modern DCF does its best to promote their well-being and health. To this effect, the DCF sponsors a wide variety of programs to promote cycling in Denmark. In the simplest sense, they provide stores where bikes and related riding equipment can be purchased. They also run such programs as “Alle Børn Cykler” (All Kids Bike); where younger children are encouraged to bike, “Vi Cykler til Arbejde” (We Bike to Work); promoting cycling as a means of transportation to work and “Store Cykeldag” (Big Cycle Day); a one day cycling event encouraging family-oriented, recreational biking. These programs, participated in by nearly 300,000 Danes, are very popular and have been shown to be effective in promoting cycling. Campaigns such as these, membership fees, and private and political grants are how the DCF is funded.

As the organization is large, support for their work comes from a variety of sources. The “Politi,” or Danish Police, sponsor LYS PÅ -med Ludvig (LIGHT ON - with Louis), a program designed to make sure Danes use their bike lights, in conjunction Foreningen Østifterne. Other foundations include the Nordea Funden, who sponsor bike games and TrygFonden, who sponsor Alle Børn Cykler and Projektet Tryg og sikker skolecykling (Project Safe and secure school cycling). The DCF also receives the support of the
Danish Bicycle Dealers for their political endeavors. The Frilufts Rådet, or Outdoor Council, and the Labour Vacation Fund both help plan bike routes. The Vejdirektoratet, or Road Directorate, has aided the DCF in a variety of manners. Their last main sponsors are Falco and Realdania, who help expand knowledge and ideas.

The DCF is a large, effective organization with 42 local departments distributed throughout Denmark. For a fee, members earn a discount at the shop, access to a lawyer regarding bicycle related incidents, a quarterly magazine, discounts on vacation destinations, and most recently, free bike registry in the Falck database. With support from a variety of companies, they have the money and the ability to push for effective reforms and support of cyclists in Denmark. Having existed for 108 years, the DCF aims to continue its growth and promote cycling well into the future. They’re likely to remain a fixture of Danish cycling culture for many years to come.
D. Train Station Observations
E. Denmark Municipalities

1. Middelfart,
2. Frederickshavn
3. Randers
4. Frederiksberg
5. Copenhagen
6. Gladsaxe
7. Aarhus
8. Skandeborg
9. Hvidovre
Our Purpose

Bike theft is one of the largest issues facing Copenhagen today. Over 70,000 bikes are reported stolen every year, but the actual number is estimated to be twice that. Over a quarter of all theft in Denmark is entirely bikes, making bikes the most commonly stolen item in Denmark.

This website is here to change that. It provides you, the cyclist, with the knowledge and resources you need to keep your property where it should be.

Above you will find links to let you know where bikes are being stolen from and where they are being found. You will also find helpful advice on the best ways to protect your bike. Furthermore, information on the various programs and technologies to help you track or recover a stolen bike are also listed.

It may only take one person to steal a bike, but it takes a village to get it back.
G. Infographics

TO STOP A THIEF  Bike Theft is A Serious Issue
Here’s how you can to protect your bike

1  PARK IT
Make use of provided parking. A bike not secured to something fixed can easily be taken.
Some stations even provide underground parking.

2  LOCK IT
An unlocked bike is as good as gone. Be sure to use your ring lock. To be more secure, add a cable lock and always lock around a fixed structure.

3  SHOW IT
Thieves have a hard time stealing a bike everyone can see. When you’re out, park your bike somewhere people will notice.

4  STORE IT
Bikes are most likely to be stolen at night. If you can, store your bike somewhere not on the street - a courtyard works best.

5  TAG IT
For the best chance at getting a stolen bike back, register it online. Falck Cykelregister and Hvicsykel are two options. Also, report the theft to the police.
BIKE THEFT BY THE NUMBERS

Every 7 minutes a bike is stolen in Denmark
Bike Theft Costs over 230 Million Kroner a Year
3 OUT OF 4 DANES HAVE HAD A BIKE STOLEN

Theft is highest in the summer.

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost (Million Kr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robbery</td>
<td>1.480</td>
</tr>
<tr>
<td>Simple Theft</td>
<td>442</td>
</tr>
<tr>
<td>Bike Theft</td>
<td>232</td>
</tr>
<tr>
<td>Mugging</td>
<td>62</td>
</tr>
</tbody>
</table>

Bike Theft is the 3rd highest cost for insurance companies.

Insurance isn’t claimed 25% of the time
60M Kr goes unclaimed

Bikes Stolen Annually

København: 19.700
Århus: 5.650
Odense: 4.600

Data from Forsikring Og Pension and Danmark Statistik
“3 out of 4” from a survey of 122 Danes conducted via the DCF
Half of all Danes use a bike every day of the week

96% always use a lock
40% use more than one
The ring lock is the most popular

- Parking -
Only 10% use parking
Because there’s simply not enough room
...If there is parking at all

- Theft -
3 of 4 Danes have had a bike stolen
8% admit to stealing a bike themselves
Mostly because it was unlocked

84% keep a record of their chassis number

Data from a Survey of 122 Danish Cyclists via the DCF
SOLVING THE PROBLEM: A Summary of Our Solutions

**Step 1**
The Campaign
Raise awareness of what the individual can do

**Step 2**
The Clean Up
Clean up all the abandoned bikes

**Step 3**
The Parking
Increase the amount and quality of parking

**Step 4**
The Database
Open the police stolen-bike database to the public

**Step 5**
The Future
Then consider technology