

# Improving Bike Shed Safety and Accessibility at LUC The Hague

## PROJECT EVALUATION REPORT

Course title: Common Pool Resource Management

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### **PROJECT SUMMARY**

This project aims to improve the security and accessibility of the bike shed at Leiden University College The Hague (LUC). While the physical characteristics of the bike shed meet general security prescriptions and common expectations of accessibility, the behaviour of some of its users has had a negative impact on the extent to which the shed is safe and accessible to the entire LUC community. More specifically, ever since the shed has been open to use, certain users have granted themselves the comfort of parking their bikes between two racks, in front of racks or in the middle of the pathway. Troublesome, such obstructions prevent other community members from getting their bikes from the racks, parking their bikes inside the racks, or leaving the bike shed easily in case of emergency. Hoping to tackle this issue, it is the purpose of this project to incentivise all community members to park their bikes inside the therefore designated racks. The evaluation report that lies in front of you describes the short-term and long-term solutions that (should) have been implemented, as well as the entire process that led to the final implementation of these solutions.

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## **INTRODUCTION**

### **PHYSICAL DESCRIPTION: NARROWING DOWN THE PROBLEM**

## Improving Bike Shed Safety and Accessibility at LUC The Hague

The Anna van Buerenplein (AvB) bike shed currently provides more than enough parking racks for all inhabitants of the university campus building.<sup>1</sup> There may be a few more rooms than racks, but after having observed the shed for approximately one month, there seems to be no point in time when all racks are occupied. The racks can be divided into two categories: upper-level racks, which can be pulled down and lifted manually, and ground-level racks.<sup>2</sup> While many voices have been raised about the fact that LUC students who do not inhabit AvB also wish to park their bikes inside the shed, this project focuses solely on those students who do have official permission to park their bikes inside the shed. So, when we speak of users, we only refer to the inhabitants of AvB who park their bike in the bike shed. Similarly, this project does not address questions of injustice regarding the fact that a certain section is designated for staff members only. Indeed, this particular section is not even considered part of the terrain that we hope to influence. In short, this project focuses only on AvB inhabitants and the section in the bike shed that is designated to them.

### PROBLEM DESCRIPTION

This project considers the AvB bike shed as a common-pool resource. That is, it regards it as a good that is non-excludable (hundreds of people have unlimited access), but that has a restricted capacity. If all bike owners park only one bike neatly inside a rack, the bike shed can be used without difficulties. If some users, however, park more than one bike inside the shed, or park their bikes outside of a rack, congestion increases and the system becomes dysfunctional or at least uncomfortable. It becomes dysfunctional when so many bikes are parked outside the racks, that the racks cannot be accessed anymore, and nobody can still enter or exit the bike shed. It becomes uncomfortable when those who parked their bikes inside a rack need to manoeuvre around erroneously parked bikes. In case of emergency, bikes that are parked outside of racks prevent people from exiting the building quickly.

People may park their bikes outside of a rack for various reasons. First, on an individual level, parking a bike inside a rack is costly compared to parking it in the middle of the pathway, or just in front of other (neatly parked) bikes. The individual can save him or herself both time and effort by placing the bike as near to the entrance and exit as possible. Second, the bike racks often seem to be full, while in fact they are not. Assuming that most people will always park their bikes in the racks that are close to the entrance, entering the bike shed may have an overwhelming effect. Differently put, people who enter the shed and see one or two fully occupied rows of racks may think: “Oh, it looks like it is very busy today, I will just have to park my bike outside of a rack then.” Third, the bike racks on the upper level require people to pull the rack down, place their bike inside the rack, and then lift the rack (including the full weight of their bike) to its original position.<sup>3</sup> While for many people this may only be a time and effort consuming activity, for others the process may be impossible, for example due to health-related issues. Finally, for some people the fact that other people park their bikes outside of racks may be convincing enough to do the same. These people may consider it demotivating to find others blocking the pathway, while they were originally sticking to the rules.

### STAKEHOLDER ANALYSIS

- Bike shed users:

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<sup>1</sup> Figure I in the Appendix provides a simplified map of the bike shed.

<sup>2</sup> Figure II in the Appendix illustrates this construction.

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This project divides the bike shed users into three categories. First, there are **cooperators**, or people who will park their bikes inside a rack, no matter the level of the rack or the number of erroneously parked bikes. Second, there are **defectors**, or people who will park their bikes outside of a rack, regardless of how many racks are full. Finally, there are **reciprocators**, or people who will base their decision on the number of bikes that are already parked inside or outside a rack. This project aims to reward cooperators, punish defectors, and persuade reciprocators to become cooperators by influencing the other two categories.

### - Concierge:

The concierge is responsible for the well-being of the bike shed. He can be seen as the bike shed's chief executive officer. The implementation of any new policy goes through him. He orders materials and is responsible for their maintenance. Therefore, all ideas should be discussed with him from the earlier stage in the process, to make sure he is not (negatively) surprised by the contents of the project.

### - Management:

The concierge has a boss. Budget-related issues require permission from a manager. This manager subsequently looks at whether the budget will be well spent, and may consult student and staff representatives through an election.

### - Student representatives:

This is a group of students representing the inhabitants of their respective floors. The manager may consult the student representatives before granting permission to the implementation of any new policy. Their collective stance is determined through a voting process.

## **TOWARDS A SAFE AND ACCESSIBLE BIKE SHED**

This section of the evaluation report focuses on the process that led towards the formation of the solutions that have finally been implemented to tackle the bike shed issues. The first part of this section provides a summary of solutions that were canceled, but which lead to the formation of the solutions that were finally (partially) implemented. The second part summarises these final solutions. Finally, this section discusses the implementation process of the largest solution proposed.

## **SUMMARY OF CANCELED SOLUTIONS**

- Canceled long term solutions: individual bike racks, division based on sex

At first, this project suggested to implement a system in which each bike rack was temporarily assigned to an inhabitant of AvB. This way, the common pool resource would be temporarily privatised. Anyone who enters the bike shed knows that his or her place is definitely available. Moreover, it is immediately noticed if someone parks his or her bike between or in front of racks. There were two main arguments against this idea. First, there are not enough racks to assign a single rack to each room number. Therefore particular measures need to be undertaken to come up with a distribution of the racks that is as fair as possible. “Fair” is a highly debatable concept, and it is unlikely that all community members would agree to a proposed distribution. Second, the system *could* increase the work load of the AvB administration. Complaints about unsocial behaviour would go directly to the concierge or his colleagues. This idea was hence canceled, but it laid out the pathway for the final solution discussed above.

Subsequently, the concierge suggested to make a division in the racks on the basis of sex. Female inhabitants would then have to park their bikes on the lower level, while male inhabitants would have to park their bikes on the upper level. The Project Team decided to reject this proposition, on the basis of expected negative response from the community. The LUC community is known to be highly involved in gender emancipation discussions, and we decided to keep this project outside of that arena. Nevertheless, both the LUC administration and our team seemed to be thinking along the same line: a structural reform in the bike shed’s organisation is necessary to incentivise social behaviour of its users in the long run.

### SUMMARY OF FINAL SOLUTIONS

#### - Final long term solution: floor division

In the long run, we have suggested and aimed to implement a floor-division system in which each floor of the campus building gets its own section in the bike shed. This system builds on the idea that common-pool resource management generally becomes easier as group size decreases (Olsen, 1985). By cutting the bike shed in parts, so to say, we hope to create small communities that correct defectors through already existing social mechanisms. Most floor members are closely connected, for example, and they all have one representative who is responsible for solving internal issues. Moreover, if each floor gets its own area within the bike shed, anyone entering the bike shed knows that there is, in any case, a spot available. This way defectors can be punished through existing social mechanisms (floor community norms and values) and all bike shed users are aware of the permanent availability of spots. This suggestion should be self-enforcing and can survive the graduation of one cohort, and the entrance of a new one.

Indeed, there are some obstacles to this solution: first, there still needs to be a fair distribution of the bike racks among the community; and second, there are more rooms at AvB than bike racks. Both of these obstacles can be addressed by assigning attractive spots (i.e. close to the entrance) to the floors that deliver the relatively lowest number of bikes. This way, we create an incentive for students to minimise the number of bikes per floor.

#### - Final short term solutions: posters, social media, and moving defector bikes

In the short run, we implemented an intensive campaign that promoted correct use of the bike shed by “rewarding” the cooperators and “punishing” the defectors. This was done through three main methods. First, we created

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motivational posters to encourage users to put their bike in the racks.<sup>4</sup> These were placed in the bike shed, in order to raise awareness of the problem and stimulate correct bike parking. Second, we took photos of correctly and erroneously parked bikes and posted these images on Facebook (LUC Central), accompanied by praising or disapproving comments. The main goal was to use social pressure to encourage correct bike parking. These posts were visible to the entire LUC community through LUC Confession bear, and generated a lot of attention.<sup>5</sup> Generally, people responded positively to these posts, and even identified and called out the owners of the erroneously parked bikes. Finally, several team members went to the bike shed at night and moved the erroneously parked bikes to the racks. We hoped that this action would make cooperation more attractive, and would deter defectors (because their bike could be displaced).

The selection criteria for choosing a defector or cooperator for the ‘hero of the day’ campaign were based on the amount of effort people took in parking their bikes. For example, an extra heavy bike placed in the top rack would be praised as the “hero of the day”, whereas a bike parked completely outside of the racks would be a prime example of a defector.

The effect of the campaign was monitored by counting the amount of cooperators, defectors, and free spots every night. We noticed that while there was much variation in the proportion of defectors/ cooperators, there were some bikes that were consistently outside of the racks and appeared to be barely used. The full impact of the campaign is discussed below in the results section.<sup>6</sup>

## EVALUATION OF IMPLEMENTATION PROCESS FINAL SOLUTIONS

### EVALUATION OF IMPLEMENTATION LONG TERM SOLUTION

After several modifications to our proposal for a long-term solution to the problem, we came to an agreement with the concierge in week 5. We concluded that by assigning each floor a section of the bike shed and use a color-coding system to identify where each bike belongs, the amount of defectors would likely be drastically reduced while the effort required from administration and the concierge would be minimal. The concierge appeared enthusiastic and promised to order the required materials as soon as possible, but did ask us if the implementation of the solution could wait until after the winter break for maximum effect. We agreed to this and decided to notify the Resident Assistants. Following a suggestion of the instructor, the RAs were asked to choose a colour for “their” section in advance, as a way of facilitating

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<sup>4</sup> These posters can be found in the Appendix.

<sup>5</sup> The Confession Bear is a Facebook account holder that allows LUC community members to share thoughts with the rest of the community anonymously. Thankfully, the secret manager of this marketing tool accepted to cooperate throughout the project.

<sup>6</sup> A quick overview of all erroneously parked bikes can be found in Table I under ‘RESULTS’.

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their collaboration with the project. Meanwhile, the concierge would contact his boss to inform him about the project and confirm the costs of implementing the solution.<sup>7</sup>

At the end of week 6 the last details of the project were discussed with the concierge during a meeting. Since our course and active involvement with the project would end after reading week, we agreed to send him a version of the completed report including recommendations for the post-winter break implementation, as well as an outline of the steps that still needed to be taken. Furthermore, the concierge mentioned that his boss had contacted the student organisation Fortuna regarding the project, and that they were not yet convinced of the solution. While we did not know exactly what they were told, we agreed to talk to Fortuna as well as to the RAs in order to remove discrepancy between our intentions and their knowledge as much as possible.

However, unbeknownst to us, Fortuna contacted the student representatives, who subsequently appear to have voted on the project. Our group was not notified of this vote and did not know whether the vote was actually concerned with the solution as we proposed it, or if another form of the project or a different issue all together have been discussed. Adding to the unclarity of this situation was that none of the team members living in the AvB building were aware that such a vote had taken place, even though they should have been informed about this. The entire procedure was only mentioned to our group after it had taken place, leaving us with little to no say in it.

Nevertheless, we unanimously decided that it was worth investigating what exactly happened and to continue working acceptance and implementation of our project, since it is in our opinion still the most viable solution to the bike shed problem. One of the team members residing at AvB scheduled a meeting with the housing representatives/ Fortuna in order to find out what the vote was concerned with and who was involved in it. The communications sub-group tried to contact the concierge's boss and the RAs to explain the exact proposal in person and discuss whether implementation of the project would be possible after all.

It turned out that even though the meeting was concerned with the lack of space in the bike shed, our proposal was not voted on during the meeting. Instead, the student representatives and Fortuna discussed whether non-AvB students should be denied access to the bike shed, and decided that these students could not be excluded. Subsequently, this decision was passed on to the concierge's boss, who concluded that our proposal of dividing and color-coding the bike shed should be rejected because Fortuna, the student representatives, (and therefore: the students) did not want to exclude third-years from the bike shed. Interestingly, the outcome of the meeting is in contradiction with earlier statements made by the Student Life Officer, who notified students that non-AvB students were no longer allowed to park their bikes in the shed.<sup>8</sup> This entire issue, of course, is not part of our project at all.

Thus, the project as we proposed it fits within the official bike shed policy which includes AvB students only. However, the fact that the student body does not agree with the exclusion of non-AvB students proved to be a main obstacle to the implementation of the project. Our current efforts are therefore directed at persuading the student representatives and Fortuna to read and discuss our proposal and convincing them that within the official situation this project could greatly improve the accessibility and safety of the bike shed.

In retrospect, it would have been useful to have had contact with both the management layer and the student representatives from the beginning of the project onwards. Both actors seemed to be irrelevant to the implementation process at front, but turned out to be key players as well.

## EVALUATION OF IMPLEMENTATION OF SHORT TERM SOLUTION

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<sup>7</sup> A copy of the caretakers confirmation that he would be responsible for implementing the project can be found in the Appendix.

<sup>8</sup> For a copy of the Student Life Officer's statement, see Appendix.

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### - Posters

Posters were put up with the aim to increase social incentive for individuals to use the racks, indicating the rewards of using the top rack. Positive feedback was received and posters have not been removed. However, the posters have not seemingly made a strong impact on defection rates.

### - Moving Defectors

By moving defector bicycles to free top rack spaces in the bicycle shed, we aimed to punish the defectors by increasing the time required for them to locate their bike, this in turn was hoped to act as a deterrent for defectors to repeat their defection again. Increasing awareness of the problem was a secondary aim, by using notes in place of the defector locations; bicycle users can see that there is a problem with bicycle defection. Finally, by moving defecting bicycles we reduce the problem, making the bicycle racks less hindered by defecting bicycles.

Moving defector bikes has been effective at resolving the problem. However, it required considerable investment by us in time removing and relocating bicycles and sticking notes in their place. It is difficult to say whether this solution has been successful at reducing the number of defectors. We have noticed a slow increase of defectors each day after we moved the defector bikes. This could be explained by the fact that some individuals are always going to defect unless the price of defection is considerably more than the price of cooperation. Importantly we have noticed that new defectors tend to be appearing between gaps in the racks, this may be considered acceptable by some, although it is still defection and causing issues for bicycle users.

It is important to note that there were some issues with moving defector bicycles.

- Firstly, a small number of bikes in the bike shed are oversized and do not fit easily in any racks. The individuals with these bicycles are very likely to defect as the time taken trying to fit their bicycles in the racks is much more than that for a normal bicycle.
- Secondly, some individuals have physical difficulty using the top racks, but there is no space on the bottom. We moved bicycles on to the top rack, but people may feel that they are not strong enough to sue the top rack, especially if they have a heavy bicycle.
- Finally, two defectors have locked their bicycles to static objects, making them unmovable. These defectors have therefore avoided the punishment of having their bicycles moved. This leads to an issue where the punishment has not applied to all, weakening its strength.

### - Facebook “Offender of the day”/”Boss of the day”

Facebook posts of pictures of a defecting bike and a well parked bike have been made daily using the LUC Confession Bear which is seen by many. This is aimed at pointing out the issue of badly parked bikes, and increasing the social pressure for bicycle shed users to cooperate. In addition, the public shaming can act as individual punishment to defectors if their bicycle is identified. Recently, on the 4/12/14, the offender of the day was identified by a fellow student.<sup>9</sup>

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<sup>9</sup> The entire Facebook conversation can be found in the Appendix.

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This led to the defector attempting to justify their defection; which shows that this solution has been effective to some degree. The conclusion of this Facebook conversation was there is no such thing as “my spot”. The defector is more likely to cooperate now that they know there is this risk of public shaming, and people are able to identify their bicycle.

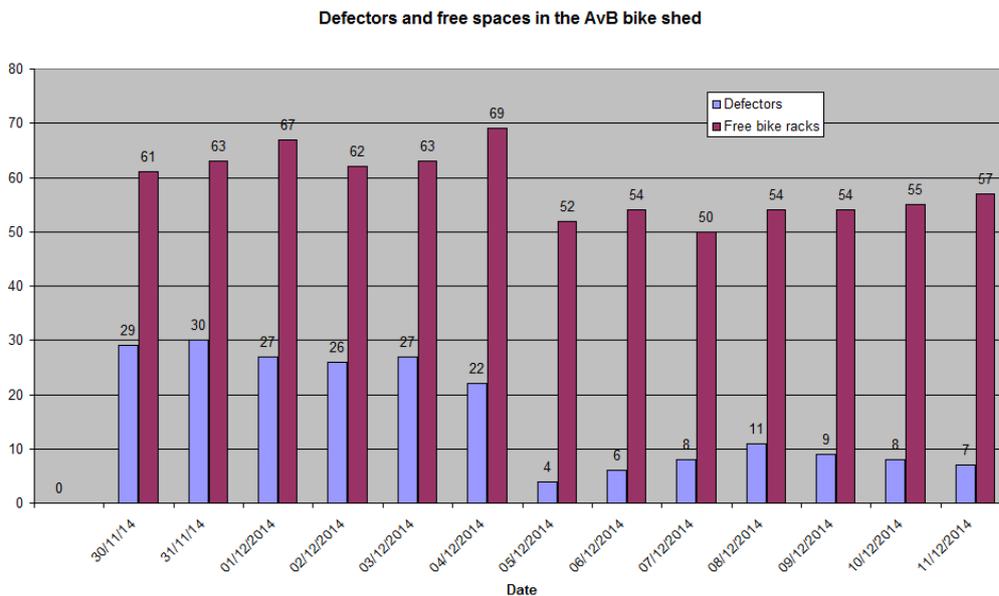
### RESULTS

The long term solution is yet to be implemented. Hence, we cannot discuss its results. We do expect, however, that once it gets implemented, it will reduce the number of erroneously parked bikes in a self-enforcing way.

The short term solution has successfully raised awareness of the necessity for social behaviour in the bike shed. The Facebook conversation included in the Appendix is one example of this. We have measured the number of defectors and free spaces in the bike shed from 30 November 2014 to 11 December 2014. The results of these measurements are presented below. Unfortunately, there has been no clear decrease in the number of defectors. In the bar graph below there seems to be a rapid decline in the number of defectors from 5 December onwards, but this can be explained by the bike removal strategy that was implemented on that day.

In order to say with some certainty to what extent the solutions proposed in this project have been successful, a greater number of measurements over a longer period of time is necessary. In any case, the responses coming from the community have generally been very positive.

Bar graph I.



### GROUP ORGANISATION

Following Olson’s theory that small groups work faster and more efficient than larger groups, we decided to divide the team into small sub-groups that were each tasked with one part of the project (Olsen, 1985). Although the

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group as a whole had already decided the strategy we would follow to solve the CPR issue, the individual sub-groups had a fairly large degree of autonomy regarding the interpretation and implementation of their task.

### Sub-groups

#### 1) The promotion group

This team was in charge of counting the cooperators/ defectors, designing and spreading the posters and posting images of correctly/falsely parked bikes on Facebook.

#### 2) The communications group

This team handled the meetings with the concierge and the course instructor, and facilitated the collaboration/communication between the group and the other stakeholders.

#### 3) The report group

This team kept track of all the small group activities so that everyone was updated on the project progress. They were also in charge of writing (the draft version of) the final project report.

By organising ourselves in smaller groups it was clear to everyone what their tasks and responsibilities were, and we did not have to meet with the entire group for a minor issue. In order to facilitate communication among the group members, a Facebook group page was created that allowed the team to keep each other updated and share documents easily. The Facebook page was intensively used and proved to be an effective tool for communication and discussion within the group.

## BIBLIOGRAPHY

Olson, Mancur (1965), *The Logic of Collective Action*. Harvard University Press. ISBN 0-674-53751-3

Ostrom, Gardner and Walker (1994). *Rules, Games, and Common-Pool Resources*. Ann Arbor Books

## APPENDIX

Figure I.

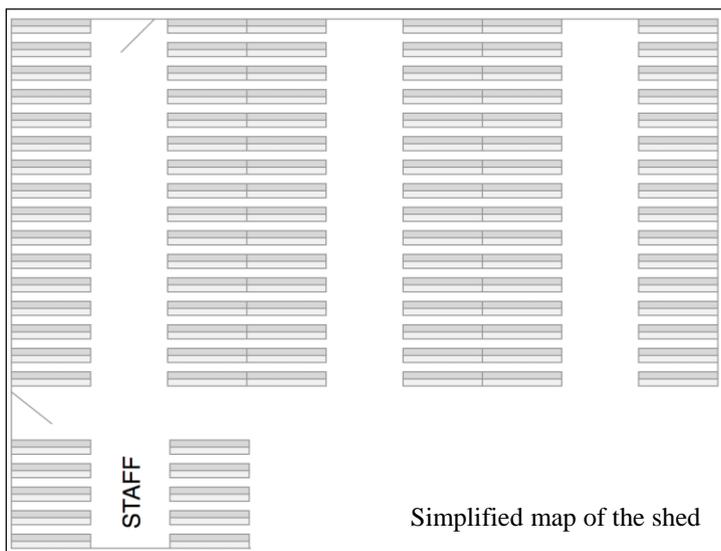


Figure II. Retrieved from Berluba.be.



Posters:

**Put your bike in the rack or the Grinch will steal your Christmas presents**



**Are you a rebel that parks their bike outside the rack?**  
**Think again!**



**Are you somebody that leaves their bike lying around?**



**DON'T**

**There's 1440 minutes in a day...**

**It takes about a minute to put your bike away.**



**Why use the gym when you can stay in the bubble?**  
**Use the top bike rack.**



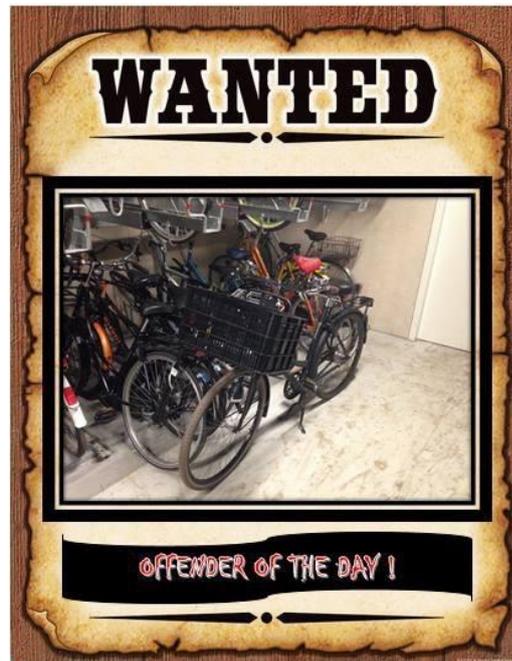
**10 reasons to lift weights**

1. Reduces Stress
2. Strengthens Bones
3. Lowers Your Diabetes Risk
4. Better Heart Health
5. Better Blood Sugar Control
6. Prevents Back Pain
7. Improves Balance
8. It Will Make You Mentally Stronger
9. Releases Endorphins
10. Improves Your posture

**Put your bike in the top rack!**



Offender/Hero of the Day Campaign:



Caretaker's confirmation:

Dear Niki and Rogier,

Following up on the students' project to tackle the bike room problems, we have come up with the idea of giving each floor a colour code and designated section in the bike room. We hope for students' self regulation in sticking to their own section.

A possible way of marking the bikes would be with simple key tags attached to the bikes. For 21 floors, we need 7 colours to come up with 21 unique colour codes, and 14 tags of each colour. The bike racks could be marked with "afzetlint" in matching colours.

7\*150 bike labels (to have some spare of each colour)\* 6 cents  
63 euros

7\* coloured "afzetlint" (250m, more than enough) \* 19.25  
134,75

500 tie wraps to attach the labels to bikes  
30,00

Some broad sticky tape to affix the afzetlint

leading to a total cost of xxx (not including BTW) plus some hours to spread the labels and mark the bike racks.

Let me know what you think!

Best, Mehdi

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The Student Life Officers statement in student life email 11/11/14:

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"Non-AvB Students and Your Fiets. This is a reminder from our caretaker to students who do not live in AvB but take courses there. You are not to park your bicycle in the Bike Room (there are only enough spaces for residents of AvB and the staff). Per the house rules, you are also not to park your bikes immediately outside of AvB; as you have probably noticed, these bicycles have been and will continue to be moved. They block egress from the building. You must find a suitable place to park your bicycle, even if it is away from the building."

Facebook conversation (identified defector):



The screenshot shows a Facebook post from 'Luc Confession Bear' dated 4 December. The post features a collage of three images: a woman with glasses and a surprised expression, a bicycle parked in a hallway, and a Santa Claus illustration. A black banner with the text 'OFFENDER OF THE DAY!' is overlaid on the bottom of the collage. The post has received several comments and likes. The comments are as follows:

- Robbert van Tilborg, Iris Geigenmuller, Ashley Chin and 4 others like this.
- Diederik van den Burger: Whahahaha, that baby ❤️ (4 December at 21:00 · Like · 4)
- Enya Segura: [redacted]!!!! Sorry but have to 'BIKE-SHAME' you in front of everyone (4 December at 21:37 · Like · 1)
- [redacted]: Jup that's me. No regrets! Someone took my standard spot on one of the higher levels. And I am very picky about my spot. So if people would stop stealing my spot that'd be great... (4 December at 21:47 · Like · 4)
- [redacted]: BTW how do you know what bike is mine Enya Segura? I put it back on MY spot (4 December at 21:52 · Like)
- Enya Segura: hahaha ❤️ coming back to AvB last night 😊 (4 December at 21:56 · Like)
- Davimio Dwarakasingh: There is no concept as "my spot" it's a first come first serve basis (4 December at 23:01 · Like · 2)
- [redacted]: Davimio Dwarakasingh I am well aware. It was a joke (4 December at 23:06 · Like · 3)

The bottom of the screenshot shows the Facebook footer with links for About, Create Advert, Create Page, Developers, Careers, Privacy, Cookies, Terms, and Help.