Thesis 187

# The use of lights on the bicycles : cyclists' perception on safety

## - a case study in Lund

Pitra Setiawan
2009

Lund Institute of Technology
Department of Technology and Society
Traffic and Roads

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Thesis CODEN:LUTVDG/(TVTT-5154)1-92/2009

Thesis / Lunds Tekniska Högskola, ISSN 1651-1182
Instutionen för Teknik och samhälle,
Trafik och väg, 187

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*Keywords:*
cyclists, bicycle safety, safety perception, missing lights, Lund

*Abstract:*
To ensure safety among the cyclists, some regulations related with cycling are in force by Swedish authorities including the obligation of bicyclist to use the light for bicycle during the night. However, in the implementation there are still a lot of cyclists who do not use lights when cycling at night or even if they use the lights, only the front lights are used. This is, of course dangerous to the safety of the cyclists because other road users especially motorized-vehicle drivers are not aware of their existence.
Bicycle traffic counts, behaviour studies and interviews with the cyclists are conducted. The bicycle counts were carried out for 15 minutes period started from 21.00. For the behaviour studies, it was conducted every 15 minutes periods for 2 hours from 21.00 until 23.00. The interviews with the cyclists took place in five different locations, the locations that are the same as for behaviour observations
The final conclusion is that the economical factor is not the factor that determined the use of bicycle lights. It is also found that cyclists have already known their obligations to use the lights. From the interview result, it is shown that most cyclists believe that the function of the light is as an existence marker (to be seen) not to see the way during darkness.

*Citation:*
Setiawan P., The use of lights on the bicycles: cyclists' perception on safety - a case study in Lund. Lund University, Lund Institute of Technology, Department of Technology and Society, 2009. Thesis 187

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# Preface

Studying in Lund University was one of my greatest experiences. Lund University has good reputation in education and research. So many knowledge that were obtained here that could be applied when I returned to my country.

First of all I would like to thank to Indonesian Government who had given me the opportunity to study in Lund. I also would like to thank all people in the Department of Technology and Society of LTH. Special thanks to my supervisor Prof. András Várhelyi for his excellent help and support, to Rune Peterson from Swedish National Police College and Peter Håkansson from Lund Municipality for giving useful information about cyclists' regulations.

Lund, 2009

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Pitra Setiawan

# TABLE OF CONTENTS

SUMMARY ---------- 1

I. INTRODUCTION ---------- 2

1.1. Background ---------- 2
1.2. Objective ---------- 3
1.3. Scope ---------- 3
1.4. Hypotheses ---------- 3

II. METHODS AND MATERIALS ---------- 5

2.1. Research Steps ---------- 5

2.2. Literature Studies ---------- 6

2.3. The Sites ---------- 7
*2.3.1. Sites Selection* ---------- 7
*2.3.2. Site Description* ---------- 11
*2.3.2.1. Lilla Fiskaregatan* ---------- 11
*2.3.2.2. Trollebergsvägen (Bantorget)* ---------- 12
*2.3.2.3. Bredgatan-Allhelgonakyrkan* ---------- 12
*2.3.2.4. Tunavägen-Sångarevägen* ---------- 12
*2.3.2.5. Stora Södergatan - Södra Esplanaden* ---------- 13

2.4. Field Observations ---------- 13
*2.4.1. Bicycle Volumes* ---------- 13
*2.4.2. Behaviour Studies* ---------- 13
*2.4.3. Interviews with cyclists* ---------- 14
*2.4.3.1. Respondents* ---------- 15
2.4.3.2. *Questions* ---------- 15

III. RESULTS ---------- 17

3.1. Literature Studies Results ---------- 17
*3.1.1. Bicycle in General* ---------- 17
*3.1.2. Bicycle Regulations in Sweden* ---------- 18
*3.1.2.1. Cyclists' obligation to use lights and reflectors* --------- 18
*3.1.2.2. Penalty* ---------- 20
*3.1.3. Bicycle in Lund* ---------- 20
*3.1.4. Interviews* ---------- 22

3.2. Field Observations Results ---------- 24
*3.2.1. Results from Behaviour Study* ---------- 24
*3.2.1.1. Bredgatan-Allhelgonakyrkan* ---------- 24
*3.2.1.2. Stora Södergatan-Södra Esplanaden* ---------- 28
*3.2.1.3. Tunavägen – Sångarevägen* ---------- 31
*3.2.1.4. Trollebergsvägen (Bantorget)* ---------- 35
*3.2.1.5. Lilla Fiskaregatan* ---------- 39
*3.2.1.6. Summary from Behaviour Study* ---------- 42
*3.2.2. Results from Interviews* ---------- 45

IV. DISCUSSION AND CONCLUSION ---------- 50

V. REFERENCES ---------- 54

VI. APPENDICES ---------- 57

# TABLE OF APPENDIX

Appendix 1: Behaviour study protocol ---------- 57
Appendix 2: Behaviour study at Allhelgonakyrkan ---------- 58
Appendix 3 : Behaviour study at Stora Södergatan ---------- 61
Appendix 4: Behaviour study at Tunavägen – Sångarevägen ------- 63
Appendix 5: Behaviour study at Trollebergsvägen (Bantorget) ------ 65
Appendix 6: Behaviour study at Lilla Fiskaregatan ---------- 69
Appendix 7: Missing Reflectors and Gender in Allhelgonakyrkan -- 73
Appendix 8: Missing Lights and Gender in Allhelgonakyrkan -------- 73
Appendix 9: Helmet Use and Gender in Allhelgonakyrkan ---------- 73
Appendix 10: Helmet Use and Missing Lights in Allhelgonakyrkan -- 73
Appendix 11: Missing Lights and Direction in Allhelgonakyrkan ------ 73
Appendix 12: Missing Reflectors and Direction in Allhelgonakyrkan 73
Appendix 13: Missing Reflectors and Gender in Stora Södergatan - 74
Appendix 14: Missing Lights and Gender in Stora Södergatan ------- 74
Appendix 15: Helmet Use and Gender in Stora Södergatan ---------- 74
Appendix 16: Helmet Use and Missing Lights in Stora Södergatan - 74
Appendix 17: Missing Lights and Direction in Stora Södergatan ----- 74
Appendix 18: Missing Reflectors and Direction in Stora Södergatan 74
Appendix 19: Missing Reflectors and Gender in Tunavägen - Sångarevägen ---------- 75
Appendix 20: Missing Lights and Gender in Tunavägen – Sångarevägen ---------- 75
Appendix 21: Helmet Use and Gender in Tunavägen - Sångarevägen ---------- 75
Appendix 22: Helmet Use and Missing Lights in Tunavägen - Sångarevägen ---------- 75
Appendix 23: Missing Lights and Direction in Tunavägen - Sångarevägen ---------- 75
Appendix 24: Missing Reflectors and Direction in Tunavägen - Sångarevägen ---------- 75

Appendix 25: Missing Reflectors and Gender in Trollebergsvagen--- 75
Appendix 26: Missing Lights and Gender in Trollebergsvagen -------- 76
Appendix 27: Helmet Use and Gender in Trollebergsvagen ---------- 76
Appendix 28: Helmet Use and Missing Lights in Trollebergsvagen -- 76
Appendix 29: Missing Lights and Direction in Trollebergsvagen ------ 76
Appendix 30: Missing Reflectors and Direction in Trollebergsvagen 76
Appendix 31: Missing Reflectors and Gender in Lilla Fiskaregatan - 77
Appendix 32: Missing Lights and Gender in Lilla Fiskaregatan -------- 77
Appendix 33: Helmet Use and Gender in Lilla Fiskaregatan ---------- 77
Appendix 34: Helmet Use and Missing Lights in Lilla Fiskaregatan - 77
Appendix 35: Missing Lights and Direction in Lilla Fiskaregatan ----- 77
Appendix 36: Missing Reflectors and Direction in Lilla Fiskaregatan 77
Appendix 37: Interview Protocol ---------- 78
Appendix 38: Interviews Results ---------- 79
Appendix 39: Basic Data of Interviewees – Gender ---------- 81
Appendix 40: Basic Data of Interviewees – Age ---------- 81
Appendix 41: Frequency ---------- 81
Appendix 42: Lights Function ---------- 81
Appendix 43: Lights' Price ---------- 81
Appendix 43: Cyclists knowledge about regulation ---------- 81

# TABLE OF FIGURES

Figure 2.1. Research Flow Chart ---------- 6
Figure 2.2. Six areas in Lund, where urban cyclists have been counted 1992 – 2008 ---------- 7
Figure 2.3. 15-minute counts result – Gender ---------- 9
Figure 2.4. Locations of the selected sites ---------- 11
Figure 3.1. Bicycle with complete equipments as regulated in Swedish Road Traffic Act and Regulations ---------- 19
Figure 3.2. Lund City Center ---------- 22
Figure 3.3. Missing Lights in relation with Gender in Bredgatan-Allhelgonakyrkan---------- 25
Figure 3.4. Missing Reflectors in relation with Gender in Bredgatan-Allhelgonakyrkan---------- 26
Figure 3.5. Missing Lights in relation with Direction in Bredgatan-Allhelgonakyrkan---------- 26
Figure 3.6. Missing Reflectors in relation with Direction in Bredgatan-Allhelgonakyrkan---------- 27
Figure 3.7. Helmets use in relation with Bicycle Lights use in Bredgatan-Allhelgonakyrkan---------- 27
Figure 3.8. Missing Lights in relation with Gender in Stora Södergatan-Södra Esplanaden ---------- 29
Figure 3.9. Missing Reflectors in relation with Gender in Stora Södergatan-Södra Esplanaden ---------- 29
Figure 3.10. Missing Lights in relation with Direction in Stora Södergatan-Södra Esplanaden ---------- 30
Figure 3.11. Missing Reflectors in relation with Direction in Stora Södergatan-Södra Esplanaden ---------- 30
Figure 3.12. Helmets use in relation with Bicycle Lights use in Bredgatan-Allhelgonakyrkan---------- 31
Figure 3.13. Missing Lights in relation with Gender in Tunavägen-Sångarevägen ---------- 32
Figure 3.14. Missing Reflectors in relation with Gender in Tunavägen-Sångarevägen ---------- 33
Figure 3.15. Missing Lights in relation with Direction in Tunavägen-Sångarevägen ---------- 33

Figure 3.16. Missing Reflectors in relation with Direction in Tunavägen-Sångarevägen ---------- 34
Figure 3.17. Helmets use in relation with bicycle lights use in Tunavägen-Sångarevägen ---------- 34
Figure 3.18. Missing Lights in relation with Gender in Trollebergsvägen (Bantorget) ---------- 36
Figure 3.19. Missing Reflectors in relation with Gender in Trollebergsvägen (Bantorget) ---------- 36
Figure 3.20. Missing Lights in relation with Direction in Trollebergsvägen (Bantorget) ---------- 37
Figure 3.21. Missing Reflectors in relation with Direction in Trollebergsvägen (Bantorget) ---------- 38
Figure 3.22. Helmets use in relation with bicycle lights use in Trollebergsvägen (Bantorget) ---------- 38
Figure 3.23. Missing Lights in relation with Gender in Lilla Fiskaregatan ---------- 40
Figure 3.24. Missing Reflectors in relation with Gender in Lilla Fiskaregatan ---------- 40
Figure 3.25. Missing Lights in relation with Direction in Lilla Fiskaregatan ---------- 41
Figure 3.26. Missing Reflectors in relation with Direction in Lilla Fiskaregatan ---------- 41
Figure 3.27. Helmets use in relation with bicycle lights use in Lilla Fiskaregatan ---------- 42
Figure 3.28 Basic Information of Respondents ---------- 45
Figure 3.29. Question 1 ---------- 46
Figure 3.30. Question 2 ---------- 47
Figure 3.31. Question 3 ---------- 48
Figure 3.32. Question 4 ---------- 49

# LIST OF TABLES

Table 2.1. Locations with high number of cyclists in each zones in Lund ---------- 8
Table 2.2. Bicycle volume at 15-minutes counts ---------- 9
Table 2.3. Selected Sites for field observations in Lund ---------- 10
Table 2.4. Short description of interviews ---------- 16
Table 3.1. Observation Result - Bredgatan-Allhelgonakyrkan ------- 24
Table 3.2. Observation Result - Stora Södergatan – Södra Esplanaden ---------- 28
Table 3.3. Observation Result - Tunavägen-Sångarevägen --------- 32
Table 3.4. Observation Result - Trollebergsvägen (Bantorget) ----- 35
Table 3.5. Observation Result - Lilla Fiskaregatan ---------- 39
Table 3.6. Total number of cyclists observed ---------- 42
Table 3.7. Nr. of missing light cyclists ---------- 43
Table 3.8. Missing Lights and Gender ---------- 43
Table 3.9 Missing Lights and Direction ---------- 43
Table 3.10. Helmets Use and Gender ---------- 44
Table 3.11. Helmets Use and Missing Lights ---------- 44

# Summary

City of Lund has a good infrastructure and facilities for cyclists. Nowadays the city of Lund has become one of the city in Sweden with high number use of bicycle.

To ensure safety among the cyclists, some regulations related with cycling are in force including the obligation of bicyclist to use the light for bicycle during the night. However, in the implementation there are still a lot of cyclists who do not use lights when cycling at night or even if they use the lights, only the front lights are used. This is, of course dangerous to the safety of the cyclists because other road users especially motorized-vehicle drivers are not aware of their existence.

Bicycle traffic counts, behaviour studies and interviews with the cyclists are conducted. The bicycle counts were carried out for 15 minutes period started from 21.00. For the behaviour studies, it was conducted every 15 minutes periods for 2 hours from 21.00 until 23.00. The interviews with the cyclists took place in five different locations, the locations that are the same as for behaviour observations. It interviewed 100 cyclists that passed through the locations.

The results showed that price factor is not the factor that determined the use of bicycle lights. It is also found that cyclists have already known their obligations to use the lights but during the observations, 72% of the cyclists did not use the lights properly as regulated in Swedish Road Traffic Act and Regulations. It is likely influenced by the perception that the cyclists have about the regulations. The interview results show that most cyclists believe that the function of the light is as an existence marker (to be seen) not to see the way during darkness.

# I. INTRODUCTION

## 1.1. Background

Lund has a long university tradition and a good reputation for studying both technical and social sciences. The city of Lund has become the centre of education and research centre with international reputation. Researches done in the university have been applied in city development, including developing better and more 'user friendly' bicycle paths in and around the city. With good infrastructure and facilities, nowadays the city of Lund has become one of the cities in Sweden with high number of use of bicycle.

To ensure safety among the cyclists, some regulations related with cycling have been issued by Swedish authorities including the obligation of bicyclists to use the lights for bicycle during darkness. Swedish Road Traffic Act and Regulations ordered all vehicles, including bicycles, to have a lamp showing white or yellow light at the front and showing a red light at the back of the vehicles (Trafikförordning, 1998:1276, Chapter 3, Article 73). However, on the implementation of these regulations, there are still a lot of cyclists who do not use lights when cycling at night or even if they use the lights, only the front lights are used. This is, of course dangerous to the safety of the cyclists because other road users especially motorized-vehicle drivers are not aware of their presence.

The interactions between cyclists and other road users are complex phenomenon. Not only infrastructures and facilities factors that influencing traffic safety but also cyclists behaviour. Cyclists' level of knowledge about the traffic regulation also play an important role on how they behave.

Road users have to consider the presence of other road users, as they have to share the same space even if they have to manage their own movement. To increase other road users' awareness of the cyclists' presence, cyclists have to make sure that their bicycles are fully equipped with safety devices in accordance with prevailing regulations, in this case is Swedish Road Traffic Act and Regulations.

In the autumn of 2008, a campaign to promote the use of bicycle lights has been done by Lund Municipality (Håkansson, 2009). It observed 926 cyclists in 5 different locations in Lund City and resulted 55% of cyclists used both front and rear lights. Unfortunately, there are no further explanations why those matters could happen.

## 1.2. Objective

The aim of this research is to analyze cyclists' compliance with rules on lighting during darkness. Since there are no further explanations from the previous research about cyclists' behaviour in using lights during darkness, why the behave in such a way, then this research will evaluates the use of lights on the bicycle.

To obtain a complete understanding how this situation has emerged, this research also focuses on the cyclists' perception and their interpretation about regulation related with safe cycling during darkness.

## 1.3. Scope

In order to remain consistent to the objectives, the research is limited only in cyclists' behaviour related with the use of lights on their bicycles during darkness. Investigating the use of front lights and / or rear lights is included in this research. It also observes the availability of retro-reflector used on bicycles.

## 1.4. Hypotheses

The main hypotheses behind this research are as follow:

1. *More than fifty percent cyclists do not use lights;*

   There are a lot of number of cyclists in Lund City but there are also many cyclists who do not use lights during their trips in darkness periods. This is, of course dangerous to the safety of cyclists.

2. *Cyclists do not use lights because of economical reasons;*

   Huge number of students from various countries that are enrolled in Lund University have made the user of the bicycle consists of various cultures, various habit and various level of the economic ability. This will influence cyclists' ability to provide bicycle lamps in accordance with the regulations.

3. *Cyclists do not use lights because they do not know about regulations related with the cyclists' obligation to use the lights during darkness;*

   A lot of people from around the world have come to Lund to study in here and many of them are only able to speak English and not Swedish. For cyclists who are not originally from Sweden, it is difficult to understand the regulations related with cycling since it is written in Swedish.

4. *There are different perceptions on the use of lights on the bicycles as an illumination tool or just as an existence marker of the cyclists;*

   According to regulations, bicycle lights shall have such brightness so the cyclist could see the road surface forwards at a reasonable distance. In order to drive safely the light must be that other road users could see the on-coming cyclists in a reasonable distance. In the implementation, many cyclists use the lights just as a marker of the cyclists' existence.

# II. METHODS AND MATERIAL

## 2.1. Research Steps

To achieve the prescribed objective, a flow chart is formed (see Figure 2.1). From the flow chart it can be seen that this research begins from background, identification of the problems and objectives.

Once the problems and objectives are identified the next step is to make literature studies. It provides a deep understanding of cycling problem during darkness. Swedish cycling regulations are also explained.

Furthermore, the protocols for interviewing cyclists are elaborated and tested. If in preparation test, the protocols were discovered that they could not be applied then it led to a change either layout or questions, which was tested again until it, came up with satisfactory results.

The next step after having an applicable protocol is data collecting through field observations which was followed by data processing. Those data are then analyzed followed by discussion of the problems.

This research is closed with some conclusions and recommendations are made based on the results of the research.

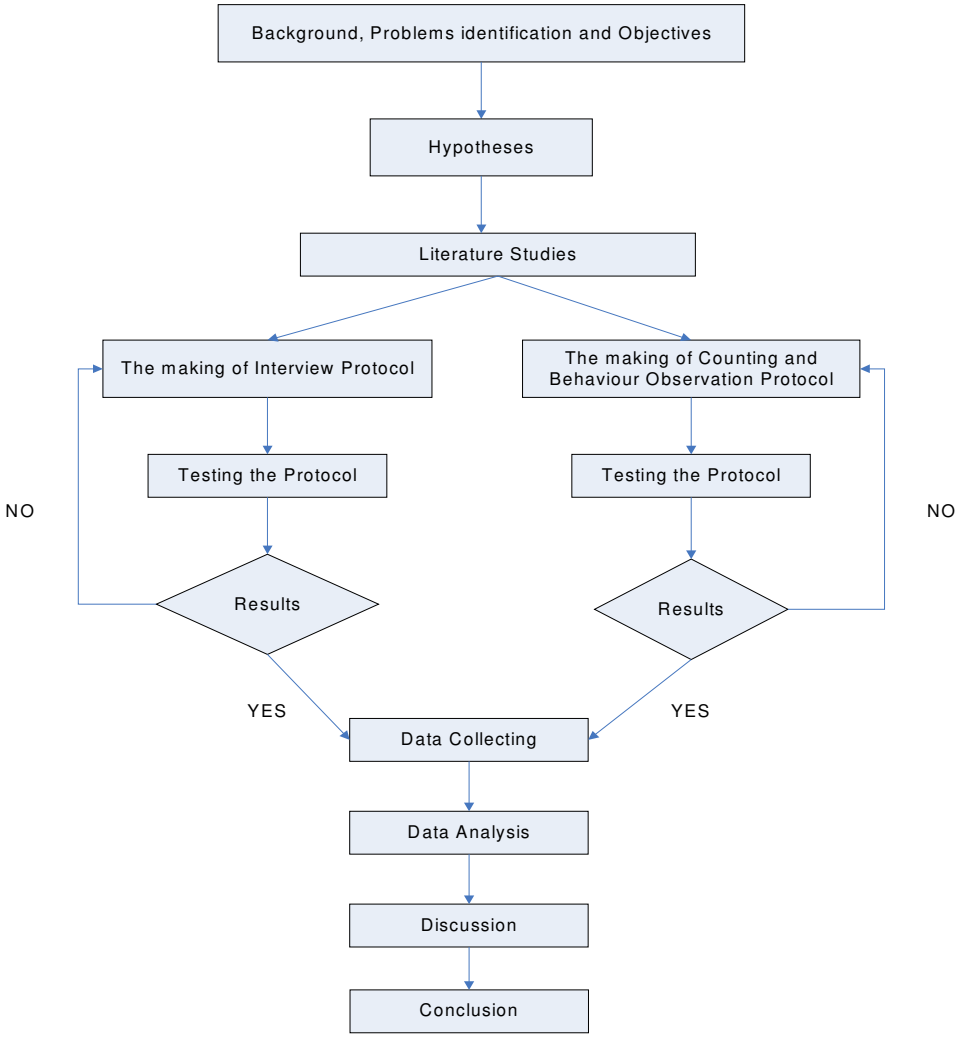



Figure 2.1. Research Flow Chart

## 2.2. Literature Studies

The aim of the literature studies is to study the fundamental elements of cycling. Cycling is the same in everywhere, what distinguished cycling in one place with the other place is the regulation. The regulation in the country that gave priority to cyclists certainly will be different from the regulation in another place that did not give the priority to cyclists.

Therefore, the literature studies shall begin with the understanding of the cycling and things, both conditions and equipments, which affect the safety of cyclists. Furthermore, during the literature studies there is a closer look into the subject of Swedish regulation especially with cycling during darkness.

All sources in this literature studies include books and electronic publications such as papers and articles. All of them are available for everyone and can be found in Lund University's Library or in the internet.

## 2.3. The Sites

### 2.3.1. Sites Selection

In a report on pedestrians and cyclists, Lund Municipality in cooperation with the Trivektor - Traffic AB, counted cyclists flow in 80 places in six different zones in Lund. As for 6 zones which comprise the city of Lund are (Lunds Kommun, 2009a):

1. Centrum
2. Klostergården mm
3. Gunnesbo mm
4. Norra Fäladen mm
5. Vipeholm mm
6. Nilstorp mm

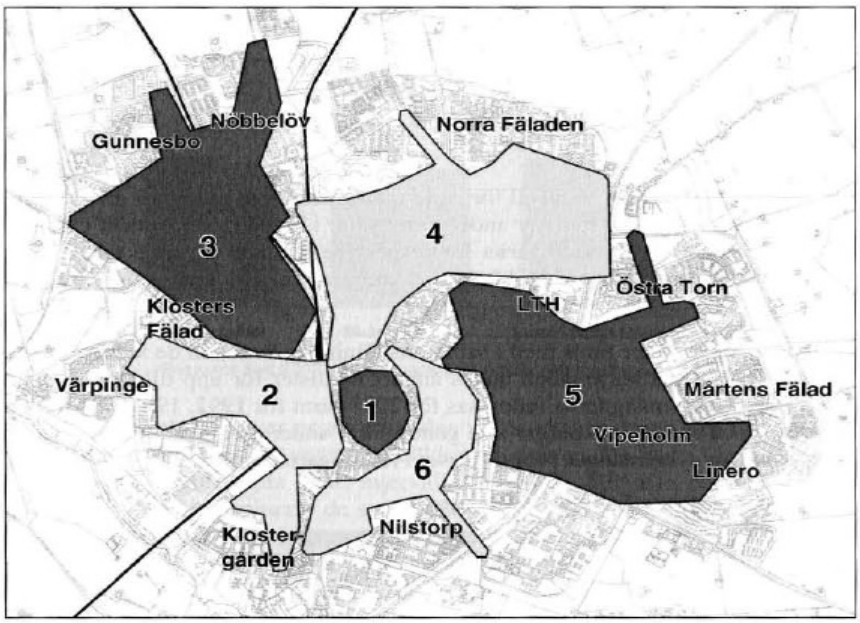



Figure 2.2. Six areas in Lund, where urban cyclists have been counted 1992–2008 (Source: Lunds Kommun, 2009a)

From those countings there are three locations in each zone that have the largest number of cyclists:

Table 2.1. Locations with high number of cyclists in each zone in Lund
(Source: Lunds Kommun, 2009a)

| Zone | Name | Code | Location | Cyclists' volume per day |
|---|---|---|---|---|
| 1 | Centrum | 103 | Lilla Fiskaregatan | 6100 |
| | | 106 | Kyrkogatan | 5400 |
| | | 101 | Stora Södergatan | 4200 |
| 2 | Klostergarden | 201 | Trollebergsvägen (Bantorget) | 6800 |
| | | 204 | Trollebergsvägen - Byggsmästaregatan | 5200 |
| | | 215 | Svanegatan | 3300 |
| 3 | Gunnesbo | 301 | Kung Oskar Väg | 3000 |
| | | 306 | Fjelievägen | 2500 |
| | | 325 | GC-väg mot Lerbäckskolan | 1800 |
| 4 | Norra Fäladen | 403 | Gettingevägen | 4500 |
| | | 402 | Bredgatan-Allhelgonakyrkan | 3700 |
| | | 412 | Delfinvägen | 4700 |
| 5 | Vipeholm | 502 | Tunavägen-Tornavägen | 5000 |
| | | 519 | Tunavägen-Sångarevägen | 4000 |
| | | 520 | Tunavägen – Ole Römers väg | 2800 |
| 6 | Nilstorp | 601 | Stora Södergatan - Södra Esplanaden | 3300 |
| | | 611 | Dalbyvägen | 2300 |
| | | 605 | Malmövägen | 2000 |

Although the locations with the highest number of cyclists in the city of Lund has been known, it should be understood that not all locations have the same number of cyclists during night and day period. Therefore, preliminary survey is needed to find out the location in which the research can be carried out.

The bicycle volume counts were conducted to find out which locations have high number of bicycles so that the research can be conducted. The counts were carried out for 15 minutes starting from 21:00 hrs until 21:15 hrs. There is no standard in determining the number of cyclists that can be used as a guidance to select the location. However it is expected that at least 15 cyclists were obtained in this 15-minute period of counts. Location with 1 cyclist passed through every minute was chosen to be the observation location.

The counts were carried out in seven locations which were obtained from Lund Municipality Report. Table 2.2. below shows the results from preliminary counts.

Table 2.2. Bicycle volume at 15-minutes counts

| Location | Time | Total Cyclists | Gender | | % | |
|---|---|---|---|---|---|---|
| | | | M | F | M | F |
| Stora Södergatan | 21.00 - 21.15 | 18 | 8 | 10 | 44 | 56 |
| Trollebergsvägen (Bantorget) | 21.00 - 21.15 | 30 | 17 | 13 | 57 | 43 |
| Kung Oskar Väg | 21.00 - 21.15 | 15 | 5 | 10 | 33 | 67 |
| Gettingevägen | 21.00 - 21.15 | 12 | 7 | 5 | 58 | 42 |
| Bredgatan-Allhelgonakyrkan | 21.00 - 21.15 | 20 | 4 | 16 | 20 | 80 |
| Tunavägen-Tornavägen | 21.00 - 21.15 | 14 | 5 | 9 | 36 | 64 |
| Tunavägen-Sångarevägen | 21.00 - 21.15 | 26 | 8 | 18 | 31 | 69 |

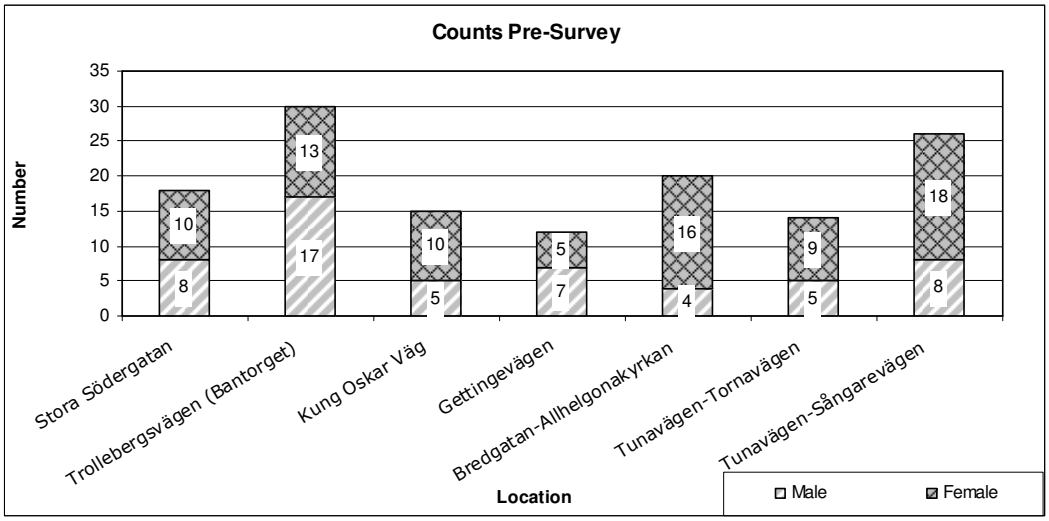



Figure 2.3. 15-minute counts result – Gender

From the table 3.1. it can be seen that the number of cyclist in this location varied between 12 and 30. Location Trollebergsvägen (Bantorget) have the highest number of bicycles, this is determined by its location in the centre of the city (see chapter 2.2.2.2. for detailed description).

From Lunds Municipality Report (2009a) it noted that Gettingevägen has a large number of bicycle volume which is approximately 4500 cyclists per day. However, after the 15-minute counts on that location, the result showed not so many cyclists passing through this location. Therefore, the research was conducted in Bredgatan-Allhelgonakyrkan that has more number of cyclists at night than Gettingevägen.

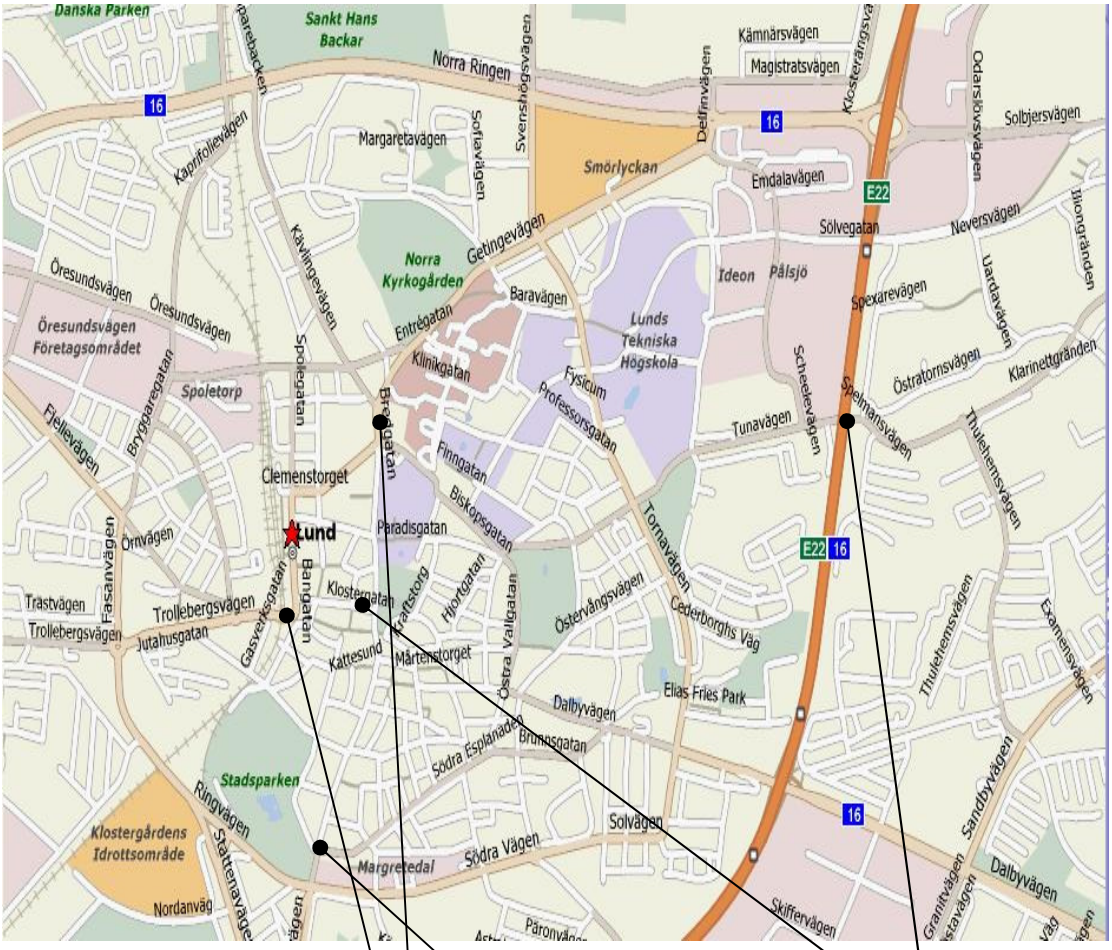
The same thing applies to the Tunavägen-Tornavägen. During the day, a lot of cyclists passing through this location either going to the university or returning home from university. This location was also one of the routes that were used by the students from Sparta –student apartments and hotel- towards the city or vice versa. But during the night not so many cyclists passing through this location.

The contrary result was shown by the location of Tunavägen-Sångarevägen. From the results of the 15-minute counts, the number of cyclists who pass through this location is more than Tunavägen-Tornavägen. Therefore, the location Tunavägen-Sångarevägen are selected for this research.

However for zone 3 – Gunnesbo, there were no locations with high number of cyclists during darkness so that observations can not be done in zone 3 (see chapter 3.2.1.).

Table 2.3. Selected Sites for field observations in Lund

| Nr | Zone | Name | Code | Location | Cyclists Flow |
|---|---|---|---|---|---|
| 1 | 1 | Centrum | 103 | Lilla Fiskaregatan | 6100 |
| 2 | 2 | Klostergarden | 201 | Trollebergsvägen (Bantorget) | 6800 |
| 3 | 4 | Norra Fäladen | 402 | Bredgatan-Allhelgonakyrkan | 3700 |
| 4 | 5 | Vipeholm | 519 | Tunavägen-Sångarevägen | 4000 |
| 5 | 6 | Nilstorp | 601 | Stora Södergatan - Södra Esplanaden | 3300 |




Stora Södergatan - Södra Esplanaden--
Trollebergsvägen (Bantorget)--
Bredgatan-Allhelgonakyrkan ----

Lilla Fiskaregatan -----
Tunavägen-Sångarevägen--

Figure 2.4. Locations of the selected sites (source: www.mapquest.com)

## 2.3.2. Site Description

### 2.3.2.1. Lilla Fiskaregatan

Lilla Fiskaregatan is a commercial street in downtown of Lund. It connects two important squares, Bantorget and Stortorget and also two main streets of the city, S. Södergatan and Bangatan. There are banks and several kinds of stores, which are open from 10.00-18.00.

Lilla Fiskaregatan is a pedestrian street where cyclists are allowed during all the day and motorized vehicles are not allowed to enter this street. Before 1980 Lilla Fiskaregatan was a motorized street but then motor vehicles were restricted there (Santmiquel, 2004).

It is designed with a pedestrian zone in both sides of the street and a cycle path in the middle of the street. Lilla Fiskaregatan has a high number of cyclists, 6100 cyclists per day in 2008 (Lunds Kommun, 2009a).

#### 2.3.2.2. Trollebergsvägen (Bantorget)

Trollebergsvägen is an arterial road that connects the city centre with different area of suburb – Varpinge. This road has a mixed pathway for pedestrians and cyclists in both sides. The observation was conducted near central station and Bantorget. Shops and residential areas dominate the surrounding of both central station and Bantorget and generate people's activities. There are also Grand Hotel in front of Bantorget. Because of those strategic reasons, this place has a high number of cyclists, 6800 cyclists per day in 2008 (Lunds Kommun, 2009a).

#### 2.3.2.3. Bredgatan-Allhelgonakyrkan

Bredgatan connects northern area with Centrum area. There are central station and stortorget on one side, which become the centre of Lund and hospitals and dwelling areas especially for students living in the north (Delphi) on the other side. A lot of cyclists are passing through this road during peak hours in both direction, to central station and to hospital. In the evening, although it is not peak hours there are still a lot of cyclists in this road especially coming from central station.

#### 2.3.2.4. Tunavägen-Sångarevägen

This place is located near SPARTA -students apartments and hotel- and ASTRA ZANECA, a Swedish office. This road connects SPARTA area, which is considered as university and students' area, with Östra Torn and Linero which is known as residential area.

There is a big supermarket in SPARTA, which is open from 7.00-22.00. It means that the existence of this supermarket also generates cyclists in this road in the evening or during darkness. Based on Lund Kommun (2009a), there are 4000 cyclists per day during 2008.

#### 2.3.2.5. Stora Södergatan - Södra Esplanaden

This road connects Lund city centrum with other suburbs areas such as Klostergården area and Nilstorp area. It also becomes an entry point from Hjärup to Lund City. Located near students dwellings (Paranthesen, Gylleholm, Ulrikedal) make students dominate the characteristic of cyclists in this place.

## 2.4. Field Observations

The field observations were conducted between April 23rd, 2009 and May 8th, 2009 in Lund City at five different sites (see chapter 2.2.1. for detail explanation about sites selection). They consists of 20 hours of observations and all of them were done during darkness, from the dusk at about 9.00 PM until 11.00 PM. The weather was always dry.

### 2.4.1. Bicycle Volumes

The bicycle counts were carried out to determine the locations where the research can be conducted. The chosen locations where the counts were carried out were from Lunds Municipality (2009a) (see table 2.3.).

It was conducted for 15 minutes period started from 21.00. The observation was begun at 21 o'clock because after 21.00 the situation has been dark enough that cyclists required to use light.

### 2.4.2. Behaviour Studies

To test the hypotheses, a study is realized to observe the cyclists' behaviour during darkness related with the use of lights on the bicycle.

The studies were conducted every 15 minutes periods for 2 hours from 21.00 until 23.00. This study was carried out between May 23rd 2009 - May 29th 2009 when the dusk began at 20.20.

When developing the observations protocol, a pre-test survey was made to test the protocol before it got its final form. The final protocol can be seen in the Appendix 1.

Observation about "missing lights" and "missing reflectors" was used in this behaviour studies rather than observation about the existence of lights and reflectors. When testing the protocol, it was known that observation about "missing lights" and "missing reflectors" was easier to be carried out than the other observations.

According to Swedish Road Traffic Act and Regulations (1998:1276), all bicycles must have a lamp showing white or yellow light at the front and showing a red light at the back of the vehicles during darkness. Therefore, this observation is to see if cyclists have applied the regulations properly or not. In this observation, all types of front lights, including small lights that have a function as a marker, were taken into account.

The yellow retro-reflectors shall be mounted on the spokes of the wheels (Swedish Road Traffic Act and Regulations, 1998: 1276). Therefore, the study concerning reflectors was divided into two observations, first, the missing front and rear reflectors, and the second, the missing front and rear-wheels reflectors.

Helmet use was also studied as an additional observation to get a picture concerning the connection between the use of the helmet and the obedience of the use of lights and reflectors.

The study also observed cyclists direction to see whether cyclists' trip direction influenced the use of lights and reflectors.

### 2.4.3. Interview with Cyclists

The interview method is carried out to test the hypotheses of this research especially the second hypothesis: "*Cyclists do not use lights because they do not know about regulations related with the cyclists' obligation to use the lights during darkness"*.

Because of being aimed to cyclists then it should be not so many questions that will be asked and the questions shall be easy to be understood. In the process of interview protocol making it was realised that the number of questions were too many for cyclists and one question was difficult to be understood. After changing the layout mainly the questions, the protocol was tested again and this time the result was accepted. The final layout can be seen in Appendix 37.

The interviews was carried out in 4 – 8 May 2009 and took place in five different locations, the locations that are the same as for behaviour observations. After carrying out the observation of behaviour the interviews were made at the same location.

#### 2.4.3.1. Respondents

For the evaluation, twenty interviews are carried out for each location so that a hundred interview data are obtained from all five locations. The interviews are conducted randomly which means that all cyclists that passed the observation locations are stopped. Conducted randomly also means that this research does not specialized in certain respondents' criteria mainly the age and the work e.g. students or workers.

All questions are standardized. Every cyclist is asked the same questions in the same way. All respondents must be in circumstances not drunk in this interview process so that the results can be relied on. With consideration that in the weekends more people are drunk, the interviews are conducted during weekdays and are not carried out in the weekends.

#### 2.4.3.2. Questions

During this field interviews four questions are asked – one open question and three closed questions (questions with given answer alternatives). Additional information concerning age, weather and also own observations on the condition of respondents' bicycle have been noted by the interviewer. An interview took between two and five minutes. In table 2.3. below standardized questions and answer alternatives are presented.

The first question: "Usually, do you use lights when you bicycle in darkness?" is asked to know the cyclists' customs in cycling in darkness. Four answer alternatives are possible: always, sometimes, never and it depends. The answer "it depends" was given to anticipate the respondents' behaviour in using lights if only have the lights with them when travelling.

The second question: "What is the function of the lights on the bicycles?" is aimed to get cyclists' understanding about the function of bicycle light in accordance with Swedish Road Traffic Act and Regulations. Four answer alternatives are given: to see the way in darkness, to be seen in the dark, no idea and other.

The third questions is: "What do you think about the price of bicycles' price?". This third question had a purpose to know whether economical reason was one of the factors that influence the respondents in the use of bicycle light. This question has three answer alternatives: affordable, quite expensive, and too expensive.

The fourth question "Do you know the rules about lights and reflectors on the bicycles?" is asked to know the respondents' knowledge and their interpretation regarding bicycle regulations. Two answers are given for this question: "Yes, I know it" and "No, I do the not know". Respondents are asked to describe the rules if they know about the regulations.

Table 2.4. Short description of the interviews

| Interview questions | Interview answer alternatives |
|---|---|
| Usually, do you use lights when you bicycle in darkness? | Always, sometimes and never |
| What is the function of the lights on the bicycles? | To see the way in darkness, to be seen in the dark, no idea and other |
| What do you think about the price of bicycles' price? | Affordable, quite expensive, and too expensive |
| Do you know the rules about lights and reflectors on the bicycles? | Free text if cyclists know the regulations |

# III. RESULTS

## 3.1. Literature Studies Results

### 3.1.1. Bicycle in general

Based on European Cyclists Federation (2004), in 2003 the bicycle is used for more than 100 million journeys each day in Europe and each year 100 billion kilometres (100,000,000,000) are cycled. Thus, around 300 million bicycles – more than the number of cars – are to be found in Europe. On average, each citizen in Europe makes 50 cycle journeys and cycles 125 km per year (ECF, 2004).

Furthermore, cycling has several advantages compared to other means of transport. The bicycle is probably the most sustainable transport means ever invented. Cycling moreover has a significant potential to replace car use in cities, where many car trips are short. It is suitable for many local journeys and can be used in combination with public transport for longer trips, such as train.

Cycling is totally free of emissions and is not causing any damage to the urban atmosphere. Another aspect is noise; bikes are practically noiseless compared to motorized vehicles, in this way cities become more sound friendly (Santmiquel, 2004)

Cycling is also recognised as being healthy for the user, the main health benefits of cycling come from its contribution to overall levels of physical activity. Physical activity is the broad term used to describe 'any force exerted by skeletal muscle that results in energy expenditure above resting level. Thus physical activity includes any form of human movement including walking, cycling, play, active hobbies (Cavill and Davis, 2007).

Cycling is also cost effective. The bicycle itself is cheap and the maintenance costs are also reasonable.

The bicycle has low space requirements during trips and for parking. Because of this, bicycle has been considered as a quick means of transport in urban areas. The low space requirements for parking makes a short distance possible between parking and origin or destination, contributing to a low overall time consumption (ECF, 1993).

However besides having the advantages of cycling, cyclists are also often described as "soft", or "vulnerable" road users. The term "unprotected road users" gives a better description of the fact that cyclists are subject to severe injuries in crashes. Care should also be taken when improving cyclists' safety. Cyclists require not only infrastructure –roads and cycle tracks- that are safe, convenient and pleasant to use but also regulations that guaranteed the safety and secure feeling and the comfort ness of cycling.

### 3.1.2. Bicycle regulations in Sweden

#### 3.1.2.1. Cyclists' obligation to use lights and reflectors

According to Swedish Road and Traffic Act and Regulations (1998:1276) a bicycle is classified as a VEHICLE and being under the competence of Swedish Road Traffic Act and Regulations, Section 3, General Rules for vehicles used in road traffic.

In relations with this research, all bicycle regulations, which are related with the obligation of lights and reflectors, was arranged in Swedish Road and Traffic Act and Regulations SFS 1998:1276 (Trafikförordning (1998:1276)), Chapter 3 Requirements for vehicles (3 kap. Bestämmelser för trafik med fordon), Articles about Illumination (Belysning), Lighting when having journey on the roads (Belysning vid färd på väg), Lighting when having journey on the fields (Belysning vid färd i terräng), section 67 § - 77 §.

Bicycles without lights and reflectors are invisible in the dark. Therefore a bicycles must have bike lights powered by either generator or battery.

There have been detailed requirements for cyclists when having trips during darkness according to Swedish Road Administration's Regulations concerning bicycles, horse-drawn vehicles and kick backed investments (VVFS 2008:163, 14 § - 15 §.). Those requirements for cyclists are: forwards; A fixed light showing white or yellow colour and clearly can be seen at a distance of 300 metres. The lamp must have such a brightness that the vehicle at night can be kept at a safe manner. A bicycle must have rear lamp which can displays red light colour and clearly can be seen at a distance of 300 metres. A bicycle must also have retroreflectors showing red light for tail light and white for front reflectors.

According to Peterson (2009b), in city traffic where there is acceptable street lighting, the intensity of the light must be that other road users could see the on-coming cyclist in a reasonable distance. On a road in darkness where there is no streetlights, the intensity of the front head light must of such brightness so the cyclist him/herself can see the road surface forwards at a reasonable distance in order to drive safely and of course that other road users can see the oncoming cyclist in a reasonable safe distance.

Moreover according to Peterson (2009b) based on the interpretation of the regulation, the rear light must be fixed red light and of such a brightness that oncoming traffic from behind can observe the cyclist in a reasonable safe distance (300 - 350 meters). The rear red light lamp can be combined with the red retro-reflector while the white retro-reflector in front of the bicycle cannot be combined with the headlamp.

Furthermore, the yellow/amber side reflectors are recommended to be mounted on the spokes of the wheels. This gives a very good retro reflection when a cyclist is crossing a road. The on-coming driver of vehicles will observe the crossing bicycle on a very long distance (Peterson, 2009b).

Figure 3.1. Bicycle with complete equipments as regulated in Swedish Road Traffic Act and Regulations (Source: Vagverket, 2009)

#### 3.1.2.2. Penalty

The regulation related with the cyclists regulations violations can be found on The Swedish Prosecutors Provisions SFS 1999:178 (Riksåklagarens föreskrifter om ordnings bot för vissa brott SFS 1999:178).

According to this regulation, the penalty for this violation is fine, which means cyclists who are not using lights and reflectors during darkness are forced to pay some amount of money. The fine, according to SFS 1999:178 is 300 Swedish kronor per missing light. So, based on the regulation, if a cyclists is missing front light only then he/she will have to pay 300 Swedish kronor fine, and if the cyclists are missing both front and rear light then the fine would be 600 Swedish kronor.

### 3.1.3. Bicycle in Lund

The City of Lund situated in the southern Sweden. Lund is the twelfth largest municipality in Sweden with 106.000 inhabitants. It is located about 20 kilometres away from Malmö, the capital of Skåne which is the third largest municipality in Sweden and also known as one of the most economic important area in the country, about almost 23.000 people commute to Lund and about 14.000 people commute from Lund (Lunds Kommun, 2009b).

Researches done in the university have been applied in city development, including developing better and more 'user friendly' bicycle paths in and around the city. Since 1998, the City of Lund has invested close to 80 million Swedish kronor to improve conditions for cyclists: more bike paths, higher standards for bike paths, better lighting, safer crossings, improved parking facilities, and a variety of different activities to promote cycling. These investments, collectively known as Cykelkommunen (the Bike Municipality), are part of the LundaMaTs project to create an environmentally sound transportation system. The aim is to reduce the environmental impact of motor traffic by replacing car travel with cycling (Lunds Kommun, 2009b).

LundaMaTs consists of 33 measures in order to reduce CO2 emission and to get as many people as possible to cycle rather than drive. This project focuses on hard measures in order to improve bicycle infrastructures and soft measures in campaigns to change people's attitude and transport behaviour in favour of cycling (LundaMaTs System, 2009).

Another effort that has been done by the Municipality of Lund is WALCYNG. Like its name, WALCYNG (WALking and CYcliNG) promotes walking and cycling as an alternative to replace short car trips. WALCYNG focuses on the needs of vulnerable road users (pedestrians and cyclists) (Lund University, 2009)

WALCYNG, a European Project, has 13 different work packages (WP). Each of the work packages will give important knowledge of the different parts of WALCYNG, like description of the conditions for walking and cycling in different countries, the main problems for pedestrians and cyclists, identification of measures and incentives to improve the conditions for walking and cycling, communication strategies and campaigns for implementing measures, information about the main advantages and the obstacles connected to walking and cycling. WALCYNG also includes an assessment of safety problems of pedestrians and cyclists and an identification of relevant solutions (Hyden, Nilsson, Risser, 1999)

The good topography conditions, the good weather compared to other parts of Sweden, and the concentration of the university building help people to choose bike as a transport mode. Because of these reasons, route choice criteria must be taken into account when making facilities for cyclists. Cyclists will usually choose the quickest route for most journeys. Cyclists also will avoid routes that are hilly, perceived as dangerous or have bad riding surfaces (The Institute of Highways and Transportation, 1997).

Nowadays, Lund is already one of the municipalities in Sweden with a very high number of cyclists. About half of all the journeys in the densely built up areas are by cycle or on foot (LundaMaTs System, 2009).

The city centre is bounded by the Södra Esplanaden in the south, Östra Vallgatan in the east, St Laurentiigatan in the north and Bangatan in the west. In 2008, 42,200 cyclists cross the city border each day, compared with 45,800 bikers in 1992 (Lunds Kommun, 2009a).

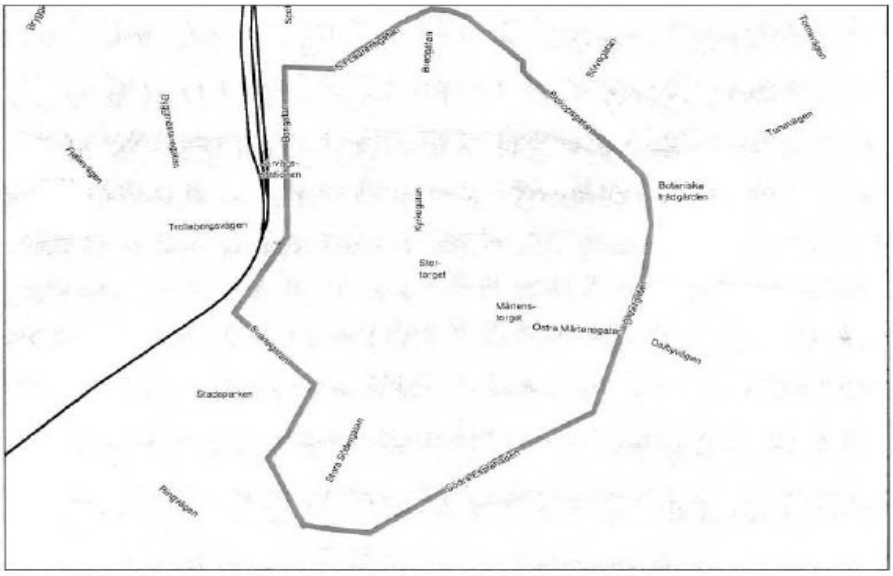



Figure 3.2. Lund City Center
(Source: Lunds Kommun, 2009a)

Compared with 2007, the number of cyclists in certain locations in Lund increased by 8%. Cycling number varies up and down each years, which may be due to temporary factors that possibly affects it. On average, almost 30% of Lund cyclists have work purposes, 20% going to or from school, 12% have purchase purposes and other reason (Lunds Kommun, 2009a)

In 2008 over 11% of cyclists use helmets when bicycle on streets in Lund, which is an increase of more than seven times compared with 1993 when only 1.5% used a helmet. Despite the trend, it is a relatively low proportion of cyclists who use helmets compared to several other locations in Sweden

### 3.1.4. Interviews

Kvale (1996) defines the research interview as an interview whose purpose is to obtain descriptions of the life world of the interviewee with respect to interpreting the meaning of the described phenomena. It is a conversation that has a structure and a purpose. It goes beyond the spontaneous exchange of views in everyday conversation, and becomes a careful questioning and listening approach with the purpose of obtaining thoroughly tested knowledge.

Moreover, according to Kvale and Brinkmann (2009), the research interview is not a conversation between equal partners, because the researcher defines and controls the situation. The interview researcher introduces the topic of the interview and also critically follows up on the subject's answer to researcher's question.

There are no standard techniques or rules exist for an interview investigation. However, in order to provide some structures to an open and flexible interview study, Kvale (1996) emphasizes seven stages for an interview inquiry.

Seven stages of an interview investigation are (Kvale, 1996):

1. Thematizing.
   Formulate the purpose of an investigation and describe the concept of the topic to be investigated before the interview starts. The why and what of the investigation should be clarifiedbefore the question of how is posed.

2. Designing.
   Plan the design of the study, taking into consideration all seven stages of the investigation, before the interviewing starts. Designing the study is undertaken with regard to obtaining the intended knowledge and taking into account the moral implications of the study. When planning the design of the study, the basic idea that the interviewer's questions should be brief and simple is taken into account.

3. Interviewing.
   Conduct the interviews based on an interview guide and with a reflective approach to the knowledge sought and the interpersonal relation of the interview situation.

4. Transcribing.
   Prepare the interview material for analysis, which generally includes a transcription from oral speech to written text.

5. Analyzing.
   On the basis of the purpose and topic of the investigation and also of the interview material, decide which mode of analysis are appropriate for the interviews.

6. Verifying.
   Ascertain the generalizability, reliability and validity of the findings.

7. Reporting.
   Communicate the findings of the study in a form that eligible scientific criteria and results in a readable product.

## 3.2. Field Observation Results

In this following chapter, the results of bicycle volume counts, behaviour studies, and interviews are presented and described in detail.

### 3.2.1. Results from Behaviour Studies

The purpose of this behaviour studies is to observe whether cyclists use lights or not during darkness time. This behaviour observations were conducted from 23 April 2009 until 29 April 2009 in five different locations based on the counts results (see table 2.3.). For each location, 15-minute periods of observation are carried out for two hours. The results for these observations can be seen in table 3.1. – 3.5. below.

#### *3.2.1.1 Bredgatan-Allhelgonakyrkan*

Table 3.1. Observation Result - Bredgatan-Allhelgonakyrkan

| Time Period | TOTAL Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | Both | Front | Rear | Both | SIDE (WHEEL) | | | All | M | F | | ↓ | ↑ |
| | | | | | | | | Front | Rear | Both | | | | | | |
| 1 | 22 | 2 | 4 | 8 | 3 | 0 | 1 | 5 | 4 | 1 | 0 | 12 | 10 | 0 | 10 | 12 |
| 2 | 19 | 4 | 3 | 7 | 3 | 0 | 1 | 9 | 2 | 2 | 0 | 7 | 12 | 2 | 9 | 10 |
| 3 | 24 | 3 | 4 | 6 | 0 | 1 | 0 | 6 | 4 | 3 | 2 | 10 | 14 | 1 | 12 | 12 |
| 4 | 23 | 2 | 8 | 7 | 8 | 1 | 1 | 5 | 2 | 3 | 0 | 12 | 11 | 2 | 8 | 15 |
| 5 | 21 | 1 | 4 | 9 | 3 | 2 | 0 | 6 | 0 | 9 | 0 | 13 | 8 | 0 | 9 | 12 |
| 6 | 12 | 1 | 1 | 6 | 0 | 0 | 0 | 3 | 1 | 5 | 0 | 6 | 6 | 0 | 3 | 9 |
| 7 | 24 | 2 | 4 | 7 | 2 | 2 | 0 | 2 | 4 | 6 | 2 | 13 | 11 | 3 | 5 | 19 |
| 8 | 24 | 4 | 4 | 7 | 3 | 0 | 1 | 3 | 4 | 5 | 0 | 12 | 12 | 0 | 5 | 19 |
| **TOTAL** | **169** | **19** | **32** | **57** | **22** | **6** | **4** | **39** | **21** | **34** | **4** | **85** | **84** | **8** | **61** | **108** |
| **%** | **100** | **11** | **19** | **34** | **13** | **4** | **2** | **23** | **12** | **20** | **2** | **50** | **50** | **5** | **36** | **64** |

Legend: ↓ Downtown
↑ Sjukhuset

During 15-minute periods for two hours of observation in Bredgatan-Allhelgonakyrkan, 169 cyclists were passing through the sites. From that number, 85 cyclists are male and the rests are female. It means that the number of cyclists are equally divided in relation with gender. Around thirty-four percent (34%) or about 57 cyclists were not using bicycle lights both front and rear light. And only about 2% or 4 cyclists who did not use the reflectors both front and rear, as it is regulated in the Swedish Road Traffic Act and Regulation.

During two-hour observation, about 108 cyclists were heading sjukhuset (hospital) from Centrum direction. As described in chapter 2.2.2.3. there are areas in dwelling Norra Falladen and also student dwellings in northern area of Lund (Delphi). At this time of observation, it could be assumed that cyclists are going home.

About 57 cyclists or around 53 % male cyclists dominate cyclists who were missing lights in relation with gender, and there are also 51 female cyclists or around 47%. Missing lights bicycle here means that all cyclists who did not use either front, rear or both lights are all taken into account.

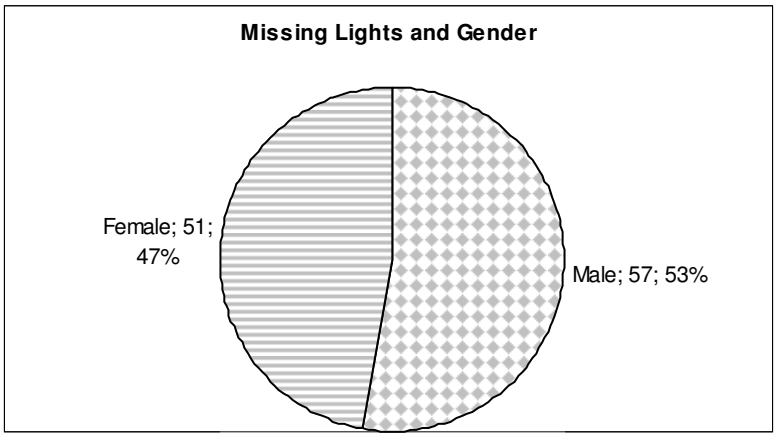



Figure 3.3. Missing Lights in relation with Gender
in Bredgatan-Allhelgonakyrkan

In figure 3.4. it can be seen that, in this location, cyclists who did not use proper reflectors as regulated are mostly male cyclists.

Total missing fixed reflectors are total number of bicycles who did not use either front, rear or both front and rear fixed reflectors. Based on the observation, 22 male cyclists and 10 female cyclists did not use these fixed reflectors.

Total missing side reflectors are total number of cyclists who did not use front-side, rear-side or both front and rear-side reflectors. Side reflectors are yellow reflectors which are mounted on the spokes of the wheels. During the observation, 68 male cyclists and 58 female cyclists are missing their side reflectors.

There are 3 male cyclists and 1 female cyclists who were missing all reflectors, both fixed and side-reflectors (see figure 3.4.).

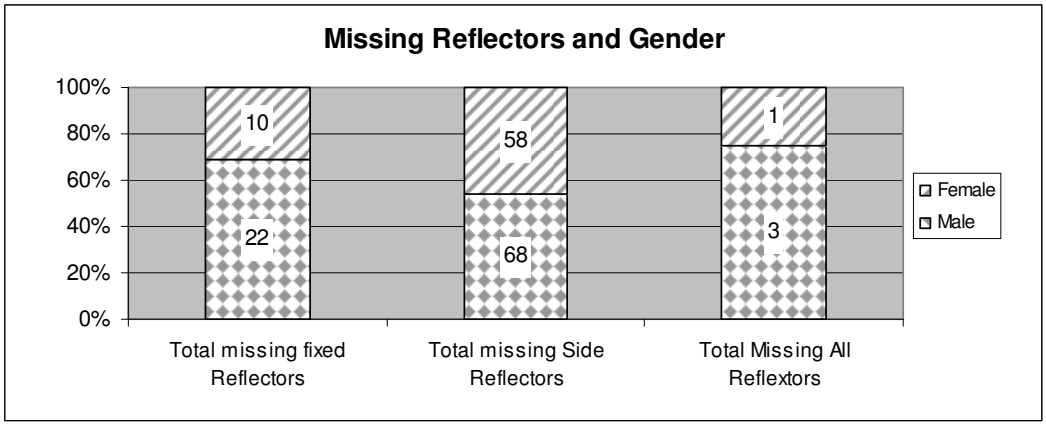



Figure 3.4. Missing Reflectors in relation with Gender
in Bredgatan-Allhelgonakyrkan

From 169 cyclists passed through this location during the observation periods, as many as 38 cyclists, or about 35% of cyclists who did not use bicycle lights, either missing front light, rear light or both lights, were heading the downtown and as many as 70 cyclists, or approximately 65% cyclists were heading sjukhuset direction (see figure 3.5.)

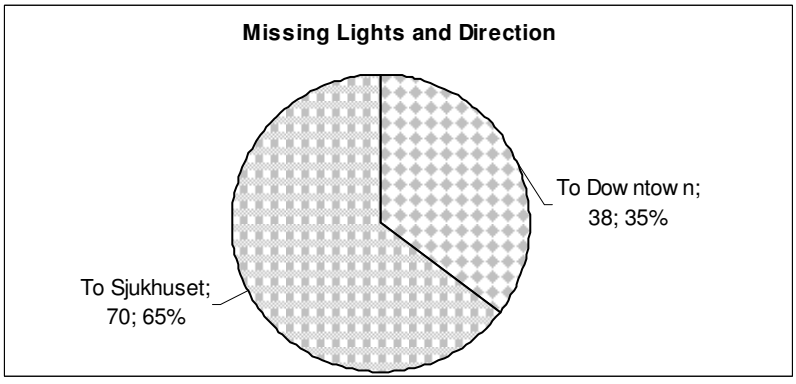



Figure 3.5. Missing Lights in relation with Direction
in Bredgatan-Allhelgonakyrkan

In figure 3.5. it can be seen that, in this location, cyclists who did not use proper reflectors as regulated are also mostly heading to sjukhuset direction.

Total missing fixed reflectors are total number of bicycles who did not use either front, rear or both front and rear fixed reflectors. Based on the observation, 19 female cyclists did not use these fixed reflectors when cycled to sjukhuset direction

Total missing side reflectors are total number of cyclists who did not use front-side, rear-side or both front and rear-side reflectors. Side reflectors are yellow reflectors which are mounted on the spokes of the wheels. During the observation, 57 cyclists are missing their side reflectors during their journey towards sjukhuset direction.

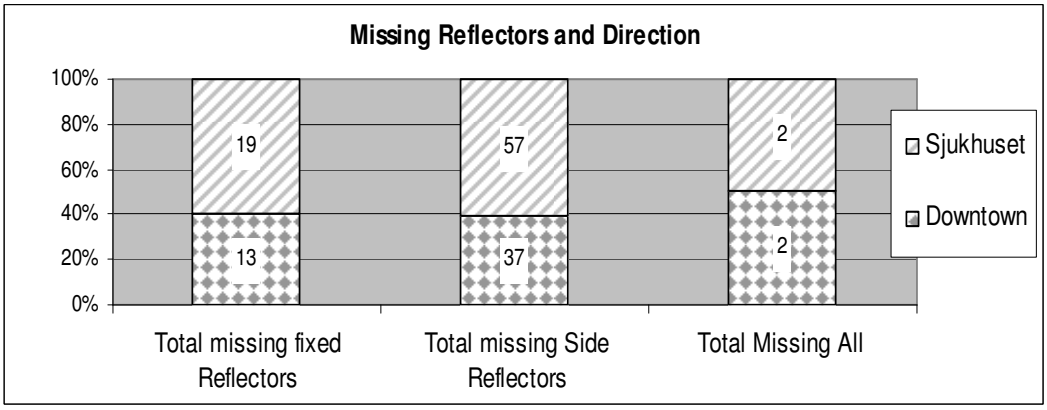



Figure 3.6. Missing Reflectors in relation with Direction in Bredgatan-Allhelgonakyrkan

In relation between helmets use and the use of lights oh the bicycles, figure 3.7. shows that more than 50% cyclists who wore helmets also have complete lights on their bicycles.

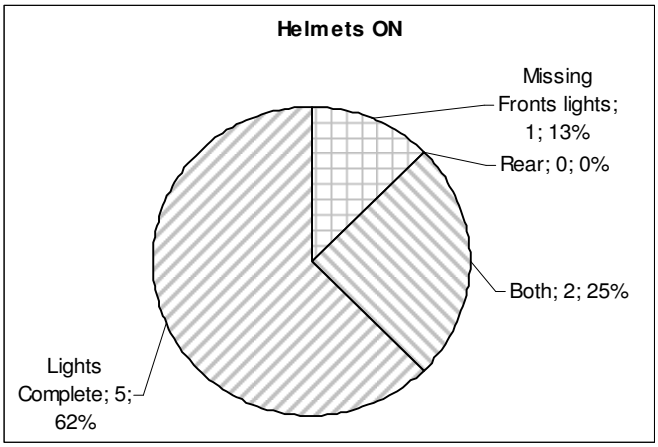



Figure 3.7. Helmets use in relation with Bicycle Lights use in Bredgatan-Allhelgonakyrkan

### *3.2.1.2 Stora Södergatan-Södra Esplanaden*

Table 3.2. below shows the results from the observation which took place in Stora Södergatan-Södra Esplanaden.

Table 3.2. Observation Result - Stora Södergatan-Södra Esplanaden

| Time Period | Total Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | Both | Front | Rear | Both | SIDE (WHEEL) | | | All | M | F | | ↓ | ↑ |
| | | | | | | | | Front | Rear | Both | | | | | | |
| 1 | 27 | 4 | 11 | 8 | 3 | 1 | 2 | 8 | 5 | 5 | 0 | 14 | 13 | 1 | 12 | 15 |
| 2 | 17 | 0 | 1 | 9 | 4 | 0 | 0 | 3 | 2 | 3 | 0 | 12 | 5 | 0 | 15 | 2 |
| 3 | 18 | 1 | 5 | 6 | 2 | 0 | 0 | 5 | 2 | 3 | 0 | 11 | 7 | 1 | 15 | 3 |
| 4 | 15 | 1 | 3 | 6 | 3 | 0 | 0 | 6 | 0 | 3 | 0 | 8 | 7 | 2 | 7 | 8 |
| 5 | 10 | 0 | 0 | 7 | 3 | 0 | 0 | 4 | 1 | 2 | 0 | 9 | 1 | 1 | 7 | 3 |
| 6 | 10 | 1 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 5 | 0 | 5 | 5 | 0 | 5 | 5 |
| 7 | 12 | 1 | 3 | 3 | 0 | 0 | 0 | 4 | 1 | 2 | 0 | 7 | 5 | 1 | 7 | 5 |
| 8 | 12 | 0 | 3 | 5 | 0 | 0 | 0 | 2 | 0 | 5 | 0 | 7 | 5 | 1 | 7 | 5 |
| **Total** | **121** | **8** | **26** | **51** | **15** | **1** | **2** | **35** | **11** | **28** | **0** | **73** | **48** | **7** | **75** | **46** |
| **%** | **100** | **7** | **21** | **42** | **12** | **1** | **2** | **29** | **9** | **23** | **0** | **61** | **39** | **6** | **62** | **38** |

Legend: ↓ Esplanaden
↑ Downtown

In two-hours observation, 121 cyclists were passing through this location which is sixty-one percent of them are male. About 75 cyclists, which is 62 percent, were heading Södra Esplanaden from downtown direction.

From 122 cyclists, 40 cyclists did not use both front and rear light on their bicycle. The number of cyclists who did not use front reflector are bigger than those who did not use both front and rear reflectors. Two cyclists were missing both front and rear reflectors while 15 cyclists were missing only front reflectors.

For side reflector, which were mounted on the spokes of the wheels, also have the same situation. Thirty percent of the cyclists or about 37 cyclists were missing front-side reflectors. It is bigger than the number of cyclists who were missing both front and rear reflectors which is 25 cyclists.

Like in Bredgatan-Allhelgonakyrkan, in this location male cyclists also have the biggest number of cyclists with missing lights. Around 62% or 53 male cyclists and 32 female cyclists or 38% did not use bicycle lights (see figure 3.8.).

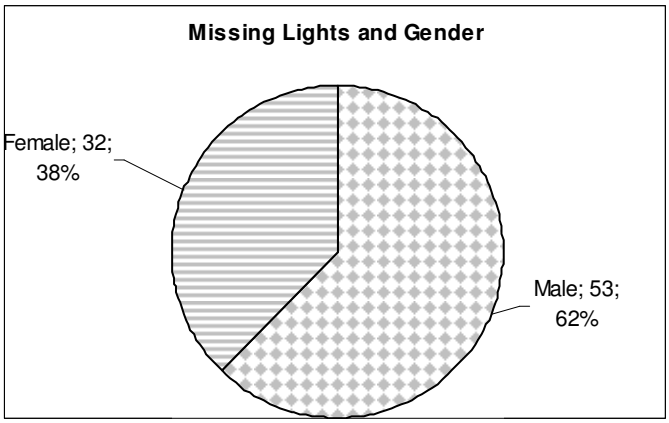



Figure 3.8. Missing Lights in relation with Gender
in Stora Södergatan-Södra Esplanaden

Here, in this location more than 50% of cyclists with missing reflectors are mostly male cyclists. During two-hour observation, there are no cyclists who missed all their reflectors. It means every cyclist who passed through this locations at least have one reflectors on their bicycles.

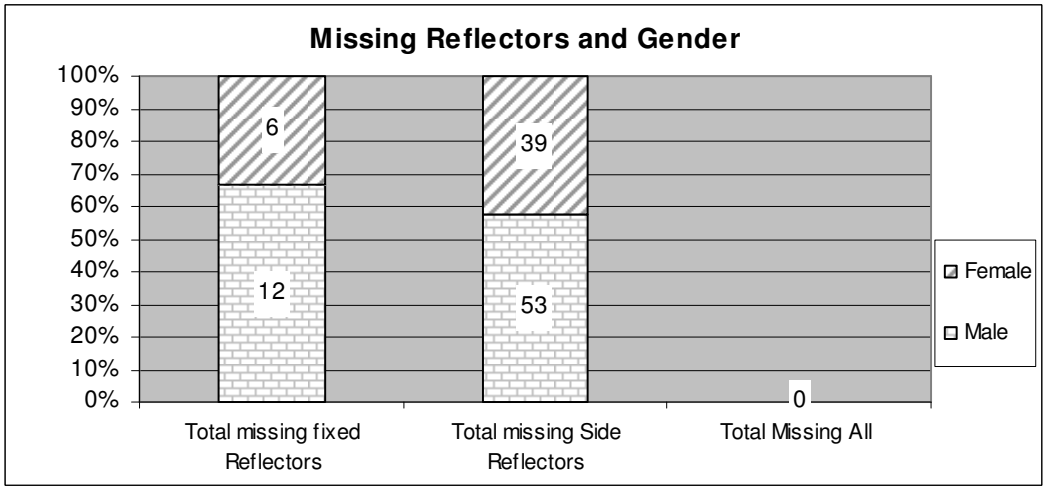



Figure 3.9. Missing Reflectors in relation with Gender
in Stora Södergatan-Södra Esplanaden

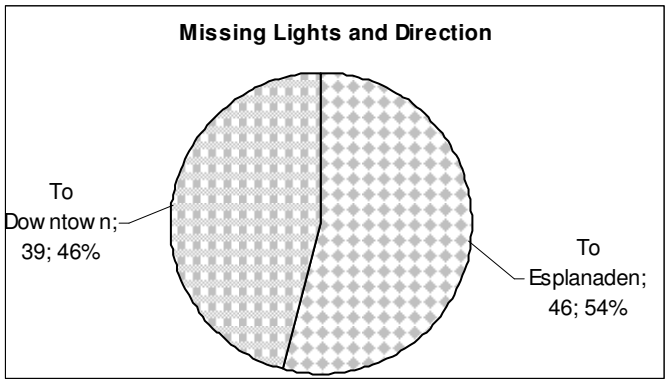



Figure 3.10. Missing Lights in relation with Direction
in Stora Södergatan-Södra Esplanaden

In this location where students live nearby, 54% of cyclists or about 46 cyclists were going to Södra Esplanaden direction and 46% of cyclists (39 cyclists) were heading downtown

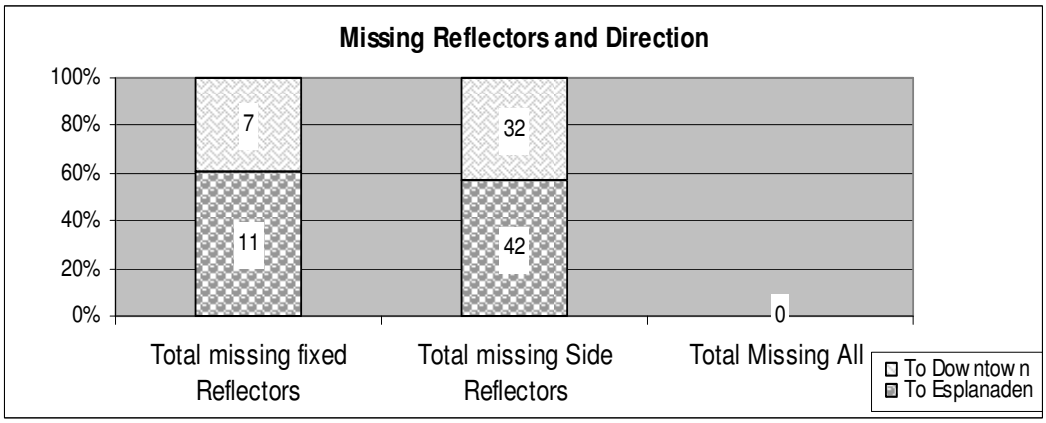



Figure 3.11. Missing Reflectors in relation with Direction
in Stora Södergatan-Södra Esplanaden

Figure 3.11. shows that almost 60% of cyclists with missing either fixed reflectors or side-reflectors were heading Södra Esplanaden direction. There are 11 out of 18 cyclists with missing fixed reflectors were going to Esplanaden direction. Forty-two out of 74 cyclists with missing side reflectors were also heading Esplanaden.

During the observation, there are 4 cyclists or around 66% who were wearing helmets and also have complete lights on their bicycles (see figure 3.12)

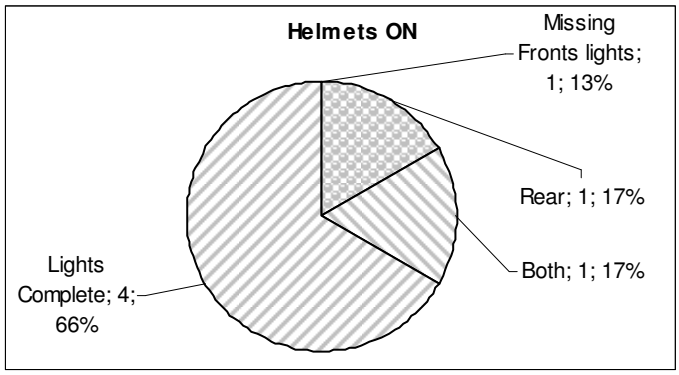



Figure 3.12. Helmets use in relation with Bicycle Lights use in Bredgatan-Allhelgonakyrkan

### *3.2.1.3 Tunavägen - Sångarevägen*

Results in the observation Tunavägen - Sångarevägen shows that there is not too much different between men and women, around 54 % are male and the rests are female. The direction of spelmanvägen / linero became the direction that has many cyclists compared to SPARTA direction.

In this location, total 57 cyclists or around 59 % did not use both front and rear lights. It means that this location has the highest number of cyclists who were missing both lights compared to other locations.

Comparing about side reflector, it is not too different for each category, 22 cyclists did not use front-side reflector, 21 cyclists did not use rear-side reflector and 31 cyclists did not used both of them (see table 3.4.).

During two-hour observation, 96 cyclists passed through this location, 58 of them were heading Linero / Spelmansvägen direction and the rests are heading Sparta direction.

Table 3.3. Observation Result - Tunavägen-Sångarevägen

| Time Period | TOTAL Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | Both | Front | Rear | Both | SIDE | | | All | M | F | | ↓ | ↑ |
| | | | | | | | | Front Wheel | Rear Wheel | Both Wheel | | | | | | |
| 1 | 22 | 0 | 1 | 19 | 0 | 0 | 0 | 5 | 7 | 7 | 0 | 15 | 7 | 0 | 8 | 14 |
| 2 | 26 | 1 | 1 | 19 | 0 | 0 | 0 | 5 | 1 | 14 | 0 | 13 | 13 | 1 | 18 | 8 |
| 3 | 11 | 1 | 0 | 5 | 0 | 0 | 0 | 2 | 2 | 3 | 0 | 4 | 7 | 0 | 3 | 8 |
| 4 | 9 | 0 | 1 | 5 | 0 | 0 | 0 | 2 | 3 | 2 | 0 | 4 | 5 | 1 | 1 | 8 |
| 5 | 9 | 1 | 1 | 4 | 0 | 1 | 0 | 2 | 1 | 3 | 0 | 4 | 5 | 1 | 4 | 5 |
| 6 | 7 | 1 | 3 | 1 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 4 | 3 | 0 | 2 | 5 |
| 7 | 8 | 1 | 2 | 2 | 1 | 0 | 0 | 2 | 3 | 1 | 0 | 5 | 3 | 0 | 1 | 7 |
| 8 | 4 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 1 | 0 | 1 | 3 |
| **Total** | **96** | **5** | **10** | **57** | **1** | **1** | **0** | **22** | **21** | **31** | **0** | **52** | **44** | **3** | **38** | **58** |
| **%** | **100** | **5** | **10** | **59** | **1** | **1** | **0** | **23** | **22** | **32** | **0** | **54** | **46** | **3** | **40** | **60** |

Legend: ↓ SPARTA
↑ Linero

In this location, 72 cyclists did not use bicycle lights, 40 of them are male cyclists and the rests are female. It means that male cyclists have the biggest number, 56% of total cyclists

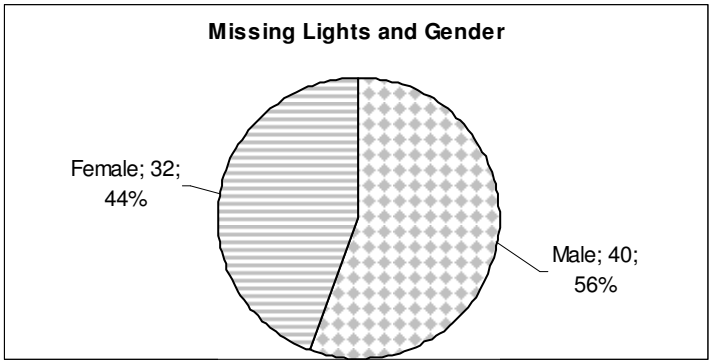



Figure 3.13. Missing Lights in relation with Gender in Tunavägen-Sångarevägen

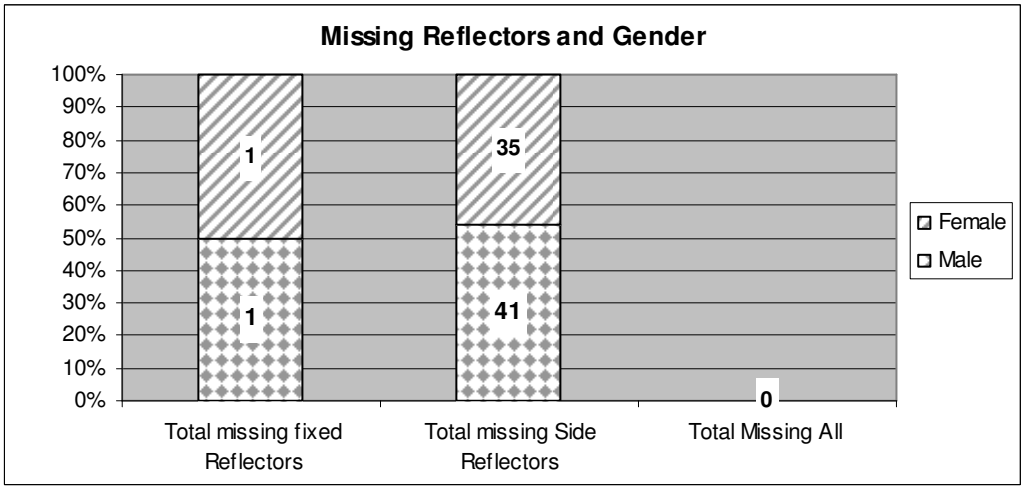



Figure 3.14. Missing Reflectors in relation with Gender in Tunavägen-Sångarevägen

There are not so many differences in total number of cyclists between male and female cyclists with missing reflectors. Forty-one male cyclists were not using side reflectors compared to 35 female cyclists. It means male cyclists are 54% and 46% are female cyclists.

For cyclists who missed fixed reflectors, apparently the number of cyclists is equally divided between male and female cyclists. There are only 1 male cyclists and 1 female cyclists who were missing fixed reflectors (see figure 3.14).

Figure 3.15 and 3.16 show us that both missing light and missing reflectors cyclists are mostly heading towards Linero direction. Forty-two cyclists or about 58% of total cyclists who missed bicycle lights were heading towards Linero direction. Forty-five out of 76 cyclists with missing side reflectors were also heading Linero.

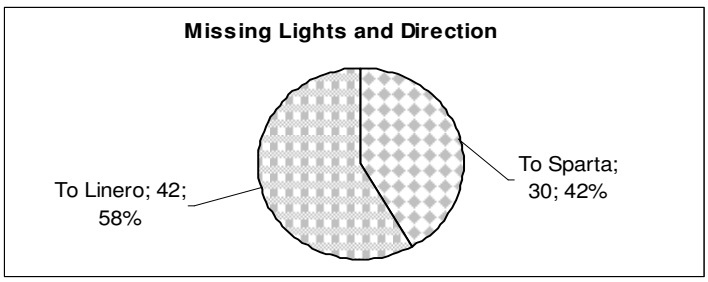



Figure 3.15. Missing Lights in relation with Direction in Tunavägen-Sångarevägen

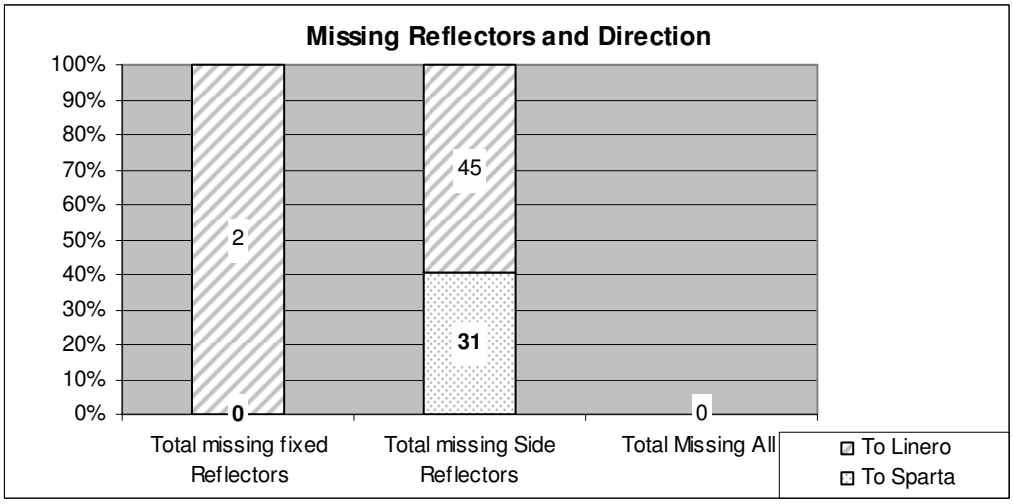



Figure 3.16. Missing Reflectors in relation with Direction in Tunavägen-Sångarevägen

A hundred percent of cyclists, about 2 cyclists who missed fixed reflectors, were going to Linero direction. Furthermore, during the observation periods, all cyclists passed through the location have at least one reflector on their bicycle. It means that there is no cyclists with missing all reflectors (see figure 3.16).

All cyclists who use helmets during the observation in this location also have complete lights.

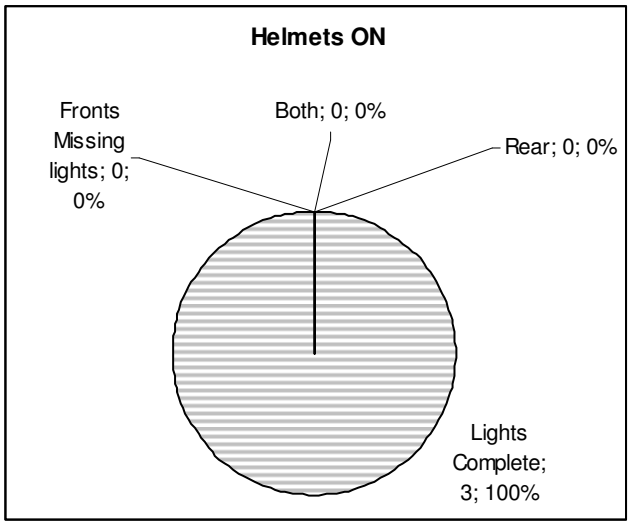



Figure 3.17. Helmets use in relation with bicycle lights use in Tunavägen-Sångarevägen

### *3.2.1.4 Trollebergsvägen (Bantorget)*

From 252 cyclists that went through this location, totalling 76 cyclists did not use front light, 53 cyclists did not use the rear-light and 75 cyclists did not use both lights (see table 3.4.).

Table 3.4. Observation Result - Trollebergsvägen (Bantorget)

| Time Period | Total Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | Both | Front | Rear | Both | SIDE (Wheel) | | | All | M | F | | ↓ | ↑ |
| | | | | | | | | Front | Rear | Both | | | | | | |
| 1 | 41 | 11 | 9 | 15 | 3 | 3 | 2 | 9 | 9 | 10 | 3 | 16 | 25 | 1 | 25 | 16 |
| 2 | 41 | 14 | 10 | 9 | 6 | 2 | 0 | 10 | 13 | 10 | 2 | 18 | 23 | 1 | 22 | 19 |
| 3 | 38 | 18 | 11 | 6 | 6 | 0 | 0 | 8 | 14 | 5 | 1 | 21 | 17 | 0 | 20 | 18 |
| 4 | 30 | 8 | 2 | 9 | 5 | 0 | 0 | 11 | 6 | 10 | 0 | 14 | 16 | 0 | 15 | 15 |
| 5 | 29 | 8 | 5 | 11 | 2 | 4 | 0 | 9 | 5 | 8 | 0 | 18 | 11 | 0 | 13 | 16 |
| 6 | 29 | 7 | 8 | 9 | 2 | 0 | 0 | 10 | 10 | 6 | 0 | 15 | 14 | 0 | 11 | 18 |
| 7 | 26 | 7 | 6 | 10 | 1 | 2 | 0 | 5 | 6 | 6 | 2 | 11 | 15 | 0 | 12 | 14 |
| 8 | 18 | 3 | 2 | 6 | 2 | 1 | 0 | 6 | 4 | 5 | 0 | 8 | 10 | 0 | 7 | 11 |
| **Total** | **252** | **76** | **53** | **75** | **27** | **12** | **2** | **68** | **67** | **60** | **8** | **121** | **131** | **2** | **125** | **127** |
| **%** | **100** | **30** | **21** | **30** | **11** | **5** | **1** | **27** | **27** | **24** | **3** | **48** | **52** | **1** | **50** | **50** |

Legend: ↓ Trollebergsvägen
↑ Bantorget

In relation to the aim direction, those numbers of cyclists are equally divided, which are 125 cyclists were going from Bantorget and 127 cyclists from Bantorget. From 252 the total cyclists, about 131 cyclists or about 52 % are female and 121 cyclists are Male.

It is not so many differences in the use side-reflector by cyclists. Totalling 68 cyclists did not use front-side reflector, 67 cyclists did not use rear-side reflector and 60 cyclists for both reflectors.

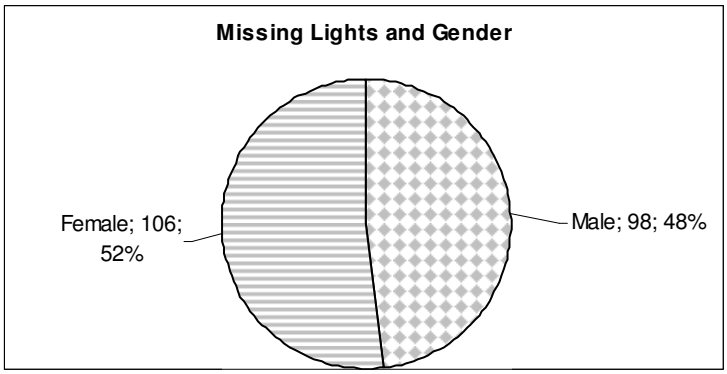



Figure 3.18. Missing Lights in relation with Gender
in Trollebergsvägen (Bantorget)

In figure 3.18 we can see that 52% of cyclists with missing lights or about 106 cyclists are female cyclists, and 98 cyclists out of 204 total cyclists or around 48% are male cyclists.

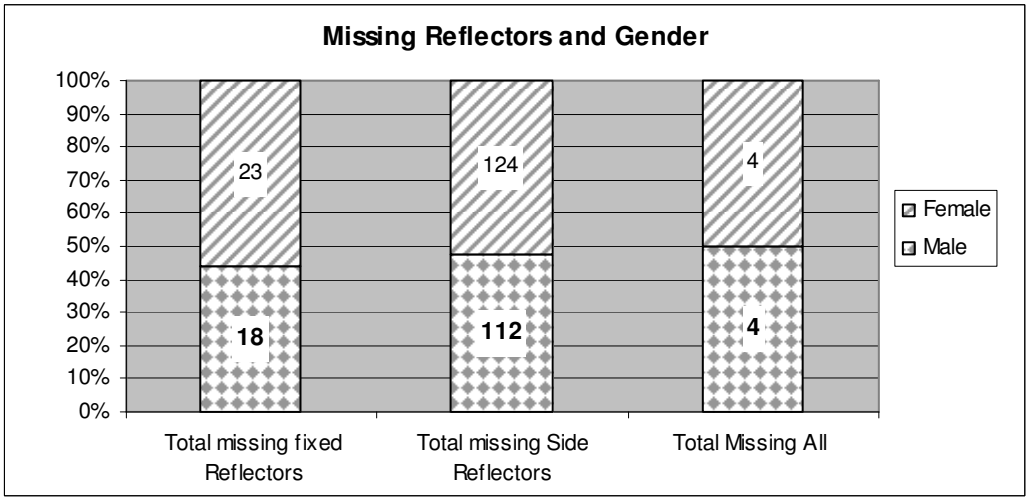



Figure 3.19. Missing Reflectors in relation with Gender
in Trollebergsvägen (Bantorget)

From figure 3.20 there is not much differences between cyclists with missing reflectors and male-female cyclists. Forty-three percent of total cyclists who were missing fixed reflectors or around 18 cyclists are male cyclists. The rests or around 57% (23 cyclists) are female.

For side reflectors, 124 cyclists who were missing side-reflectors or about 53% from total cyclists are female cyclists. The rests, 47% or 112 cyclists are male cyclists.

Apparently for cyclists who were missing all, both fixed and side, reflectors are equally divided between male and female cyclists. Each gender have 4 cyclists who missed all reflectors during the observation periods.

For cyclists with missing lights in relation with direction, during the observation periods 105 cyclists or about 51% cyclists were heading Trollebergsvägen / Byggmästaregatan and 49% or 99 cyclists were going to Bantorget direction.

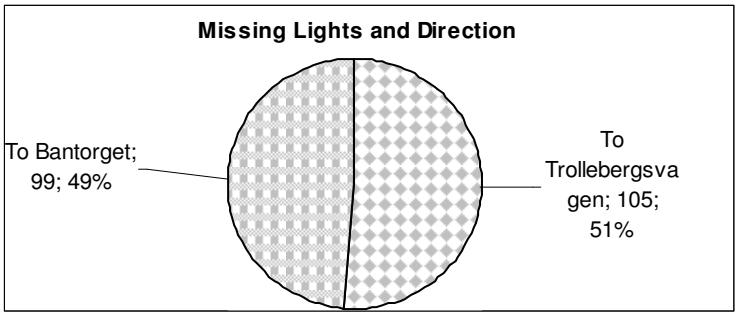



Figure 3.20. Missing Lights in relation with Direction in Trollebergsvägen (Bantorget)

In figure 3.22. cyclists with missing reflectors are mostly heading to Bantorget direction except for cyclists with missing fixed reflectors. Fifty-two percent or about 101 cyclists with missing side-reflectors and 63% percent cyclists who were missing all reflectors were heading Bantorget direction.

For cyclists who were missing fixed-reflectors, there are 52% or 21 cyclists were heading to Trollebergsvägen directions and 20 cyclists or around 48% were heading Bantorget direction (see figure 3.21.).

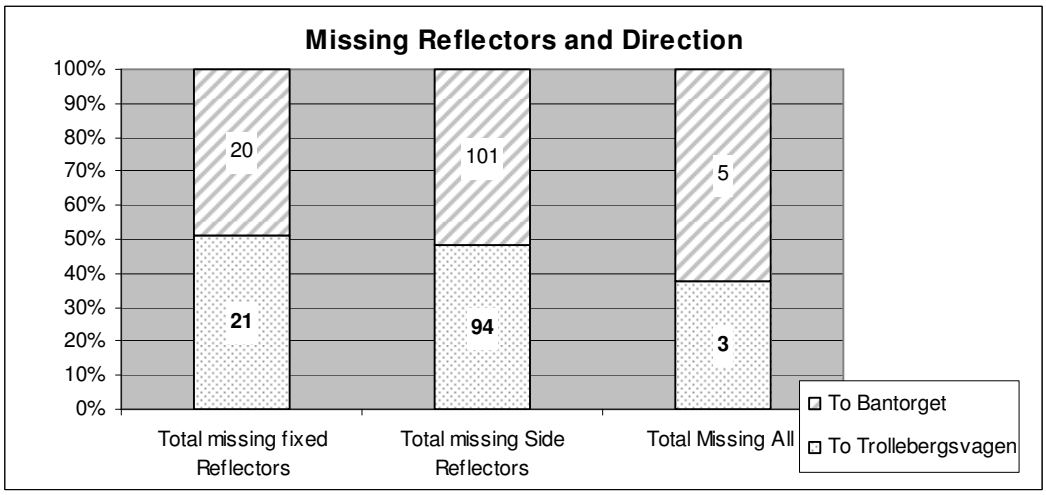



Figure 3.21. Missing Reflectors in relation with Direction in Trollebergsvägen (Bantorget)

Like in Tunavägen-Sångarevägen, there were two cyclists who wore helmets during the observation periods in this location and both of them use their bicycle lamps both front and rear lamps. It means that 100% of cyclists with helmets ON have complete lights on their bicycle.

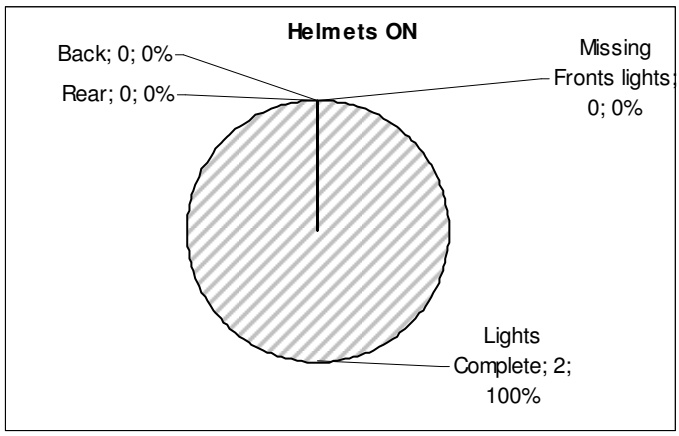



Figure 3.22. Helmets use in relation with bicycle lights use in Trollebergsvägen (Bantorget)

### *3.2.1.5 Lilla Fiskaregatan*

Compared with the other location, this location had the highest number of cyclists. Totalling 254 cyclists passed this location during the observation and 139 among them are female cyclists and 115 are male cyclists.

Table 3.5. Observation Result - Lilla Fiskaregatan

| Time Period | TOTAL Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Front | Rear | Both | Front | Rear | Both | SIDE (WHEEL) | | | All | M | F | | ↓ | ↑ |
| | | | | | | | | Front | Rear | Both | | | | | | |
| 1 | 42 | 7 | 6 | 21 | 3 | 2 | 0 | 9 | 4 | 9 | 3 | 16 | 26 | 0 | 28 | 14 |
| 2 | 42 | 3 | 10 | 15 | 7 | 1 | 1 | 10 | 2 | 11 | 1 | 20 | 22 | 4 | 20 | 22 |
| 3 | 29 | 1 | 5 | 13 | 1 | 0 | 0 | 7 | 2 | 5 | 1 | 13 | 16 | 2 | 14 | 15 |
| 4 | 26 | 2 | 3 | 11 | 0 | 0 | 0 | 5 | 1 | 6 | 1 | 13 | 13 | 0 | 6 | 20 |
| 5 | 29 | 6 | 3 | 14 | 2 | 0 | 0 | 12 | 2 | 8 | 0 | 13 | 16 | 0 | 12 | 17 |
| 6 | 33 | 6 | 4 | 12 | 1 | 1 | 0 | 11 | 4 | 5 | 3 | 15 | 18 | 0 | 24 | 9 |
| 7 | 29 | 2 | 6 | 13 | 0 | 0 | 0 | 8 | 3 | 3 | 1 | 11 | 18 | 0 | 15 | 14 |
| 8 | 24 | 2 | 3 | 9 | 4 | 0 | 0 | 6 | 5 | 8 | 0 | 14 | 10 | 0 | 13 | 11 |
| **Total** | **254** | **29** | **40** | **108** | **18** | **4** | **1** | **68** | **23** | **55** | **10** | **115** | **139** | **6** | **132** | **122** |
| **%** | **100** | **11** | **16** | **43** | **7** | **2** | **0** | **27** | **9** | **22** | **4** | **45** | **55** | **2** | **52** | **48** |

Legend: ↓ Bantorget
↑ Stortorget

In this location, 108 cyclists did not use both front and rear lights which means 43 % out of 254 total cyclists were missing both lights. Sixty-eight cyclists or around 27 % also did not use front-side reflectors and 55 cyclists or 22 % were missing both front and rear side reflectors.

Figure 3.23 and 3.24 show that cyclists with missing lights or reflectors are mostly female cyclists except for cyclists who missed all reflectors, both fixed and side reflectors. For those who missed all reflectors, 80% of cyclists are male cyclists.

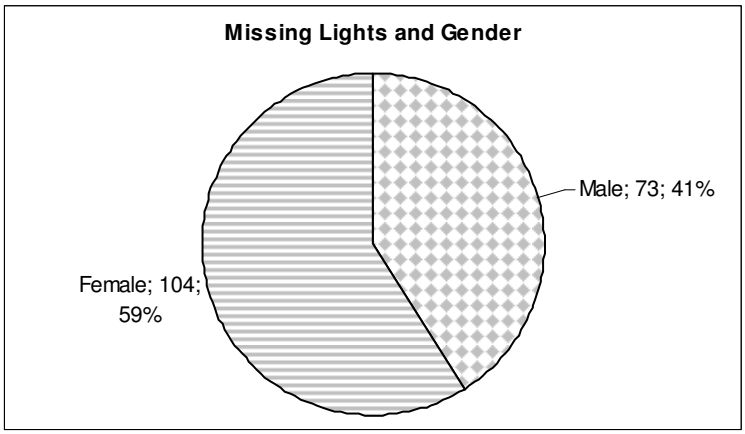



Figure 3.23. Missing Lights in relation with Gender in Lilla Fiskaregatan

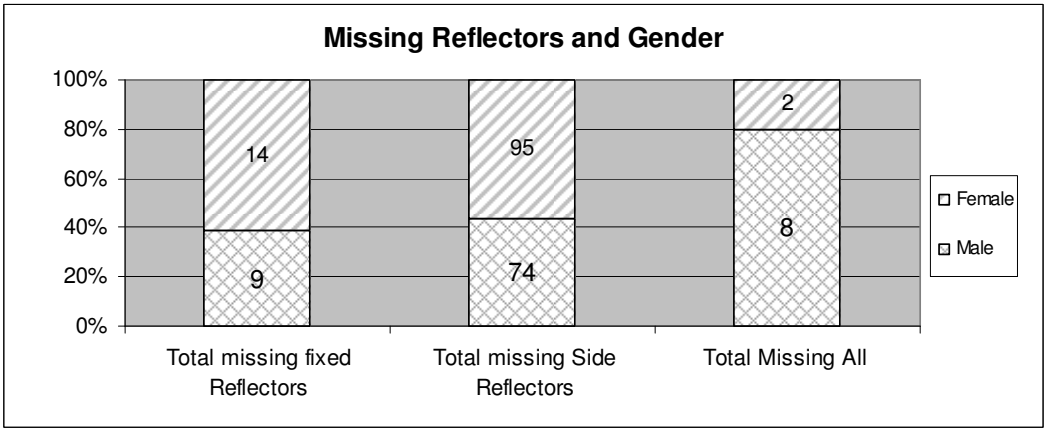



Figure 3.24. Missing Reflectors in relation with Gender in Lilla Fiskaregatan

From figure 3.25 and 3.26., it can be seen that cyclists with missing lights or reflectors are mostly going to Bantorget direction. There are 53% of cyclists who missed bicycle lights and 70% of cyclists who were missing fixed reflectors were heading Bantorget.

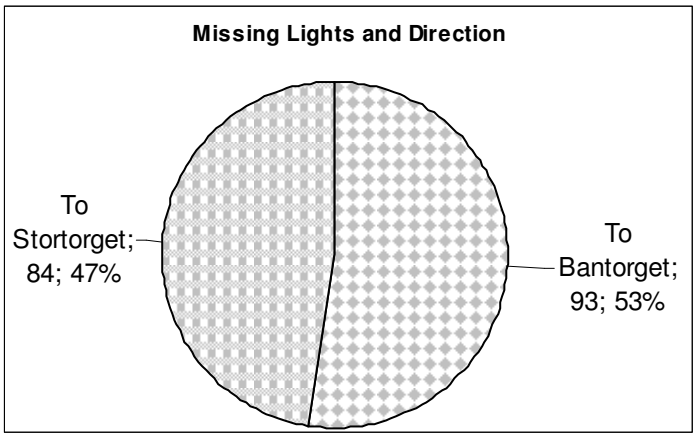



Figure 3.25. Missing Lights in relation with Direction in Lilla Fiskaregatan

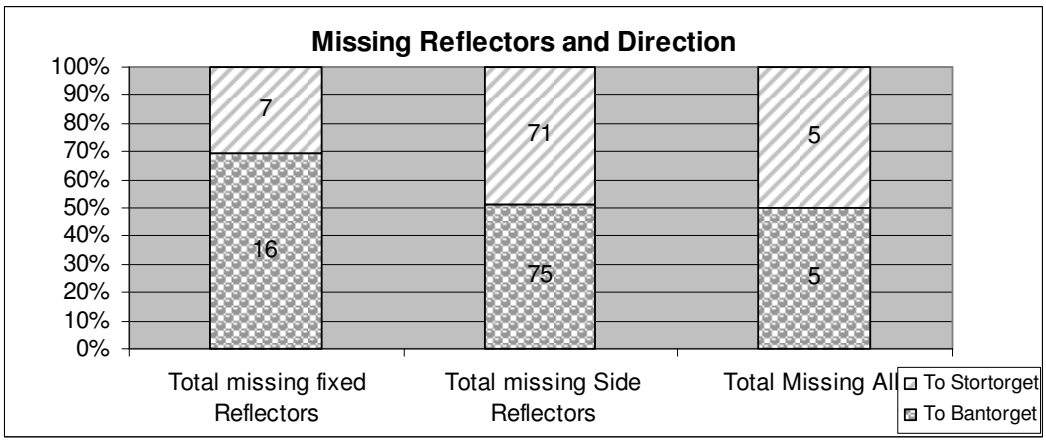



Figure 3.26. Missing Reflectors in relation with Direction in Lilla Fiskaregatan

Relating with helmets use, during the observation periods there are 50% of cyclists with helmets were also have complete lights, 33% of them were missing rear lights and 17% were missing both front and rear lights (see figure 3.27).

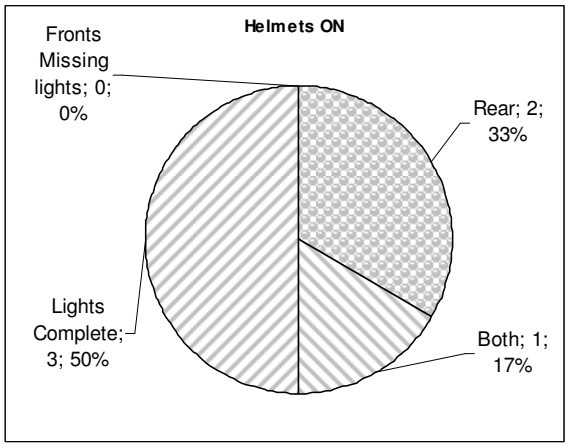



Figure 3.27. Helmets use in relation with bicycle lights use in Lilla Fiskaregatan

### *3.2.1.6 Summary from Behaviour Study*

The behaviour study was conducted in 5 different locations for two-hours of observation for each location. During the observation periods, 892 cyclists were observed, consists of 446 male cyclists and 446 female cyclists (see. Table 3.6.).

Table 3.6. Total number of cyclists observed

| | Allhelgonakyrkan | | Stora Södergatan | | Tunavägen - Sångarevägen | | Trollebergsvagen | | Lilla Fiskaregatan | | TOTAL | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nr | % | Nr | % | Nr | % | Nr | % | Nr | % | | |
| **M** | 85 | 50% | 73 | 60% | 52 | 54% | 121 | 48% | 115 | 45% | 446 | 50% |
| **F** | 84 | 50% | 48 | 40% | 44 | 46% | 131 | 52% | 139 | 55% | 446 | 50% |
| **Total** | 169 | 100% | 121 | 100% | 96 | 100% | 252 | 100% | 254 | 100% | 892 | 100% |

From 892 cyclists, 646 cyclists were missing their lights, either front, rear or both front and rear lights. From Table 3.7. it can be seen that 39% of missing light cyclists or around 348 cyclists are cyclists with both light missing.

Table 3.7. Nr of missing lights cyclists

| | Complete | Missing Front Light | Missing Rear Light | Missing Both Light | Total |
|---|---|---|---|---|---|
| Nr of Cyclists | 250 | 137 | 161 | 348 | 896 |
| | | 646 | | | |
| % | 28% | 15% | 18% | 39% | 100% |
| | | 72% | | | |

Table 3.8. below shows that relating to the gender, there is no significant differences in number between male and female cyclists. There are 325 female cyclists and 321 male cyclists who did not use the lights during darkness.

Table 3.8. Missing Lights and Gender

| | Allhelgonakyrkan | | Stora Södergatan | | Tunavägen - Sångarevägen | | Trollebergsvagen | | Lilla Fiskaregatan | | TOTAL | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | % | Total | % | Total | % | Total | % | Total | % | | |
| **M** | 57 | 53% | 53 | 62% | 40 | 56% | 98 | 48% | 73 | 41% | 321 | 50% |
| **F** | 51 | 47% | 32 | 38% | 32 | 44% | 106 | 52% | 104 | 59% | 325 | 50% |
| **Total** | 108 | 100% | 85 | 100% | 72 | 100% | 204 | 100% | 177 | 100% | 646 | 100% |

Based on the observation in five locations, it was found that cyclists who missed their bicycle lights are likely going away from the city centrum. Around 55% of cyclists with missing light were going from city centre direction and 45% or 290 cyclists were approaching the city centre. The biggest percentage number was in Allhelgonakyrkan where 65% of cyclists were from city centre direction (see Table 3.9).

Table 3.9. Missing Lights and Direction

| | Allhelgonakyrkan | | Stora Södergatan | | Tunavägen - Sångarevägen | | Trollebergsvagen | | Lilla Fiskaregatan | | TOTAL | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | % | Total | % | Total | % | Total | % | Total | % | | |
| From Centrum | 70 | 65% | 46 | 54% | 42 | 58% | 105 | 51% | 93 | 53% | 356 | 55% |
| To Centrum | 38 | 35% | 39 | 46% | 30 | 42% | 99 | 49% | 84 | 47% | 290 | 45% |
| Total | 108 | 100% | 85 | 100% | 72 | 100% | 204 | 100% | 177 | 100% | 646 | 100% |

Table 3.10. shows us the results of helmets use observation. It is conducted as an additional observation to see the correlation between the use of helmets and the use of lights on the bicycle. There are 25 cyclists who wore helmets and 72% of them are male cyclists.

Table 3.10. Helmets Use and Gender

| | Allhelgonakyrkan | | Stora Södergatan | | Tunavägen - Sångarevägen | | Trollebergsvagen | | Lilla Fiskaregatan | | TOTAL | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | % | Total | % | Total | % | Total | % | Total | % | | |
| **M** | 5 | 63% | 6 | 100% | 1 | 33% | 2 | 100% | 4 | 67% | 18 | 72% |
| **F** | 3 | 38% | 0 | 0% | 2 | 67% | 0 | 0% | 2 | 33% | 7 | 28% |
| **Total** | 8 | 100% | 6 | 100% | 3 | 100% | 2 | 100% | 6 | 100% | 25 | 100% |

From 25 cyclists who wore helmets, 17 cyclists have complete lights on their bikes (see table 3.11.). There is strong correlation between the use of helmets and the use of lights on the bicycles where 68% of cyclists with helmets also have complete illumination equipments on the bicycles. Moreover, it is assumed that cyclists with helmets have a better understanding about cycle regulations compare to other cyclists who do not wear helmets.

Table 3.11. Helmets Use and Missing Lights

| | | Allhelgonakyrkan | | Stora Södergatan | | Tunavägen - Sångarevägen | | Trollebergsvagen | | Lilla Fiskaregatan | | TOTAL | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Helmets ON | % | Helmets ON | % | Helmets ON | % | Helmets ON | % | Helmets ON | % | | |
| Missing lights | Fronts | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 |
| | Rear | 0 | 0 | 1 | 17 | 0 | 0 | 0 | 0 | 2 | 33 | 3 | 12 |
| | Both | 2 | 25 | 1 | 17 | 0 | 0 | 0 | 0 | 1 | 17 | 4 | 16 |
| Lights Complete | | 5 | 63 | 4 | 67 | 3 | 100 | 2 | 100 | 3 | 50 | 17 | 68 |
| **TOTAL** | | 8 | 100 | 6 | 100 | 3 | 100 | 2 | 100 | 6 | 100 | 25 | 100 |

## 3.2.2. Results from Interviews

The interviews were conducted on 4– 8 April 2009 and took place in 5 locations where behaviour study was carried out. Like behaviour study, the interviews began from 21.00 when it has been dark and cyclists are required to use bicycle lights.

A hundred cyclists had been interviewed during those periods and related to the gender there is no significant differences between male and female cyclists. There is a small tendency to have more female cyclists than male. From those 100 interviewees, 57 of them are female cyclists and 43 cyclists are male.

The respondents for the interviews are vary between 17 and 55 years old. The percentage distribution shows that the interviewees are dominated by cyclists between 18 and 35 years. The age of 35 is considered to distinguish cyclists who are student and not student. This distinction was carried out related to the cyclists' understanding about regulations. Students that are not Swedish will certainly have the difficulty in understanding the cycle regulation.

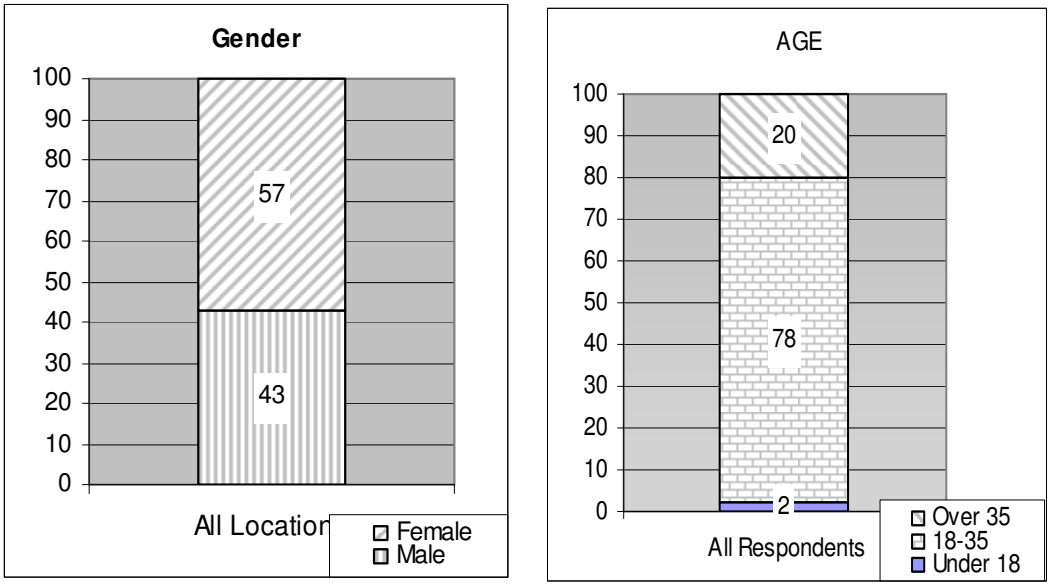



Figure 3.28. Basic Information of Respondents

Interviewer also observed the equipments had by the cyclists related with illumination, front light, rear light dan reflectors. For reflectors, cyclists are considered to have good reflectors if he/she have front and rear fixed reflectors and also front and side reflectors that are mounted on the spokes based on Swedish Road Traffic Act and Regulations.

Question 1: *"Usually, do you use lights when you bicycle in darkness?"*

There are four answer related with this questions, which are always, sometimes, never and it depends. About 46 respondents answered always using lights during darkness and 41 respondents are answered sometimes. It can be assumed that there is a small tendency that female cyclists always use lights during darkness.

There is an interesting thing when we make a correlation between cyclists that answered always-use light and the observation towards the completeness of light and reflectors on their bicycle. Like for example when interview was carried out in Lilla Fiskaregatan, there are 9cyclists who said ALWAYS use bicycle lights but then only 5 cyclists have a proper lights and reflectors. Overall, there are only 12 cyclists with complete lights and reflectors from 46 cyclists answered always use lights.

Moreover, there are 11 cyclists answered that they never use the lights during darkness. When being asked further concerning the reasons, mostly cyclists answered that adequate street lights in their routes made them felt they did not need bicycle lights either as an illumination tool or as an existence marker.

In this interview there are also 2 cyclists who use lights if only he/she remember to bring it with them.

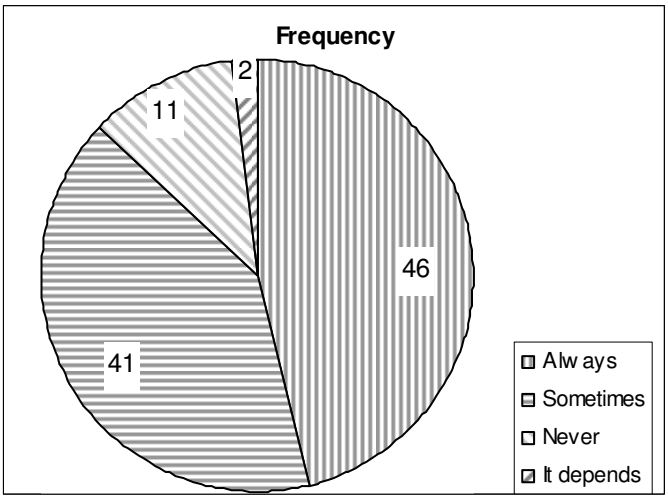



Figure 3.29. Question 1

Question 2: "What is the function of the lights on the bicycles?"

According to the Swedish Road Traffic Acts and Regulations, it is the obligations for the owner of the bicycle, when used in darkness and poor visibility, to have the bicycle equipped with a lamp emitting white or yellow light forwards with an appropriate illumination that he/she can see the road surface forwards at a reasonable distance.

Concerning tail light on the bicycle it is required a lamp emitting red fixed light backwards of such a luminance that the bicycle, when used in darkness, can be observed by other vehicle drivers in a reasonable distance.

So it is clear that regulations obliged cyclists to use the front light with such an illumination that could be used to see the road surface forwards. The emphasis was given to the function of light as an illumination tool rather than existence marker because although street lights in Lund City are good enough b ut there are several locations which did not have enough street lights. So it would be very dangerous for cyclists who had lights only as existence markers. In addition, a bicycle light functioned as an illumination tool, automatically can also be functioned as the existence marker.

According to the interview form, there are 4 possible answer related with the second question, which are, to see the way in darkness, to be seen in the dark, no idea and other.

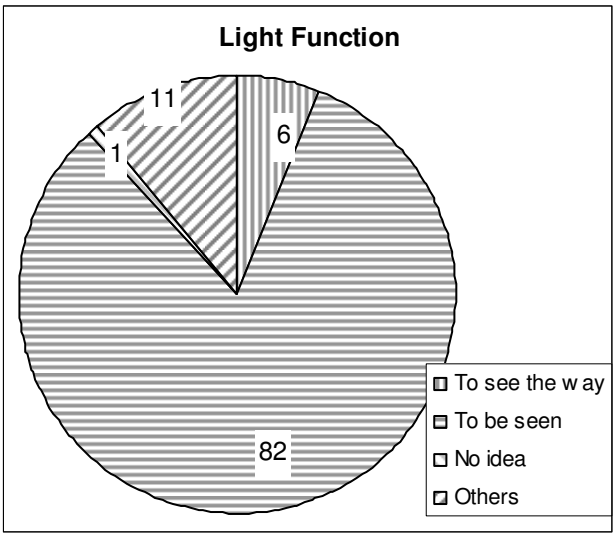



Figure 3.30. Question 2

In the interview process, it was known that 82% cyclists thought that the function of light was to be seen in the dark. They believed that the city of Lund had good street lights environment so what they only needed is tail light that could make them be observed by other road users especially by motorized vehicles. Further, the percentage of cyclists saying that the lights have both function, to see the way and to be seen, is only 11%.

Question 3: *"What do you think about the price of bicycles lights?"*

This question was aimed to know the cyclists' perception concerning the price of bicycle lights. Moreover, the question is also to get information whether the price became some factor that influenced cyclists not to use bicycle light.

There are 3 possible answer: affordable, quite expensive, too expensive. Mostly cyclists said that the price of bicycle lights is not a problem for them. More than half of respondents thought that the bicycle lights are affordable.

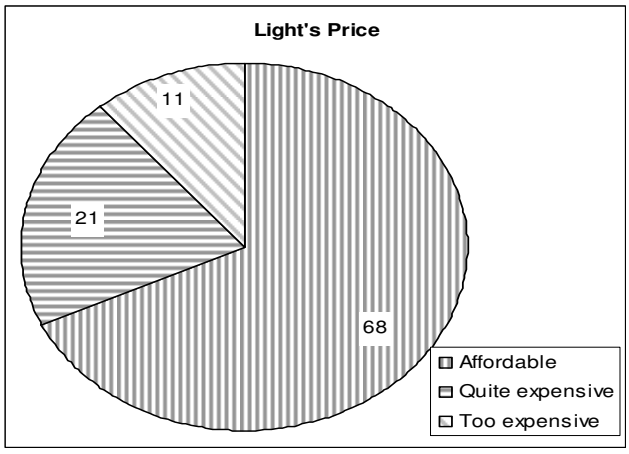



Figure 3.31. Question 3

Question 4, "*Do you know the rules about lights and reflectors on the bicycles?"*

This is an open question and no answers where given, cyclists were free to answer in accordance with their knowledge of the regulations. The results are then summarized into 5 categories (see Appendix 38)

Category 1 (general) is the cyclists' common answer on the regulations. It is given to cyclists who explain that in accordance with the regulation cyclists was obliged to use front and rear lights. Some cyclists also mentioned about the light colour

which is white colour for front and red colour for the rear light. It is the answer that cyclists answered the most where 59 cyclists think so.

Category 2 (penalty) is given to cyclists who explained about the penalty that was received if not using light and reflectors during darkness. According to 20 cyclists that answered this, penalty that was received took the form of the fine with vary amount of money, between 1800 – 3000 Swedish kronor.

Third category (lights and reflectors) is given to cyclists who explain that cyclists' obligation is not only using lights but the reflectors as well. Two cyclists explained that reflector helps other road users especially motorized vehicles to recognize cyclists.

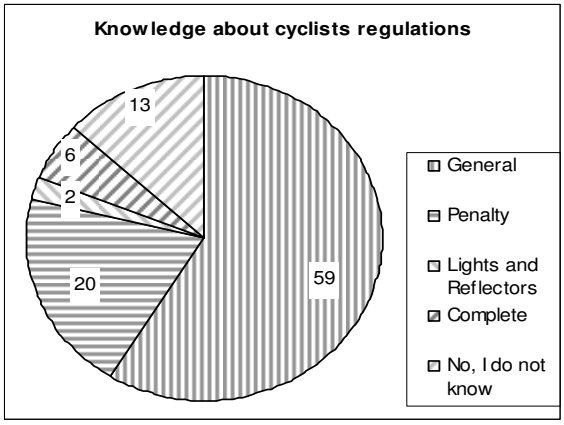



Figure 3.32. Question 4

Complete answer is assigned to cyclists who can explain all about the lights, reflectors and also penalty received by the cyclists. However , six cyclists gave a comprehensive answer concerning cyclist regulations.

Last category is summarized for cyclists who do not know about the Swedish cyclist regulations. Those who do not know about the regulations are mostly students and answered when the interviews was conducted in Stora Södergatan.

# IV. DISCUSSION AND CONCLUSION

## 4.1. Discussion

In behaviour study, the connection between gender and both missing lights are analyzed. This was done to see if there is any differences between the man and the woman in the use of bicycle light. In table 3,8. it shows that gender did not have big influence in the use of bicycle light.

Concerning the locations there are no significant differences in missing lights. Number of cyclists with missing lights are almost the same both in the centrum or outside centrum e.g. in Lilla Fiskaregatan and in Tunavägen - Sångarevägen. In this research are then known that in city center cyclists thought that the environment has sufficient illumination coming from streetlights

Furthermore, cyclists felt safe, that the streetlights illuminate enough the road, and that other road users will be able to see their presence. On the other hand, it is not known what is the primary reason for cyclists not to use lights outside in the centrum. But we can assume that the quiet location and not so many police patrols have become a factor affecting the use of outside light in the centrum.

The next step was interview. It was carried out from 21 o'clock when many cyclists hurried back home. This caused the difficulty to stop cyclists and carried out the interview. In several locations outside centrum, the difficulty in stopping cyclists also experienced. This time, the quiet location factor and the shortage of streetlight made cyclists hesitant to stop.

However, there were 100 cyclists who successfully interviewed randomly. Interview results are then analysed and then used to test the hypotheses.

Hypothesis 1: *More than fifty percent cyclists do not use lights*

Based on the behaviour study, from 892 cyclists there are 646 cyclists do not have complete lights on their bicycle. It means that around 72% of cyclists do not use lights properly as regulated in the Swedish Road Traffic Act and Regulations.

From this result, hypothesis 1 is then approved, more than fifty percent cyclists do not use lights.

Hypothesis 2*: Cyclists do not use lights because of economical reasons;*

It is to remark that Lund is a university city with many foreign students, it was first assumed that the price of lights would be one of the reasons concerning the use of bicycle lights.

From the interview results, there are more than half, around 68% of cyclists thought that the bicycle price is affordable. With these results then the hypothesis 2 is rejected.

Hypothesis 3: *Cyclists do not use lights because they do not know about regulations related with the cyclists' obligation to use the lights during darkness.*

In appendix 44, most cyclists knew the obligation to use lights. However if they were asked further in a more detail then we will get different results e.g. the function of the lamps and the amount of money if we do not use the lights.

From the interview results, the answer concerning this penalty are vary from 600-1800. Swedish Kronor. Whereas based on SFS 1999:178, the penalty is about 300 Swedish Kronor per missing lights

Finally, to sum it up, this hypothesis is approved. Mostly cyclists understand about their obligation to use lights during darkness but it still needs more socialization from the municipality for foreign students. Eventhough the regulations are in Swedish but it can be translated into English for the purpose of socializations.

Hypothesis 4: *There are different perceptions on the use of lights on the bicycles as an illumination tool or just as an existence marker of the cyclists*

The results from the interview (see Appendix 42) show that 82% cyclists believe that the function of the light is to be seen (as an existence marker). On the other hand, according to the regulations, bicycle front-lights shall have an appropriate illumination so the cyclists could see the road surface forwards.

So the fourth hypothesis is approved that there are different perceptions on the use of lights on the bicycles as an illumination tool or just as an existence marker of the cyclists.

## 4.2. Conclusion

The results from behaviour study show that only 28% of cyclists using the lights properly (cyclists use front and rear lights) and 39% of them were totally missing both lights.

The correlation between helmet use and the use of lights also show that 68% of cyclists who use helmet also have complete lights on their bicycle.

From the results of this research, it could be concluded that economical factor especially the price factor is not became the factor that determined the use of bicycle light.

It is known from the results that cyclists know about their obligation to use it. This study also results that cyclists have the knowledge about their obligations to use the lights but during the observation most cyclists did not use the lights properly. It is likely influenced by the perception that the cyclists have about the regulations. The interview results show that most cyclists believe that the function of the light is as an existence marker (to be seen) not to see the way during darkness.

## 4.3. Recommendations

Relating to the findings, the socialization of cycling needs to be done regularly at least once a year. Considering Lund city as a university city with high number of foreign students, the socialization needs to be done at the time students arrive in the city. In addition, the socialization in writing also needs to be done, especially in locations where the students live. To improve foreign students understanding of cycling regulations then it would be useful if the socialization be written in English.

Furthermore, law enforcement by the police needs to be done regularly. It is expected that the cyclists' compliance with rules especially on lighting during darkness will increase if there are control from the police.

## 4.4. Limitations

This research was conducted in May when the darkness begins at 21:00. so it would be useful if this research could be done in March or April. At that time, darkness begins at around 18.00-19.00. This time is the 'rush-hour' for cyclists. It is close to the office hours where people is going home and it is also the time when the stores are closed. By conducting the research at the cyclists' rush-hour, the object observations and interviews can be much more than right now.

For next research, it would be better to have more literatures about cycle illuminations so that the analysis would be more comprehensive.

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Appendix 1. Behaviour study protocol

## Behaviour study: The use of lights on the bicycles

Observer:_____ Date:_____ Time Period:_____

City:_____

Place:_____

Legend: ↓ _____

↑ _____

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front | Rear | Both | Front | Rear | Both | SIDE | | | All | M | F | | ↓ | ↑ |
| | | | | | | | Front Wheel | Rear Wheel | Both Wheel | | | | | | |
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| TOTAL | | | | | | | | | | | | | | | |

Appendix 2: Behaviour study at Allhelgonakyrkan

Observer: Pitra
City: Lund
Place: Allhelgonakyrkan

Time Period: 21.00-21.15 / 21.15-21.30 / 21.30-21.45 / 21.45-22.00 / 22.00-22.15 / 22.15-22.30 / 22.30-22.45 / 22.45-23.00

Date: 2009-04-23

Legend: ↓ Downtown ↑ Sjukhuset

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 1 | | X | | | | | | X | | | | X | | | X |
| 2 | | X | | | | | | | | | X | | | | X |
| 3 | | | X | | | | X | | | | X | | | | X |
| 4 | X | | | | | | X | | | | X | | | X | |
| 5 | | | X | X | | | | | | | X | | | | X |
| 6 | | | X | X | | | | | X | | | X | | X | |
| 7 | | | | | | X | X | | | | X | | | | X |
| 8 | | | | X | | | | | | | | X | | X | |
| 9 | | | X | | | | | | | | | X | | | X |
| 10 | X | | | | | | | | | | X | | | X | |
| 11 | | | | | | | | | | | X | | | X | |
| 12 | | | | | | | | X | | | | X | | X | |
| 13 | | | | | | | | | | | | X | | | X |
| 14 | | | X | | | | | | | | X | | | | X |
| 15 | | X | | | | | X | | | | | X | | X | |
| 16 | | | X | | | | X | | | | | X | | | X |
| 17 | | | | | | | | | | | X | | | X | |
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| 25 | | | | | | | X | | | | X | | | | X |
| 26 | X | | | | | | X | | | | | X | X | X | |
| 27 | | | | | | | | | | | | X | X | | X |
| 28 | | | X | | | | | | | | X | | | | X |
| 29 | | | X | | | X | | | X | | X | | | X | |
| 30 | | | | X | | | X | | | | X | | | | X |
| 31 | | | X | | | | X | | | | X | | | X | |
| 32 | | | X | | | | | | | | | X | | | X |
| 33 | X | | | | | | | | X | | | X | | | X |
| 34 | | X | | | | | | X | | | | X | | X | |
| 35 | | | X | X | | | X | | | | X | | | X | |
| 36 | | | X | | | | X | | | | | X | | X | |
| 37 | | | | | | | | | | | | X | | X | |
| 38 | | X | | | | | | | | | | X | | X | |
| 39 | X | | | X | | | X | | | | | X | | | X |
| 40 | X | | | | | | X | | | | | X | | | X |
| 41 | | | | | | | | X | | | | X | | X | |
| 42 | | | X | | | | | | | | X | | | X | |
| 43 | | X | | | | | | | | | X | | | X | |
| 44 | | | X | | | | | | | X | | X | | | X |
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| 46 | | | | | | | X | | | | | X | | X | |
| 47 | | | | | X | | | X | | | | X | | X | |
| 48 | | | | | | | X | | | | | X | | X | |
| 49 | | | | | | | X | | | | X | | | X | |
| 50 | | | X | | | | | | | | | X | | X | |
| 51 | X | | | | | | | | | | | X | | X | |
| 52 | | | | | | | X | | | | X | | | | X |
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| 56 | | | X | | | | X | | | | X | | | | X |
| 57 | X | | | | | | | X | | | | X | | | X |
| 58 | | X | | | | | | | X | | X | | | X | |
| 59 | | X | | | | | | | X | | X | | | | X |
| 60 | | | | | | | | | | | X | | | X | |
| 61 | | X | | | | | | X | | | | X | | X | |
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| 64 | X | | | | | | X | | | | | X | | | X |
| 65 | | | | | | | | X | | | | X | | | X |
| 66 | | X | | X | | | | | | | | X | | | X |
| 67 | X | | | | | | | | | | X | | | | X |
| 68 | | | | X | | | | | | | X | | | X | |
| 69 | | | X | | | | | | | | | X | | | X |
| 70 | | X | | | | | | | X | | | X | | | X |
| 71 | | | X | X | | | | | X | | X | | | X | |
| 72 | | X | | X | | | X | | | | | X | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
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| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 73 | | | X | X | | | X | | | | | X | | | X |
| 74 | | X | | | | | X | | | | X | | | | X |
| 75 | | | | | | | | | | | X | | X | | X |
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| 78 | | X | | | | | | | | | X | | | X | |
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| 100 | | X | | | | | | | X | | X | | | | X |
| 101 | | X | | | | | X | | | | | X | | | X |
| 102 | | | X | | | | | | | | X | | | X | |
| 103 | | | X | | | | | | X | | X | | | X | |
| 104 | | | | | | | | | X | | | X | | | X |
| 105 | | X | | | X | | | | | | X | | | | X |
| 106 | | | X | | | | | | X | | X | | | | X |
| 107 | | | X | X | | | X | | | | X | | | X | |
| 108 | | | X | | | | X | | | | X | | | X | |
| 109 | | | X | | | | | | X | | X | | | | X |
| 110 | | | | | | | | | | | | X | | | X |
| 111 | | | X | | | | X | | | | X | | | | X |
| 112 | | X | | | | | | | X | | | X | | | X |
| 113 | X | | | | | | | | | | | X | | | X |
| 114 | | | | | | | | X | | | X | | | | X |
| 115 | | | X | | | | X | | | | | X | | | X |
| 116 | | | | | | | | | X | | X | | | | X |
| 117 | | | X | | | | | | X | | X | | | X | |
| 118 | | | | | | | X | | | | | X | | | X |
| 119 | | | X | | | | | | X | | X | | | X | |
| 120 | | | X | | | | | | | | X | | | | X |
| 121 | | | X | | | | | | X | | | X | | X | |
| 122 | | | X | | | | | | X | | | X | | X | |
| 123 | | | | | | | X | | | | | X | | | X |
| 124 | | | X | | X | | | | | | X | | X | | X |
| 125 | | | X | | | | | | | | X | | | | X |
| 126 | | X | | X | | | | | | | | X | | | X |
| 127 | | | X | X | | | | X | | | X | | | | X |
| 128 | | | | | | | | | | | | X | | | X |
| 129 | | | | | | | | | | | | X | | | X |
| 130 | X | | | | | | | | X | | | X | | | X |
| 131 | | | | | | | | X | | | X | | | | X |
| 132 | X | | | | | | | X | | | X | | | | X |
| 133 | | X | | | X | | | X | | | X | | | | X |
| 134 | | | | | | | | | | | X | | X | | X |
| 135 | | | | | | | | | | | X | | | | X |
| 136 | | | | | | | | | | | X | | | | X |
| 137 | | | | | | | | | | | | X | | | X |
| 138 | | X | | | | | | | | | | X | | X | |
| 139 | | X | | | | | X | | | | | X | | | X |
| 140 | | | X | | | | | | | X | X | | | X | |
| 141 | | | X | | | | | | | X | X | | | X | |
| 142 | | | | | | | | | X | | X | | | X | |
| 143 | | | | | | | | | X | | | X | | | X |
| 144 | | | | | | | | | X | | X | | X | | X |
| 145 | | | X | | | | | | X | | | X | | | X |
| 146 | | | X | | | | X | | | | | X | | X | |
| 147 | | | X | | | | | | | | | X | | | X |
| 148 | | | X | | | | | | | | X | | | | X |
| 149 | | X | | | | | | | | | X | | | | X |
| 150 | | | X | X | | | | | X | | X | | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 151 | X | | | X | | | | | | | X | | | | X |
| 152 | | | | | | | | X | | | X | | | | X |
| 153 | | | | | | | X | | | | X | | | | X |
| 154 | | | | | | | | | | | | X | | | X |
| 155 | | | | | | | | | | | | X | | | X |
| 156 | | | | | | | | | X | | | X | | | X |
| 157 | | | | | | | | X | | | | X | | X | |
| 158 | | X | | | | | | X | | | | X | | | X |
| 159 | | X | | | | | | X | | | | X | | | X |
| 160 | | | | | | | | | X | | X | | | | X |
| 161 | | X | | X | | | | | X | | X | | | X | |
| 162 | | | | | | X | | | | | X | | | | X |
| 163 | | | | | | | X | | | | | X | | X | |
| 164 | X | | | | | | | | X | | | X | | | X |
| 165 | | | X | | | | | | | | | X | | | X |
| 166 | X | | | | | | | | | | X | | | | X |
| 167 | | | X | | | | | | | | X | | | | X |
| 168 | X | | | | | | | | | | | X | | | X |
| 169 | | | X | | | | | | | | X | | | | X |

Appendix 3 : Behaviour study at Stora Södergatan

Observer: Pitra
City: Lund
Place: Stora Södergatan

Time Period: 21.00-21.15 / 21.15-21.30 / 21.30-21.45 / 21.45-22.00 / 22.00-22.15 / 22.15-22.30 / 22.30-22.45 / 22.45-23.00

Date: 2009-04-24

Legend: ↓ Esplanaden ↑ Downtown

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 1 | | | X | | | | | | | | | X | | | X |
| 2 | | X | | | | | X | | | | | X | | X | |
| 3 | | X | | | | | | | | | X | | | | X |
| 4 | | X | | | | | | | X | | | X | | | X |
| 5 | | | X | | | | | | X | | X | | | | X |
| 6 | | | X | | | | | | X | | X | | | | X |
| 7 | | | X | X | | | | | | | X | | | | X |
| 8 | | | X | | | X | | | | | X | | | | X |
| 9 | | | | | | | | | | | X | | | X | |
| 10 | | | X | | | | | X | | | X | | | X | |
| 11 | | X | | | | | | | | | | X | | X | |
| 12 | | | | | | | | X | | | X | | | X | |
| 13 | | X | | | | | | X | | | | X | | X | |
| 14 | | X | | | | | X | | | | | X | | X | |
| 15 | | | X | | | | X | | | | | X | | X | |
| 16 | X | | | | | | X | | | | | X | | X | |
| 17 | X | | | | | | | X | | | X | | | X | |
| 18 | | X | | | X | | | | | | X | | | | X |
| 19 | | | | X | | | | | | | | X | | | X |
| 20 | X | | | | | | X | | | | X | | | | X |
| 21 | X | | | | | X | | | | | | X | | | X |
| 22 | | X | | X | | | X | | | | | X | | | X |
| 23 | | X | | | | | | | X | | | X | | | X |
| 24 | | | | | | | X | | | | X | | X | X | |
| 25 | | | X | | | | X | | | | X | | | | X |
| 26 | | X | | | | | | | X | | | X | | X | |
| 27 | | X | | | | | | X | | | X | | | | X |
| 28 | | | X | | | | | | X | | X | | | | X |
| 29 | | | X | | | | | | | | X | | | X | |
| 30 | | X | | | | | | X | | | X | | | X | |
| 31 | | | X | | | | | | X | | | X | | X | |
| 32 | | | X | | | | | | | | X | | | X | |
| 33 | | | | | | | X | | | | | X | | X | |
| 34 | | | X | | | | | | | | X | | | X | |
| 35 | | | | | | | X | | | | X | | | X | |
| 36 | | | | | | | | | | | | X | | X | |
| 37 | | | X | | | | | | | | X | | | X | |
| 38 | | | X | | | | | X | | | X | | | X | |
| 39 | | | X | X | | | | | | | X | | | X | |
| 40 | | | | X | | | | | | | X | | | X | |
| 41 | | | | | | | | | X | | | X | | X | |
| 42 | | | X | | | | X | | | | X | | | | X |
| 43 | | | | X | | | | | | | X | | | X | |
| 44 | | | | X | | | | | | | | X | | X | |
| 45 | | | X | | | | X | | | | X | | | X | |
| 46 | | | | | | | | | | | X | | | X | |
| 47 | | X | | | | | | | | | X | | | X | |
| 48 | | | X | | | | X | | | | X | | | X | |
| 49 | | X | | | | | X | | | | X | | | X | |
| 50 | | | | | | | | | | | | X | | X | |
| 51 | | | X | | | | | | | | | X | | | X |
| 52 | | | X | X | | | | | X | | X | | | | X |
| 53 | | X | | | | | | | | | | X | | X | |
| 54 | | | | | | | | | | | X | | X | X | |
| 55 | X | | | | | | | | X | | X | | | X | |
| 56 | | X | | | | | | X | | | X | | | X | |
| 57 | | X | | | | | | X | | | X | | | X | |
| 58 | | | | X | | | | | | | | X | | X | |
| 59 | | | | | | | | | | | X | | | X | |
| 60 | | | | | | | | | X | | | X | | X | |
| 61 | | | X | | | | X | | | | | X | | | X |
| 62 | | | X | | | | X | | | | | X | | X | |
| 63 | | | X | | | | | | X | | X | | | | X |
| 64 | X | | | | | | X | | | | | X | | | X |
| 65 | | | X | | | | | | X | | | X | | | X |
| 66 | | | X | | | | X | | | | | X | | | X |
| 67 | | X | | | | | | | | | | X | | X | |
| 68 | | | | | | | X | | | | | X | | X | |
| 69 | | | X | | | | X | | | | X | | X | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 70 | | X | | | | | | | | | X | | | X | |
| 71 | | | | X | | | | | | | | X | | X | |
| 72 | | | | X | | | | | | | X | | | X | |
| 73 | | | | | | | | | X | | X | | | | X |
| 74 | | X | | X | | | | | | | X | | X | X | |
| 75 | | | | | | | | | | | X | | | X | |
| 76 | | | X | | | | X | | | | X | | | | X |
| 77 | | | X | | | | X | | | | | X | | | X |
| 78 | | | X | X | | | | | | | X | | | X | |
| 79 | | | X | | | | | | X | | X | | | X | |
| 80 | | | | | | | | | | | X | | X | X | |
| 81 | | | X | | | | X | | | | X | | | | X |
| 82 | | | X | X | | | X | | | | X | | | X | |
| 83 | | | | | | | | | X | | X | | | | X |
| 84 | | | X | | | | | X | | | X | | | | X |
| 85 | | | X | X | | | X | | | | X | | | X | |
| 86 | | | X | | | | | | | | X | | | X | |
| 87 | | | | | | | X | | | | | X | | X | |
| 88 | | | | | | | | | | | X | | | | X |
| 89 | | | X | | | | | | X | | X | | | | X |
| 90 | X | | | | | | | | X | | | X | | | X |
| 91 | | | X | | | | | | X | | X | | | X | |
| 92 | | | X | | | | | | X | | X | | | | X |
| 93 | | | X | | | | X | | | | | X | | | X |
| 94 | | | | | | | X | | | | | X | | X | |
| 95 | | | X | | | | | | | | X | | | X | |
| 96 | | | X | | | | X | | | | | X | | X | |
| 97 | | | X | | | | | | X | | | X | | X | |
| 98 | | | | | | | | | X | | X | | | X | |
| 99 | | | X | | | | | | | | X | | | X | |
| 100 | | | | | | | X | | | | X | | X | X | |
| 101 | | | | | | | | | | | | X | | X | |
| 102 | | | | | | | | | | | X | | | | X |
| 103 | | | X | | | | X | | | | X | | | | X |
| 104 | | X | | | | | X | | | | | X | | | X |
| 105 | | X | | | | | X | | | | | X | | X | |
| 106 | | | | | | | | X | | | | X | | X | |
| 107 | | | X | | | | | | | | X | | | | X |
| 108 | X | | | | | | | | X | | | X | | | X |
| 109 | | X | | | | | | | | | X | | | X | |
| 110 | | | | | | | | | X | | | X | | X | |
| 111 | | | X | | | | | | X | | X | | | X | |
| 112 | | X | | | | | | | | | X | | | X | |
| 113 | | X | | | | | | | X | | | X | | | X |
| 114 | | | X | | | | | | X | | X | | | X | |
| 115 | | | | | | | X | | | | X | | | X | |
| 116 | | | X | | | | | | | | | X | | X | |
| 117 | | | | | | | | | X | | | X | | X | |
| 118 | | | X | | | | | | | | | X | | X | |
| 119 | | | | | | | | | | | | X | | | X |
| 120 | | | | | | | | | | | X | | | | X |
| 121 | | | X | | | | X | | | | X | | | | X |
| 122 | | X | | | | | | | | | X | | | | X |

Appendix 4: Behaviour study at Tunavägen - Sångarevägen

Observer: Pitra
City: Lund
Place: Tunavägen - Sångarevägen

Time Period: 21.00-21.15, 21.15-21.30, 21.30-21.45, 21.45-22.00, 22.00-22.15, 22.15-22.30, 22.30-22.45, 22.45-23.00

Date: 2009-04-27

Legend: ↓ SPARTA, ↑ Linero

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 1 | | | X | | | | X | | | | X | | | | X |
| 2 | | | X | | | | | | | | X | | | X | |
| 3 | | | X | | | | | | X | | X | | | | X |
| 4 | | | X | | | | | | X | | X | | | | X |
| 5 | | | X | | | | | X | | | | X | | | X |
| 6 | | | X | | | | | | X | | | X | | X | |
| 7 | | | X | | | | | | | | X | | | | X |
| 8 | | | X | | | | | X | | | X | | | | X |
| 9 | | | X | | | | | X | | | X | | | | X |
| 10 | | | X | | | | | X | | | X | | | | X |
| 11 | | | X | | | | X | | | | X | | | | X |
| 12 | | | | | | | X | | | | X | | | X | |
| 13 | | | X | | | | | X | | | X | | | | X |
| 14 | | | X | | | | X | | | | X | | | X | |
| 15 | | | X | | | | | | X | | | X | | X | |
| 16 | | X | | | | | | X | | | | X | | X | |
| 17 | | | X | | | | | | X | | X | | | X | |
| 18 | | | X | | | | | | X | | X | | | X | |
| 19 | | | X | | | | | | | | | X | | | X |
| 20 | | | X | | | | X | | | | | X | | | X |
| 21 | | | | | | | | | X | | | X | | | X |
| 22 | | | X | | | | | X | | | X | | | | X |
| 23 | | | X | | | | | | | | X | | | X | |
| 24 | | | X | | | | | | X | | X | | | X | |
| 25 | | | X | | | | | | X | | X | | | X | |
| 26 | | | X | | | | | | | | | X | | | X |
| 27 | X | | | | | | | | X | | X | | | X | |
| 28 | | | | | | | | | X | | | X | | X | |
| 29 | | | X | | | | | | X | | X | | | X | |
| 30 | | | X | | | | | | X | | | X | | X | |
| 31 | | | X | | | | | | X | | | X | | X | |
| 32 | | | | | | | | | X | | | X | X | | X |
| 33 | | | X | | | | X | | | | X | | | X | |
| 34 | | X | | | | | | | X | | | X | | X | |
| 35 | | | | | | | | X | | | X | | | | X |
| 36 | | | X | | | | X | | | | | X | | X | |
| 37 | | | X | | | | | | | | X | | | X | |
| 38 | | | X | | | | X | | | | X | | | X | |
| 39 | | | X | | | | | | X | | | X | | X | |
| 40 | | | X | | | | X | | | | X | | | | X |
| 41 | | | X | | | | | | X | | X | | | X | |
| 42 | | | X | | | | | | X | | | X | | | X |
| 43 | | | X | | | | | | | | X | | | X | |
| 44 | | | X | | | | | | | | | X | | | X |
| 45 | | | X | | | | | | X | | | X | | X | |
| 46 | | | X | | | | | | X | | | X | | | X |
| 47 | | | | | | | X | | | | | X | | X | |
| 48 | | | | | | | | | | | X | | | | X |
| 49 | | | | | | | | X | | | X | | | | X |
| 50 | | | X | | | | | | | | X | | | | X |
| 51 | | | X | | | | | | X | | X | | | | X |
| 52 | | | X | | | | | | X | | | X | | X | |
| 53 | | | | | | | | | | | | X | | | X |
| 54 | | | | | | | | | X | | | X | | | X |
| 55 | | | X | | | | | X | | | | X | | | X |
| 56 | | | | | | | | | | | | X | | | X |
| 57 | X | | | | | | X | | | | | X | | X | |
| 58 | | | | | | | | | | | X | | | | X |
| 59 | | | X | | | | X | | | | | X | | X | |
| 60 | | X | | | | | | X | | | | X | | | X |
| 61 | | | X | | | | X | | | | | X | | | X |
| 62 | | | | | | | | | X | | X | | | | X |
| 63 | | | | | | | | | | | | X | | X | |
| 64 | | | X | | | | | | X | | | X | | | X |
| 65 | | | X | | | | X | | | | X | | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 66 | | | X | | | | | X | | | X | | | | X |
| 67 | | | X | | | | | X | | | X | | | | X |
| 68 | | | | | | | | | | | | X | X | | X |
| 69 | | | X | | | | | | X | | X | | | X | |
| 70 | | | X | | X | | | | | | | X | | | X |
| 71 | | | | | | | | | | | X | | X | | X |
| 72 | X | | | | | | | | X | | | X | | X | |
| 73 | | | X | | | | | | X | | X | | | X | |
| 74 | | | | | | | | | | | | X | | | X |
| 75 | | | X | | | | | X | | | | X | | | X |
| 76 | | | | | | | X | | | | | X | | X | |
| 77 | | X | | | | | X | | | | X | | | | X |
| 78 | | | | | | | | | X | | X | | | X | |
| 79 | | | X | | | | | X | | | X | | | | X |
| 80 | | X | | | | | | X | | | | X | | | X |
| 81 | | X | | | | | | X | | | | X | | | X |
| 82 | | | | | | | X | | | | | X | | | X |
| 83 | | X | | | | | X | | | | X | | | X | |
| 84 | X | | | | | | X | | | | X | | | | X |
| 85 | | | | X | | | | X | | | X | | | | X |
| 86 | | | | | | | | X | | | X | | | | X |
| 87 | | | | | | | X | | | | X | | | | X |
| 88 | X | | | | | | | X | | | X | | | | X |
| 89 | | X | | | | | | | X | | | X | | | X |
| 90 | | X | | | | | | | | | X | | | | X |
| 91 | | | X | | | | | | | | | X | | X | |
| 92 | | | X | | | | X | | | | | X | | | X |
| 93 | | | | | | | | | | | X | | | X | |
| 94 | | | X | | | | | | | | X | | | | X |
| 95 | | | X | | | | X | | | | | X | | | X |
| 96 | | X | | | | | | X | | | X | | | | X |

Appendix 5: Behaviour study at Trollebergsvägen (Bantorget)

Observer: Pitra
City: Lund
Place: Trollebergsvagen

Time Period: 21.00-21.15 / 21.15-21.30 / 21.30-21.45 / 21.45-22.00 / 22.00-22.15 / 22.15-22.30 / 22.30-22.45 / 22.45-23.00

Date: 2009-04-28

Legend: ↓ Trollebergsvagen ↑ Bantorget

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 1 | | | X | X | | | | | | | | X | | X | |
| 2 | | X | | | | | | | X | | X | | | X | |
| 3 | | X | | | | | | | | | X | | | X | |
| 4 | | | X | | X | | | X | | | | X | | X | |
| 5 | X | | | | | | | X | | | | X | | | X |
| 6 | | | X | | | | | | X | | X | | | | X |
| 7 | | | X | | | | | | X | | | X | | X | |
| 8 | X | | | | | | X | | | | X | | | X | |
| 9 | | | | | | | X | | | | X | | | | X |
| 10 | X | | | | | | X | | | | | X | | | X |
| 11 | | | X | | | X | X | | | | | X | | X | |
| 12 | | | | | | | | | X | | X | | | X | |
| 13 | X | | | | | | X | | | | | X | | X | |
| 14 | X | | | | | | | | X | | | X | | X | |
| 15 | | | X | | | | | X | | | | X | | X | |
| 16 | X | | | | | | | X | | | | X | | | X |
| 17 | | X | | | X | | | | | | | X | | | X |
| 18 | | | X | | | | | | X | | X | | | X | |
| 19 | | X | | | | | | X | | | | X | | | X |
| 20 | | | | | | | | | | | X | | X | X | |
| 21 | | | | | | | | | | | X | | | | X |
| 22 | | | X | | | X | X | | | | | X | | X | |
| 23 | | | X | | | | | X | | | | X | | X | |
| 24 | | | | | | | | | | | X | | | | X |
| 25 | | | X | | | | | | | X | | X | | | X |
| 26 | | | X | | | | | | | X | X | | | | X |
| 27 | | X | | | X | | | | | | X | | | X | |
| 28 | X | | | | | | X | | | | | X | | X | |
| 29 | X | | | | | | | | X | | | X | | X | |
| 30 | | | X | | | | | | X | | | X | | X | |
| 31 | | X | | | | | | | | X | | X | | X | |
| 32 | X | | | | | | | | X | | X | | | X | |
| 33 | | | X | | | | | | | | | X | | X | |
| 34 | X | | | | | | | | X | | | X | | X | |
| 35 | X | | | | | | | X | | | X | | | | X |
| 36 | | X | | | | | | | | | X | | | | X |
| 37 | | X | | | | | | X | | | | X | | X | |
| 38 | | | X | X | | | X | | | | | X | | | X |
| 39 | | | X | | | | | | | | X | | | X | |
| 40 | | | | X | | | X | | | | | X | | | X |
| 41 | | X | | | | | | X | | | | X | | | X |
| 42 | | | | | | | | | | | | X | | | X |
| 43 | | | X | | | | | | X | | | X | | X | |
| 44 | X | | | | | | X | | | | | X | | | X |
| 45 | X | | | X | | | | X | | | X | | | X | |
| 46 | X | | | | X | | | X | | | X | | | X | |
| 47 | | | | | | | | | X | | | X | | X | |
| 48 | | X | | | | | | X | | | X | | | | X |
| 49 | X | | | | | | X | | | | X | | | X | |
| 50 | | | X | | | | X | | | | X | | | X | |
| 51 | | X | | | | | | | X | | X | | | | X |
| 52 | X | | | | X | | | X | | | X | | | X | |
| 53 | X | | | | | | X | | | | | X | | | X |
| 54 | | | | | | | | X | | | | X | | X | |
| 55 | | X | | | | | | | X | | | X | | X | |
| 56 | | X | | X | | | | X | | | | X | | | X |
| 57 | | | X | | | | | | | X | X | | | | X |
| 58 | X | | | | | | | | | | X | | | X | |
| 59 | | X | | | | | X | | | | | X | | X | |
| 60 | | | X | | | | | | X | | | X | | | X |
| 61 | | | | | | | | | | | X | | X | X | |
| 62 | | | X | | | | | | X | | | X | | X | |
| 63 | | X | | | | | X | | | | | X | | | X |
| 64 | X | | | X | | | X | | | | | X | | | X |
| 65 | | X | | | | | | X | | | X | | | X | |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 66 | X | | | | | | | X | | | | X | | X | |
| 67 | | | X | | | | | | X | | | X | | | X |
| 68 | X | | | X | | | | X | | | | X | | | X |
| 69 | X | | | | | | | X | | | X | | | X | |
| 70 | | X | | | | | | X | | | | X | | | X |
| 71 | | | X | | | | | X | | | X | | | | X |
| 72 | | X | | | | | | | X | | X | | | X | |
| 73 | | X | | | | | | | X | | | X | | X | |
| 74 | X | | | X | | | | | | | | X | | X | |
| 75 | | | | | | | | X | | | X | | | | X |
| 76 | | | | | | | X | | | | X | | | | X |
| 77 | | | X | | | | | | X | | X | | | X | |
| 78 | X | | | X | | | | | | | | X | | | X |
| 79 | | | X | | | | | | | X | | X | | X | |
| 80 | | | | | | | | | | | X | | | | X |
| 81 | X | | | | | | X | | | | | X | | | X |
| 82 | | | | | | | X | | | | | X | | X | |
| 83 | X | | | | | | | X | | | X | | | X | |
| 84 | | | X | | | | | | | X | X | | | | X |
| 85 | | X | | | | | | X | | | | X | | X | |
| 86 | X | | | X | | | | | | | | X | | X | |
| 87 | | X | | | | | X | | | | X | | | | X |
| 88 | | X | | | | | | | X | | | X | | X | |
| 89 | | | X | | | | | X | | | X | | | | X |
| 90 | X | | | X | | | X | | | | X | | | X | |
| 91 | | X | | | | | | X | | | | X | | | X |
| 92 | | X | | | | | | | | | X | | | X | |
| 93 | X | | | | | | X | | | | X | | | | X |
| 94 | X | | | X | | | | | | | | X | | X | |
| 95 | | X | | | | | | | X | | X | | | | X |
| 96 | | | X | | | | | | X | | X | | | | X |
| 97 | | X | | | | | | X | | | X | | | | X |
| 98 | X | | | X | | | | | | | | X | | X | |
| 99 | | | X | | | | | | | | | X | | X | |
| 100 | | X | | | | | | | | | X | | | | X |
| 101 | X | | | | | | | X | | | X | | | | X |
| 102 | X | | | | | | | X | | | X | | | | X |
| 103 | | | X | | | | | | X | | | X | | X | |
| 104 | X | | | X | | | | X | | | | X | | | X |
| 105 | | X | | | | | X | | | | X | | | | X |
| 106 | | X | | | | | | | | | X | | | X | |
| 107 | X | | | | | | | X | | | | X | | X | |
| 108 | X | | | | | | X | | | | | X | | | X |
| 109 | | | X | | | | | | X | | X | | | X | |
| 110 | X | | | | | | | X | | | | X | | | X |
| 111 | X | | | | | | X | | | | X | | | X | |
| 112 | X | | | | | | | X | | | | X | | X | |
| 113 | X | | | | | | X | | | | X | | | X | |
| 114 | | X | | | | | | | | | X | | | | X |
| 115 | | | | | | | X | | | | | X | | X | |
| 116 | X | | | X | | | | X | | | | X | | X | |
| 117 | X | | | | | | | X | | | X | | | | X |
| 118 | | | | | | | | X | | | | X | | X | |
| 119 | X | | | | | | | | | | | X | | | X |
| 120 | | | | | | | | | | | X | | | X | |
| 121 | | | X | | | | | | X | | | X | | X | |
| 122 | | | | | | | X | | | | X | | | | X |
| 123 | X | | | | | | X | | | | | X | | X | |
| 124 | | | X | X | | | | X | | | X | | | X | |
| 125 | X | | | | | | | | X | | | X | | | X |
| 126 | | | | X | | | | X | | | X | | | | X |
| 127 | | | | | | | | | | | X | | | | X |
| 128 | X | | | | | | | | X | | X | | | | X |
| 129 | | X | | | | | X | | | | | X | | X | |
| 130 | | | X | | | | X | | | | | X | | X | |
| 131 | X | | | | | | | | X | | | X | | X | |
| 132 | | | | | | | | | | | X | | | | X |
| 133 | | | | | | | X | | | | X | | | X | |
| 134 | | | | | | | | X | | | | X | | | X |
| 135 | | | X | | | | | | X | | X | | | | X |
| 136 | | | X | X | | | | X | | | X | | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 137 | X | | | | | | X | | | | | X | | X | |
| 138 | | | | | | | | | | | | X | | X | |
| 139 | | | X | X | | | X | | | | X | | | | X |
| 140 | X | | | | | | | | X | | | X | | | X |
| 141 | | | | | | | | X | | | | X | | X | |
| 142 | | | X | | | | X | | | | X | | | | X |
| 143 | X | | | | | | X | | | | | X | | X | |
| 144 | | | | | | | | | X | | | X | | X | |
| 145 | X | | | | | | | | X | | X | | | X | |
| 146 | | | X | X | | | X | | | | | X | | | X |
| 147 | | | | | | | | | X | | X | | | | X |
| 148 | | X | | | | | | X | | | X | | | | X |
| 149 | | | | | | | | | X | | | X | | X | |
| 150 | | | X | | | | X | | | | | X | | X | |
| 151 | X | | | | | | | | | | X | | | X | |
| 152 | | | X | | | | X | | | | X | | | X | |
| 153 | | | | | | | | X | | | | X | | | X |
| 154 | | | X | | | | | X | | | X | | | | X |
| 155 | | | X | | X | | | | X | | X | | | | X |
| 156 | | | X | | | | | | X | | | X | | | X |
| 157 | | | X | | | | | | | | X | | | | X |
| 158 | X | | | X | | | X | | | | X | | | X | |
| 159 | X | | | | | | X | | | | | X | | X | |
| 160 | | | X | | X | | | | X | | X | | | | X |
| 161 | | X | | | | | X | | | | X | | | X | |
| 162 | | X | | | | | | | | | | X | | X | |
| 163 | | | X | | | | | | X | | X | | | | X |
| 164 | X | | | | | | | | | | X | | | | X |
| 165 | | | | | | | X | | | | | X | | | X |
| 166 | X | | | X | | | | | X | | X | | | X | |
| 167 | | | X | | | | X | | | | X | | | | X |
| 168 | | | X | | | | | | | | | X | | X | |
| 169 | X | | | | | | X | | | | | X | | X | |
| 170 | | X | | | | | | X | | | X | | | | X |
| 171 | | | | | | | X | | | | X | | | | X |
| 172 | | X | | | | | | | X | | X | | | | X |
| 173 | | X | | | | | | X | | | X | | | | X |
| 174 | | | X | | X | | | | X | | X | | | X | |
| 175 | X | | | | | | | X | | | | X | | X | |
| 176 | | | | | | | | | | | | X | | X | |
| 177 | | | | | | | X | | | | X | | | | X |
| 178 | X | | | | | | | | | | | X | | X | |
| 179 | | | X | | X | | | | X | | | X | | | X |
| 180 | | | X | | | | | | X | | X | | | X | |
| 181 | | | | | | | | | | | X | | | X | |
| 182 | | | | | | | X | | | | X | | | | X |
| 183 | | | X | X | | | | X | | | X | | | | X |
| 184 | X | | | | | | | X | | | | X | | X | |
| 185 | | X | | | | | | | X | | | X | | | X |
| 186 | X | | | | | | | X | | | | X | | | X |
| 187 | | | | | | | X | | | | | X | | | X |
| 188 | | | X | | | | X | | | | | X | | X | |
| 189 | | X | | | | | | X | | | | X | | | X |
| 190 | X | | | | | | | X | | | | X | | | X |
| 191 | | | | | | | | | | | | X | | | X |
| 192 | | X | | | | | X | | | | X | | | X | |
| 193 | | | X | | | | | | X | | | X | | | X |
| 194 | | | X | | | | X | | | | X | | | X | |
| 195 | | X | | | | | | X | | | X | | | | X |
| 196 | X | | | | | | | X | | | X | | | | X |
| 197 | | | X | X | | | | | X | | | X | | X | |
| 198 | | X | | | | | X | | | | X | | | X | |
| 199 | X | | | | | | | X | | | X | | | | X |
| 200 | | X | | | | | X | | | | | X | | | X |
| 201 | | | | | | | | | | | | X | | X | |
| 202 | | | X | | | | | X | | | X | | | | X |
| 203 | X | | | | | | | | X | | X | | | | X |
| 204 | | X | | | | | X | | | | | X | | X | |
| 205 | | X | | | | | | X | | | X | | | | X |
| 206 | | | X | | | | X | | | | X | | | X | |
| 207 | X | | | | | | X | | | | X | | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 208 | | | X | | | | | | X | | | X | | | X |
| 209 | X | | | | | | | | X | | | X | | | X |
| 210 | | | | | | | | | X | | | X | | X | |
| 211 | | | X | | | | X | | | | X | | | X | |
| 212 | | | X | | | | X | | | | X | | | X | |
| 213 | | | | | | | | X | | | | X | | | X |
| 214 | | | | | | | X | | | | X | | | | X |
| 215 | X | | | | | | | | | | | X | | | X |
| 216 | | | X | | | | | X | | | X | | | X | |
| 217 | | | X | | | | | | X | | | X | | | X |
| 218 | | | X | | | | | | X | | X | | | X | |
| 219 | | | X | | | | X | | | | X | | | X | |
| 220 | | X | | | | | | | | | X | | | | X |
| 221 | | X | | | X | | | | | | X | | | X | |
| 222 | X | | | | X | | | | | | | X | | | X |
| 223 | | X | | | | | | | X | | | X | | X | |
| 224 | | X | | | | | | | | | | X | | X | |
| 225 | | | X | | | | X | | | | | X | | X | |
| 226 | | | X | | | | | X | | | X | | | X | |
| 227 | | X | | | | | | | | | | X | | | X |
| 228 | X | | | | | | | | | | | X | | | X |
| 229 | X | | | | | | | | X | | | X | | | X |
| 230 | X | | | | | | | | | X | | X | | | X |
| 231 | X | | | | | | | | | X | X | | | X | |
| 232 | | X | | | | | | X | | | X | | | | X |
| 233 | | | X | X | | | | X | | | | X | | | X |
| 234 | | | X | | | | | X | | | | X | | | X |
| 235 | X | | | | | | | | X | | X | | | X | |
| 236 | | | | | | | | | X | | X | | | | X |
| 237 | | | X | X | | | X | | | | X | | | X | |
| 238 | | | X | | | | | X | | | X | | | X | |
| 239 | X | | | | | | | | | | | X | | X | |
| 240 | | | | | | | X | | | | | X | | X | |
| 241 | | | | | | | | | X | | | X | | | X |
| 242 | X | | | | | | X | | | | | X | | | X |
| 243 | | X | | | X | | | | | | | X | | | X |
| 244 | | X | | | | | | X | | | | X | | | X |
| 245 | | | X | | | | X | | | | X | | | | X |
| 246 | | | | | | | | | X | | | X | | | X |
| 247 | | | X | X | | | | | X | | X | | | | X |
| 248 | | | X | | | | X | | | | X | | | X | |
| 249 | | | X | | | | X | | | | | X | | | X |
| 250 | | | | | | | | | | | | X | | X | |
| 251 | | | | | | | | X | | | X | | | | X |
| 252 | | | | | | | | X | | | | X | | | X |

Appendix 6: Behaviour study at Lilla Fiskaregatan

Observer: Pitra
City: Lund
Place: Lilla Fiskaregatan

Time Period: 21.00-21.15 / 21.15-21.30 / 21.30-21.45 / 21.45-22.00 / 22.00-22.15 / 22.15-22.30 / 22.30-22.45 / 22.45-23.00

Date: 2009-04-29

Legend: ↓ Bantorget ↑ Stortorget

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 1 | X | | | | | | | | X | | | X | | | X |
| 2 | | | X | | | | | | X | | | X | | X | |
| 3 | X | | | | | | X | | | | X | | | X | |
| 4 | | | X | | | | X | | | | X | | | X | |
| 5 | X | | | | | | | X | | | | X | | | X |
| 6 | | | X | | | | X | | | | X | | | X | |
| 7 | | | | | | | | | | | | X | | X | |
| 8 | | | X | | | | | X | | | X | | | X | |
| 9 | | | X | | | | | | X | | X | | | | X |
| 10 | | | X | | | | | | X | | X | | | | X |
| 11 | | | X | | | | X | | | | X | | | X | |
| 12 | | X | | | | | | | | | | X | | | X |
| 13 | | X | | | X | | | | | | | X | | X | |
| 14 | X | | | | X | | | | | | | X | | X | |
| 15 | | | | | | | | | X | | | X | | | X |
| 16 | | | | | | | | | | | X | | | | X |
| 17 | | | | | | | X | | | | | X | | | X |
| 18 | | | | | | | | X | | | | X | | | X |
| 19 | | | X | | | | | | | | | X | | X | |
| 20 | | X | | | | | | | | | | X | | X | |
| 21 | | | X | | | | | | X | | | X | | X | |
| 22 | | | X | | | | | | | X | | X | | X | |
| 23 | | | X | | | | | | | X | | X | | X | |
| 24 | | X | | | | | | X | | | | X | | | X |
| 25 | X | | | X | | | | | | | | X | | X | |
| 26 | | | X | | | | | | | | | X | | X | |
| 27 | | | | | | | X | | | | X | | | | X |
| 28 | X | | | | | | X | | | | | X | | X | |
| 29 | | | X | | | | | | | | X | | | X | |
| 30 | | | X | X | | | | | X | | X | | | X | |
| 31 | | | | | | | | | | | | X | | X | |
| 32 | | | X | | | | | | | | | X | | X | |
| 33 | | | X | | | | | | | | | X | | X | |
| 34 | | | | | | | | | | | X | | | | X |
| 35 | | | X | | | | | | X | | X | | | | X |
| 36 | | | X | | | | X | | | | | X | | X | |
| 37 | | | X | | | | | | | X | X | | | | X |
| 38 | | X | | X | | | X | | | | | X | | X | |
| 39 | | X | | | | | | | | | X | | | X | |
| 40 | | | X | | | | | | | | | X | | X | |
| 41 | X | | | | | | | | | | | X | | X | |
| 42 | | | X | | | | | | X | | X | | | X | |
| 43 | | | | | | | | | X | | | X | | | X |
| 44 | | X | | | | | X | | | | | X | | X | |
| 45 | | | X | X | | | | | X | | | X | | | X |
| 46 | | | X | | | | | | | | | X | | X | |
| 47 | | | | X | | | | | | | X | | | X | |
| 48 | | | | | | | | | | X | X | | | | X |
| 49 | | X | | X | | | | | X | | | X | | X | |
| 50 | | | | | | | | | X | | X | | | X | |
| 51 | | X | | | X | | | | X | | X | | | X | |
| 52 | | X | | | | | | | X | | X | | | | X |
| 53 | | X | | X | | | X | | | | | X | | X | |
| 54 | | | X | X | | | | | | | X | | | | X |
| 55 | | | X | | | | X | | | | | X | | | X |
| 56 | | | | | | | | | X | | X | | | X | |
| 57 | | | | | | | | | X | | X | | | X | |
| 58 | X | | | | | | X | | | | | X | | | X |
| 59 | | | X | | | | | X | | | | X | | | X |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 60 | | | X | | | | X | | | | | X | | X | |
| 61 | | | | | | | | | | | X | | X | X | |
| 62 | | X | | | | | | | X | | X | | | | X |
| 63 | | | X | X | | | X | | | | | X | | X | |
| 64 | | | X | | | | | | | | | X | | X | |
| 65 | | | | | | | | | | | X | | | | X |
| 66 | | | | | | | | | | | X | | | X | |
| 67 | | X | | | | | | | | | | X | X | | X |
| 68 | | | X | | | | X | | | | | X | | | X |
| 69 | | X | | | | | X | | | | X | | X | X | |
| 70 | | X | | | | | | | X | | | X | | | X |
| 71 | X | | | | | | | | | | X | | | | X |
| 72 | X | | | | | | | | | | X | | | | X |
| 73 | | | X | | | | | | | | X | | | X | |
| 74 | | | X | | | | | | | | | X | | X | |
| 75 | | | X | X | | | | | | | | X | | | X |
| 76 | | | X | | | | | | | | | X | | | X |
| 77 | | | X | | | | | | | | X | | | | X |
| 78 | | | | | | | | | | | X | | X | | X |
| 79 | | X | | | | | | X | | | | X | | X | |
| 80 | | | | | | | | | | | X | | | X | |
| 81 | | | | | | | X | | | | | X | | X | |
| 82 | | | | | | | | | X | | X | | | | X |
| 83 | | | | | | | X | | | | | X | | | X |
| 84 | | | X | | | X | | | | | | X | | | X |
| 85 | | X | | | | | | | X | | X | | | X | |
| 86 | | X | | | | | X | | | | | X | | X | |
| 87 | X | | | | | | | | X | | X | | | | X |
| 88 | | | X | | | | X | | | | X | | | X | |
| 89 | | | | | | | X | | | | | X | | X | |
| 90 | | X | | | | | | | X | | X | | | X | |
| 91 | | | | | | | | | | | | X | | X | |
| 92 | | | X | | | | | | | | | X | | | X |
| 93 | | | | | | | | | | | | X | | | X |
| 94 | | | X | | | | | | | X | X | | | X | |
| 95 | | | | | | | | | | | | X | | | X |
| 96 | | | X | X | | | X | | | | | X | | | X |
| 97 | | | | | | | | X | | | X | | X | | X |
| 98 | | X | | | | | | | X | | X | | | | X |
| 99 | | | X | | | | | | | | | X | | X | |
| 100 | | | X | | | | | | X | | | X | | X | |
| 101 | | | X | | | | | | | | | X | | X | |
| 102 | | X | | | | | | | | | | X | X | X | |
| 103 | | | | | | | | | | | X | | | | X |
| 104 | | | | | | | X | | | | | X | | | X |
| 105 | | | X | | | | | | | | X | | | | X |
| 106 | | | X | | | | | | | | | X | | | X |
| 107 | | | X | | | | X | | | | X | | | X | |
| 108 | | | X | | | | | | | | | X | | | X |
| 109 | | | X | | | | | | | | | X | | | X |
| 110 | | | | | | | X | | | | X | | | | X |
| 111 | | | X | | | | | | | | | X | | | X |
| 112 | | | | | | | | | | | X | | | X | |
| 113 | X | | | | | | | X | | | X | | | X | |
| 114 | | | X | | | | X | | | | X | | | | X |
| 115 | X | | | | | | | X | | | X | | | | X |
| 116 | | | | | | | | | | | | X | | | X |
| 117 | | X | | | | | | | | | | X | | | X |
| 118 | | | X | | | | | | X | | X | | | | X |
| 119 | | X | | | | | | | X | | X | | | | X |
| 120 | | | X | | | | | | X | | X | | | | X |
| 121 | | | X | | | | | | | | | X | | X | |
| 122 | | | | | | | | | | | X | | | | X |
| 123 | X | | | | | | X | | | | | X | | | X |
| 124 | | | | | | | | | | | X | | | X | |
| 125 | | | | | | | | | | | X | | | X | |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 126 | | | | | | | | | | | X | | | | X |
| 127 | | | X | | | | | | X | | | X | | | X |
| 128 | | | X | | | | | | X | | | X | | | X |
| 129 | | | X | | | | X | | | | | X | | | X |
| 130 | | X | | | | | | | | | | X | | | X |
| 131 | | | X | | | | | | X | | | X | | | X |
| 132 | | | | | | | | | | | X | | | X | |
| 133 | | | X | | | | | | | X | X | | | X | |
| 134 | | | | | | | | | | | X | | | | X |
| 135 | | | | | | | | | | | | X | | | X |
| 136 | | | X | | | | | | | | | X | | | X |
| 137 | | | X | | | | X | | | | | X | | | X |
| 138 | | | | | | | X | | | | | X | | | X |
| 139 | | | | | | | | | | | X | | | X | |
| 140 | X | | | | | | | | | | | X | | X | |
| 141 | X | | | | | | X | | | | X | | | | X |
| 142 | X | | | | | | | | X | | X | | | | X |
| 143 | | | X | | | | | | X | | | X | | | X |
| 144 | X | | | | | | X | | | | | X | | X | |
| 145 | | | | | | | | | | | X | | | X | |
| 146 | | | X | | | | X | | | | | X | | | X |
| 147 | | | | | | | X | | | | | X | | X | |
| 148 | | | X | | | | | | | | X | | | | X |
| 149 | | | X | | | | | X | | | X | | | X | |
| 150 | | | X | | | | X | | | | X | | | | X |
| 151 | | | X | | | | X | | | | X | | | | X |
| 152 | | | X | | | | | | X | | | X | | | X |
| 153 | X | | | | | | | | | | | X | | | X |
| 154 | X | | | | | | | | | | | X | | | X |
| 155 | | | | | | | X | | | | | X | | X | |
| 156 | | X | | | | | | | X | | X | | | | X |
| 157 | | | X | | | | X | | | | X | | | | X |
| 158 | | X | | | | | | X | | | X | | | | X |
| 159 | | | | | | | | | | | | X | | | X |
| 160 | | | X | X | | | X | | | | | X | | X | |
| 161 | | | X | | | | X | | | | | X | | X | |
| 162 | | | X | | | | | | X | | X | | | X | |
| 163 | | | X | | | | X | | | | | X | | X | |
| 164 | | | | X | | | | | X | | X | | | X | |
| 165 | | | | | | | X | | | | X | | | | X |
| 166 | | X | | | | | | | X | | | X | | X | |
| 167 | | | X | | | | | | | | | X | | | X |
| 168 | | | X | | | | | | X | | | X | | | X |
| 169 | | | X | | | | X | | | | | X | | | X |
| 170 | | | X | | X | | | X | | | | X | | X | |
| 171 | | X | | | | | | | | | | X | | X | |
| 172 | | | | | | | X | | | | | X | | X | |
| 173 | | | | | | | | X | | | | X | | | X |
| 174 | X | | | | | | | X | | | | X | | X | |
| 175 | X | | | | | | X | | | | X | | | | X |
| 176 | | | X | | | | | | X | | X | | | | X |
| 177 | | | | | | | | | X | | | X | | X | |
| 178 | | | X | | | | | | | X | X | | | | X |
| 179 | | X | | | | | | | | | X | | | | X |
| 180 | | | | | | | X | | | | | X | | | X |
| 181 | | | X | | | | | | | X | X | | | X | |
| 182 | X | | | | | | | | | | | X | | X | |
| 183 | X | | | | | | | | | | | X | | X | |
| 184 | | | | | | | | | | | | X | | X | |
| 185 | | | | X | | | X | | | | X | | | X | |
| 186 | X | | | | | | X | | | | | X | | X | |
| 187 | | | X | | | | | | X | | X | | | X | |
| 188 | | | | | | | | | | | X | | | X | |
| 189 | | | | | | | | | X | | | X | | X | |
| 190 | | | | | | | | | | | X | | | | X |
| 191 | | | X | | | | X | | | | | X | | X | |

| Nr | MISSING LIGHTS | | | MISSING REFLECTOR | | | | | | | Gender | | Helmet ON | Direction | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | | |
| | Front | Rear | Both | Front | Rear | Both | Front Wheel | Rear Wheel | Both Wheel | All | M | F | | ↓ | ↑ |
| 192 | X | | | | | | X | | | | X | | | X | |
| 193 | | X | | | | | | | | | | X | | X | |
| 194 | | X | | | | | X | | | | X | | | X | |
| 195 | | | X | | | | | | X | | X | | | X | |
| 196 | | | | | | | X | | | | X | | | X | |
| 197 | | | | | | | X | | | | | X | | X | |
| 198 | | | X | | | | | | | | X | | | X | |
| 199 | | | X | | | | | | | | | X | | X | |
| 200 | | | X | | | | | | | | | X | | X | |
| 201 | | | X | | | | | X | | | X | | | | X |
| 202 | | X | | | | | X | | | | | X | | | X |
| 203 | X | | | | | | X | | | | | X | | | X |
| 204 | | | X | | | | | X | | | | X | | X | |
| 205 | | | | | | | | | | | | X | | X | |
| 206 | | | | | | | | | | | X | | | | X |
| 207 | X | | | | | | | | X | | | X | | X | |
| 208 | | X | | | | | | | X | | X | | | X | |
| 209 | | | | | | | | | | | | X | | X | |
| 210 | | | X | | | | X | | | | | X | | X | |
| 211 | | | X | | | | | | | | X | | | | X |
| 212 | | | X | | | | | | X | | | X | | X | |
| 213 | | | X | | | | | | | | X | | | X | |
| 214 | | | | | | | X | | | | | X | | X | |
| 215 | | | | | | | X | | | | | X | | X | |
| 216 | | | | | | | | | | | X | | | | X |
| 217 | | X | | | | | | | | | X | | | X | |
| 218 | | X | | | | | | X | | | | X | | | X |
| 219 | | | X | | | | | | | | X | | | X | |
| 220 | | | X | | | | | | | | X | | | X | |
| 221 | | | X | | | | | | | | | X | | X | |
| 222 | | | X | | | | | | | | | X | | | X |
| 223 | | | | | | | | | | | X | | | | X |
| 224 | | | X | | | | X | | | | | X | | | X |
| 225 | | X | | | | | | X | | | | X | | | X |
| 226 | | | X | | | | | | | X | X | | | | X |
| 227 | | | X | | | | | | | | | X | | | X |
| 228 | | X | | | | | X | | | | | X | | X | |
| 229 | | | | | | | | | | | | X | | | X |
| 230 | | | X | | | | X | | | | X | | | | X |
| 231 | | | X | | | | | | | | X | | | X | |
| 232 | | | | | | | | | | | X | | | X | |
| 233 | | | X | | | | | | X | | X | | | X | |
| 234 | | | | | | | | | | | X | | | | X |
| 235 | | | | | | | | | X | | X | | | X | |
| 236 | | | | | | | X | | | | | X | | | X |
| 237 | | | | | | | | | | | | X | | | X |
| 238 | X | | | | | | | X | | | | X | | | X |
| 239 | | | X | X | | | X | | | | X | | | X | |
| 240 | | | | | | | | | | | X | | | | X |
| 241 | | | | | | | | | X | | X | | | X | |
| 242 | | | | | | | | | X | | X | | | X | |
| 243 | | | X | | | | | X | | | | X | | | X |
| 244 | | | | | | | | | X | | | X | | X | |
| 245 | | X | | | | | | X | | | | X | | | X |
| 246 | | X | | | | | X | | | | X | | | | X |
| 247 | | | X | | | | | | X | | | X | | | X |
| 248 | | | X | | | | | | X | | X | | | X | |
| 249 | | X | | | | | | X | | | | X | | X | |
| 250 | | | X | | | | | X | | | X | | | X | |
| 251 | | | | X | | | X | | | | | X | | X | |
| 252 | | | X | X | | | X | | | | X | | | | X |
| 253 | X | | | | | | X | | | | | X | | X | |
| 254 | | | X | X | | | | | X | | X | | | | X |

Appendix 7. Missing Reflectors and Gender in Allhelgonakyrkan

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| Male | 13 | 59% | 5 | 83% | 4 | 100% | 19 | 49% | 10 | 48% | 17 | 50% | 3 | 75% |
| Female | 9 | 41% | 1 | 17% | 0 | 0% | 20 | 51% | 11 | 52% | 17 | 50% | 1 | 25% |
| Total | 22 | 100% | 6 | 100% | 4 | 100% | 39 | 100% | 21 | 100% | 34 | 100% | 4 | 100% |

Appendix 8. Missing Lights and Gender in Allhelgonakyrkan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| Male | 7 | 37% | 14 | 44% | 36 | 63% |
| Female | 12 | 63% | 18 | 56% | 21 | 37% |
| Total | 19 | 100% | 32 | 100% | 57 | 100% |

Appendix 9. Helmet Use and Gender in Allhelgonakyrkan

| | HELMETS | |
|---|---|---|
| | ON | % |
| Male | 5 | 63% |
| Female | 3 | 38% |
| Total | 8 | 100% |

Appendix 10. Helmet Use and Missing Lights in Allhelgonakyrkan

| | | Helmets ON | % |
|---|---|---|---|
| Missing lights | Fronts | 1 | 13% |
| | Rear | 0 | 0% |
| | Both | 2 | 25% |
| Lights Complete | | 5 | 63% |
| **TOTAL** | | 8 | 100% |

Appendix 11. Missing Lights and Direction in Allhelgonakyrkan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| ↓ To Downtown | 5 | 26% | 11 | 34% | 22 | 39% |
| ↑ To Sjukhuset | 14 | 74% | 21 | 66% | 35 | 61% |
| Total | 19 | 100% | 32 | 100% | 57 | 100% |

Appendix 12. Missing Reflectors and Direction in Allhelgonakyrkan

| ↓ ↑ | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| To Downtown | 10 | 45% | 2 | 33% | 1 | 25% | 15 | 38% | 8 | 38% | 14 | 41% | 2 | 50% |
| To Sjukhuset | 12 | 55% | 4 | 67% | 3 | 75% | 24 | 62% | 13 | 62% | 20 | 59% | 2 | 50% |
| Total | 22 | 100% | 6 | 100% | 4 | 100% | 39 | 100% | 21 | 100% | 34 | 100% | 4 | 100% |

Appendix 13. Missing Reflectors and Gender in Stora Södergatan

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| Male | 10 | 67% | 1 | 100% | 1 | 50% | 17 | 49% | 9 | 82% | 15 | 54% | 0 | #DIV/0! |
| Female | 5 | 33% | 0 | 0% | 1 | 50% | 18 | 51% | 2 | 18% | 13 | 46% | 0 | #DIV/0! |
| Total | 15 | 100% | 1 | 100% | 2 | 100% | 35 | 100% | 11 | 100% | 28 | 100% | 0 | #DIV/0! |

Appendix 14. Missing Lights and Gender in Stora Södergatan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| Male | 3 | 38% | 13 | 50% | 37 | 73% |
| Female | 5 | 63% | 13 | 50% | 14 | 27% |
| Total | 8 | 100% | 26 | 100% | 51 | 100% |

Appendix 15. Helmet Use and Gender in Stora Södergatan

| | HELMETS | |
|---|---|---|
| | ON | % |
| Male | 6 | 100% |
| Female | 0 | 0% |
| Total | 6 | 100% |

Appendix 16. Helmet Use and Missing Lights in Stora Södergatan

| | | Helmets ON | % |
|---|---|---|---|
| Missing lights | Fronts | 0 | 0% |
| | Rear | 1 | 17% |
| | Both | 1 | 17% |
| Lights Complete | | 4 | 67% |
| **TOTAL** | | 6 | 100% |

Appendix 17. Missing Lights and Direction in Stora Södergatan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| To Esplanaden | 3 | 38% | 17 | 65% | 26 | 51% |
| To Downtown | 5 | 63% | 9 | 35% | 25 | 49% |
| Total | 8 | 100% | 26 | 100% | 51 | 100% |

Appendix 18. Missing Reflectors and Direction in Stora Södergatan

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| To Esplanaden | 11 | 73% | 0 | 0% | 0 | 0% | 20 | 57% | 9 | 82% | 13 | 46% | 0 | #DIV/0! |
| To Downtown | 4 | 27% | 1 | 100% | 2 | 100% | 15 | 43% | 2 | 18% | 15 | 54% | 0 | #DIV/0! |
| Total | 15 | 100% | 1 | 100% | 2 | 100% | 35 | 100% | 11 | 100% | 28 | 100% | 0 | #DIV/0! |

Appendix 19. Missing Reflectors and Gender in Tunavägen - Sångarevägen

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % | SIDE | | | | | | All | % |
| | | | | | | | Front | % | Rear | % | Both | % | | |
| Male | 1 | 100% | 0 | 0% | 0 | - | 12 | 55% | 14 | 67% | 14 | 45% | 0 | - |
| Female | 0 | 0% | 1 | 100% | 0 | - | 10 | 45% | 7 | 33% | 17 | 55% | 0 | - |
| Total | 1 | 100% | 1 | 100% | 0 | - | 22 | 100% | 21 | 100% | 31 | 100% | 0 | - |

Appendix 20. Missing Lights and Gender in Tunavägen - Sångarevägen

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| Male | 3 | 60% | 4 | 40% | 33 | 58% |
| Female | 2 | 40% | 6 | 60% | 24 | 42% |
| Total | 5 | 100% | 10 | 100% | 57 | 100% |

Appendix 21. Helmet Use and Gender in Tunavägen - Sångarevägen

| | HELMETS | |
|---|---|---|
| | ON | % |
| Male | 1 | 33% |
| Female | 2 | 67% |
| Total | 3 | 100% |

Appendix 22. Helmet Use and Missing Lights in Tunavägen - Sångarevägen

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| ↓ | 2 | 40% | 3 | 30% | 25 | 44% |
| ↑ | 3 | 60% | 7 | 70% | 32 | 56% |
| Total | 5 | 100% | 10 | 100% | 57 | 100% |

Appendix 23. Missing Lights and Direction in Tunavägen - Sångarevägen

| | | Helmets ON | % |
|---|---|---|---|
| Missing lights | Fronts | 0 | 0% |
| | Rear | 0 | 0% |
| | Both | 0 | 0% |
| Lights Complete | | 3 | 100% |
| **TOTAL** | | 3 | 100% |

Appendix 24. Missing Reflectors and Direction in Tunavägen - Sångarevägen

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % | SIDE | | | | | | All | % |
| | | | | | | | Front Wheel | % | Rear Wheel | % | Both Wheel | % | | |
| ↓ | 0 | 0% | 0 | 0% | 0 | - | 10 | 45% | 1 | 5% | 20 | 65% | 0 | - |
| ↑ | 1 | 100% | 1 | 100% | 0 | - | 12 | 55% | 20 | 95% | 11 | 35% | 0 | - |
| Total | 1 | 100% | 1 | 100% | 0 | - | 22 | 100% | 21 | 100% | 31 | 100% | 0 | - |

Appendix 25. Missing Reflectors and Gender in Trollebergsvagen

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % | SIDE | | | | | | All | % |
| | | | | | | | Front Wheel | % | Rear Wheel | % | Both Wheel | % | | |
| Male | 11 | 41% | 7 | 58% | 0 | 0% | 34 | 50% | 33 | 49% | 27 | 45% | 4 | 50% |
| Female | 16 | 59% | 5 | 42% | 2 | 100% | 34 | 50% | 34 | 51% | 33 | 55% | 4 | 50% |
| Total | 27 | 100% | 12 | 100% | 2 | 100% | 68 | 100% | 67 | 100% | 60 | 100% | 8 | 100% |

Appendix 26. Missing Lights and Gender in Trollebergsvagen

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| Male | 29 | 38% | 28 | 53% | 41 | 55% |
| Female | 47 | 62% | 25 | 47% | 34 | 45% |
| Total | 76 | 100% | 53 | 100% | 75 | 100% |

Appendix 27. Helmet Use and Gender in Trollebergsvagen

| | HELMETS | |
|---|---|---|
| | ON | % |
| Male | 2 | 100% |
| Female | 0 | 0% |
| Total | 2 | 100% |

Appendix 28. Helmet Use and Missing Lights in Trollebergsvagen

| | | Helmets ON | % |
|---|---|---|---|
| Missing lights | Fronts | 0 | 0% |
| | Rear | 0 | 0% |
| | Back | 0 | 0% |
| Lights Complete | | 2 | 100% |
| **TOTAL** | | 2 | 100% |

Appendix 29. Missing Lights and Direction

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| To Trollebergsvagen | 41 | 54% | 23 | 43% | 41 | 55% |
| To Bantorget | 35 | 46% | 30 | 57% | 34 | 45% |
| Total | 76 | 100% | 53 | 100% | 75 | 100% |

Appendix 30. Missing Reflectors and Direction in Trollebergsvagen

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % | SIDE | | | | | | All | % |
| | | | | | | | Front Wheel | % | Rear Wheel | % | Both Wheel | % | | |
| To Trollebergsvagen | 13 | 48% | 6 | 50% | 2 | 100% | 38 | 56% | 24 | 36% | 32 | 53% | 3 | 38% |
| To Bantorget | 14 | 52% | 6 | 50% | 0 | 0% | 30 | 44% | 43 | 64% | 28 | 47% | 5 | 63% |
| Total | 27 | 100% | 12 | 100% | 2 | 100% | 68 | 100% | 67 | 100% | 60 | 100% | 8 | 100% |

Appendix 31. Missing Reflectors and Gender in Lilla Fiskaregatan

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| Male | 8 | 44% | 1 | 25% | 0 | 0% | 24 | 35% | 8 | 35% | 33 | 60% | 8 | 80% |
| Female | 10 | 56% | 3 | 75% | 1 | 100% | 44 | 65% | 15 | 65% | 22 | 40% | 2 | 20% |
| Total | 18 | 100% | 4 | 100% | 1 | 100% | 68 | 100% | 23 | 100% | 55 | 100% | 10 | 100% |

Appendix 32. Missing Lights and Gender in Lilla Fiskaregatan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| Male | 9 | 31% | 16 | 40% | 48 | 44% |
| Female | 20 | 69% | 24 | 60% | 60 | 56% |
| Total | 29 | 100% | 40 | 100% | 108 | 100% |

Appendix 33. Helmet Use and Gender in Lilla Fiskaregatan

| | HELMETS | |
|---|---|---|
| | ON | % |
| Male | 4 | 67% |
| Female | 2 | 33% |
| Total | 6 | 100% |

Appendix 34. Helmet Use and Missing Lights in Lilla Fiskaregatan

| | | Helmets ON | % |
|---|---|---|---|
| Missing lights | Fronts | 0 | 0% |
| | Rear | 2 | 33% |
| | Both | 1 | 17% |
| Lights Complete | | 3 | 50% |
| **TOTAL** | | 6 | 100% |

Appendix 35. Missing Lights and Direction in Lilla Fiskaregatan

| | MISSING LIGHTS | | | | | |
|---|---|---|---|---|---|---|
| | Front | % | Rear | % | Both | % |
| To Bantorget | 15 | 52% | 22 | 55% | 56 | 52% |
| To Stortorget | 14 | 48% | 18 | 45% | 52 | 48% |
| Total | 29 | 100% | 40 | 100% | 108 | 100% |

Appendix 36. Missing Reflectors and Direction in Lilla Fiskaregatan

| | MISSING REFLECTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SIDE | | | | | | | |
| | Front | % | Rear | % | Both | % | Front Wheel | % | Rear Wheel | % | Both Wheel | % | All | % |
| To Bantorget | 12 | 67% | 4 | 100% | 0 | 0% | 38 | 56% | 9 | 39% | 28 | 51% | 5 | 50% |
| To Stortorget | 6 | 33% | 0 | 0% | 1 | 100% | 30 | 44% | 14 | 61% | 27 | 49% | 5 | 50% |
| Total | 18 | 100% | 4 | 100% | 1 | 100% | 68 | 100% | 23 | 100% | 55 | 100% | 10 | 100% |

Appendix 37: Interview Protocol

Lunds Tekniska Högskola,
Instutionen för Teknik och samhälle,
Trafik och väg

## Interview with cyclists

Interviewer: Date: Time:

City: Place:

Weather : ☐ Dry ☐ Rain

Age : Sex:

1. Usually, do you use lights when you bicycle in darkness?

☐ Always ☐ Sometimes ☐ Never

☐ It depends : _____

2. What is the function of the lights on the bicycles?

☐ To see the way in darkness ☐ To be seen in the dark ☐ No idea

☐ Other _____

3. What do you think about the price of the bicycles' light?

☐ Affordable ☐ Quite expensive ☐ Too expensive

4. Do you know the rules about lights and reflectors on the bicycles?

☐ Yes, I know it ☐ No, I do not know

Can you describe them:

_____

_____

_____

Thank you very much for your help.

Own Observation :

☐ Front Light On ☐ Rear Light On ☐ Reflexes OK

Appendix 38: Interviews Results

Interviewer: Pitra
Date: 4-8 June 2009

Place: Lilla Fiskaregatan, Trollebergsvagen, Allhelgonakyrkan, Tunavägen - Sångarevägen, Stora Södergatan

Time: 21.00 - 24.00
Weather: Dry

| Respondents | Gender | Age | Question 1 | Question 2 | Question 3 | Question 4 | | Own Observation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Front Light On | Rear Light On | Reflexes OK |
| 1 | Female | 26 | Sometimes | To be seen | Quite expensive | Yes, I know | General | - | - | V |
| 2 | Female | 25 | Never | No idea | Affordable | Yes, I know | General | - | - | V |
| 3 | Male | 50 | Sometimes | To be seen | Quite expensive | Yes, I know | Penalty | V | - | - |
| 4 | Female | 27 | Sometimes | To be seen | Affordable | Yes, I know | General | - | V | V |
| 5 | Female | 30 | Always | To be seen | Too expensive | Yes, I know | General | V | V | V |
| 6 | Female | 20 | Sometimes | To be seen | Too expensive | Yes, I know | General | - | V | V |
| 7 | Female | 25 | Always | To be seen | Too expensive | Yes, I know | Complete | - | - | V |
| 8 | Female | 27 | Sometimes | To be seen | Too expensive | Yes, I know | Penalty | V | - | - |
| 9 | Female | 45 | Always | To be seen | Quite expensive | Yes, I know | Penalty | V | V | V |
| 10 | Female | 30 | Sometimes | To be seen | Affordable | Yes, I know | General | V | V | - |
| 11 | Female | 26 | Sometimes | To be seen | Quite expensive | Yes, I know | General | V | - | - |
| 12 | Female | 26 | Sometimes | To be seen | Affordable | No, I do not know | - | V | - | - |
| 13 | Female | 35 | Always | To be seen | Affordable | Yes, I know | General | V | - | - |
| 14 | Male | 30 | Always | To be seen | Affordable | Yes, I know | General | - | - | - |
| 15 | Female | 50 | Always | To be seen | Quite expensive | Yes, I know | General | V | - | - |
| 16 | Male | 50 | Always | To see the way | Affordable | Yes, I know | General | V | - | - |
| 17 | Female | 25 | Sometimes | To be seen | Quite expensive | Yes, I know | General | - | - | - |
| 18 | Male | 30 | Always | Police Avoidance | Affordable | Yes, I know | General | V | V | V |
| 19 | Female | 25 | Always | Police Avoidance | Affordable | Yes, I know | General | V | V | V |
| 20 | Female | 20 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | V | V |
| 21 | Male | 20 | Sometimes | To be seen | Quite expensive | Yes, I know | General | V | V | - |
| 22 | Female | 25 | Never | To be seen | Too expensive | Yes, I know | General | - | V | - |
| 23 | Female | 25 | Never | Both | Too expensive | Yes, I know | Lights, Reflectors | - | - | - |
| 24 | Female | 25 | Never | To be seen | Affordable | Yes, I know | General | - | - | - |
| 25 | Female | 30 | Never | To be seen | Too expensive | Yes, I know | General | - | - | V |
| 26 | Female | 30 | Always | To be seen | Affordable | Yes, I know | General | V | V | V |
| 27 | Female | 20 | Sometimes | Both | Quite expensive | Yes, I know | Lights, Reflectors | - | V | - |
| 28 | Female | 25 | Sometimes | To be seen | Quite expensive | Yes, I know | General | - | V | - |
| 29 | Male | 37 | Always | Police Avoidance | Affordable | Yes, I know | General | V | V | - |
| 30 | Male | 30 | Always | To be seen | Affordable | Yes, I know | General | V | V | - |
| 31 | Female | 25 | Sometimes | To be seen | Affordable | Yes, I know | General | V | - | V |
| 32 | Female | 25 | Always | To be seen | Affordable | Yes, I know | Complete | V | V | V |
| 33 | Male | 30 | Sometimes | To be seen | Affordable | Yes, I know | General | V | - | - |
| 34 | Female | 27 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 35 | Female | 37 | Always | To see the way | Affordable | Yes, I know | General | - | V | - |
| 36 | Female | 30 | Sometimes | To be seen | Affordable | Yes, I know | General | V | V | - |
| 37 | Male | 38 | Sometimes | To be seen | Affordable | Yes, I know | General | - | V | - |
| 38 | Male | 39 | Sometimes | To be seen | Affordable | Yes, I know | General | - | V | - |
| 39 | Male | 25 | Sometimes | To be seen | Affordable | Yes, I know | General | V | V | - |
| 40 | Female | 40 | Always | To be seen | Affordable | Yes, I know | General | V | V | - |
| 41 | Male | 25 | Sometimes | Both | Affordable | No, I do not know | - | - | V | V |
| 42 | Male | 30 | Never | To be seen | Affordable | No, I do not know | - | V | - | - |
| 43 | Male | 26 | Never | To be seen | Quite expensive | No, I do not know | - | - | - | V |
| 44 | Female | 21 | Always | To see the way | Affordable | Yes, I know | General | V | V | V |
| 45 | Female | 20 | Always | To be seen | Affordable | Yes, I know | General | V | V | - |
| 46 | Male | 27 | Never | To be seen | Quite expensive | No, I do not know | - | - | V | - |
| 47 | Male | 24 | Always | To obey the rule | Affordable | Yes, I know | General | V | - | V |
| 48 | Female | 28 | Always | Both | Affordable | No, I do not know | - | V | - | - |
| 49 | Female | 22 | Always | To be seen | Affordable | Yes, I know | General | V | - | V |
| 50 | Male | 25 | Sometimes | To be seen | Affordable | No, I do not know | - | - | - | V |
| 51 | Male | 25 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | V | V |
| 52 | Female | 31 | Never | To be seen | Affordable | Yes, I know | General | - | - | V |
| 53 | Female | 23 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | V | - |
| 54 | Male | 24 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 55 | Male | 28 | s if I have the | To be seen | Affordable | Yes, I know | Penalty | V | - | V |
| 56 | Male | 23 | Always | To be seen | Quite expensive | Yes, I know | General | V | V | - |
| 57 | Male | 27 | Sometimes | To be seen | Affordable | No, I do not know | - | V | - | V |
| 58 | Female | 27 | Sometimes | To be seen | Affordable | No, I do not know | - | - | V | V |
| 59 | Female | 24 | s if I have the | To be seen | Affordable | No, I do not know | - | V | V | - |
| 60 | Female | 34 | Sometimes | To be seen | Quite expensive | Yes, I know | General | - | V | V |
| 61 | Female | 25 | Always | To be seen | Too expensive | Yes, I know | General | V | V | V |
| 62 | Female | 40 | Always | To be seen | Quite expensive | Yes, I know | General | V | V | - |
| 63 | Female | 45 | Always | To be seen | Too expensive | Yes, I know | General | - | - | V |
| 64 | Male | 25 | Never | To be seen | Too expensive | Yes, I know | General | - | - | V |
| 65 | Female | 35 | Sometimes | To be seen | Quite expensive | Yes, I know | General | V | V | - |
| 66 | Male | 25 | Sometimes | To be seen | Affordable | Yes, I know | General | - | V | - |
| 67 | Female | 20 | Always | To be seen | Affordable | Yes, I know | General | V | V | - |
| 68 | Female | 26 | Sometimes | To be seen | Affordable | Yes, I know | General | V | - | - |
| 69 | Male | 25 | Always | To see the way | Affordable | Yes, I know | General | V | - | - |
| 70 | Male | 30 | Sometimes | To be seen | Quite expensive | Yes, I know | General | V | - | V |
| 71 | Male | 40 | Always | To be seen | Quite expensive | Yes, I know | Penalty | V | V | - |
| 72 | Male | 25 | Sometimes | To be seen | Affordable | No, I do not know | - | - | - | V |
| 73 | Male | 25 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | V | V |
| 74 | Male | 30 | Sometimes | To be seen | Quite expensive | Yes, I know | Complete | V | - | V |
| 75 | Male | 35 | Always | To be seen | Affordable | Yes, I know | General | V | V | V |
| 76 | Male | 40 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 77 | Female | 26 | Always | To be seen | Affordable | Yes, I know | General | - | - | - |
| 78 | Male | 17 | Always | To be seen | Quite expensive | Yes, I know | General | V | - | - |
| 79 | Male | 30 | Always | To see the way | Affordable | Yes, I know | General | V | - | - |
| 80 | Male | 40 | Always | To be seen | Affordable | Yes, I know | Penalty | - | V | V |

| Respondents | Gender | Age | Question 1 | Question 2 | Question 3 | Question 4 | | Own Observation | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Front Light On | Rear Light On | Reflexes OK |
| 81 | Female | 50 | Always | To be seen | Affordable | Yes, I know | Complete | V | V | - |
| 82 | Female | 45 | Always | To be seen | Affordable | Yes, I know | Complete | V | - | - |
| 83 | Male | 40 | Always | To be seen | Affordable | Yes, I know | Penalty | V | V | V |
| 84 | Male | 20 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | V | V |
| 85 | Female | 25 | Sometimes | To be seen | Affordable | Yes, I know | General | V | - | - |
| 86 | Female | 30 | Never | To be seen | Too expensive | Yes, I know | General | - | - | V |
| 87 | Male | 35 | Sometimes | To be seen | Affordable | Yes, I know | General | - | V | |
| 88 | Male | 40 | Sometimes | Police Avoidance | Affordable | No, I do not know | - | V | V | V |
| 89 | Female | 40 | Sometimes | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 90 | Female | 30 | Sometimes | Police Avoidance | Affordable | Yes, I know | General | V | V | V |
| 91 | Male | 20 | Always | To be seen | Affordable | Yes, I know | General | V | V | - |
| 92 | Male | 20 | Sometimes | To see the way | Affordable | Yes, I know | General | V | - | - |
| 93 | Male | 40 | Always | To be seen | Affordable | Yes, I know | Penalty | - | V | V |
| 94 | Male | 25 | Always | Both | Affordable | Yes, I know | General | V | - | - |
| 95 | Female | 17 | Always | To be seen | Quite expensive | Yes, I know | General | V | - | V |
| 96 | Female | 35 | Always | To be seen | Affordable | Yes, I know | Complete | V | V | V |
| 97 | Female | 24 | Sometimes | To be seen | Quite expensive | No, I do not know | - | - | - | - |
| 98 | Female | 25 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 99 | Female | 28 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |
| 100 | Male | 35 | Always | To be seen | Affordable | Yes, I know | Penalty | V | - | - |

Appendix 39: Basic Data of Interviewees - Gender

| | Male | % | Female | % | Total |
|---|---|---|---|---|---|
| Lilla Fiskaregatan | 3 | 15% | 17 | 85% | 20 |
| Allhelgonakyrkan | 7 | 35% | 13 | 65% | 20 |
| Stora Södergatan | 11 | 55% | 9 | 45% | 20 |
| Trollebergsvagen | 13 | 65% | 7 | 35% | 20 |
| Tunavägen - Sångarevägen | 9 | 45% | 11 | 55% | 20 |
| All Locations | 43 | 43% | 57 | 57% | 100 |

Appendix 40: Basic Data of Interviewees - Age

| | Lilla Fiskaregatan | Allhelgona kyrkan | Stora Södergatan | Trollebergs vagen | Tunavägen - Sångarevägen | All Respondents | % |
|---|---|---|---|---|---|---|---|
| | Sum | Sum | Sum | Sum | Sum | | |
| Under 18 | 0 | 0 | 0 | 1 | 1 | 2 | 2% |
| 18-35 | 16 | 15 | 20 | 14 | 13 | 78 | 78% |
| Over 35 | 4 | 5 | 0 | 5 | 6 | 20 | 20% |
| Total | 20 | 20 | 20 | 20 | 20 | 100 | 100% |

Appendix 41: Frequency

| | All | % |
|---|---|---|
| Always | 46 | 46% |
| Sometimes | 41 | 41% |
| Never | 11 | 11% |
| It depends | 2 | 2% |
| TOTAL | 100 | 100% |

Appendix 42: Lights Function

| | All | % |
|---|---|---|
| To see the way | 6 | 6% |
| To be seen | 82 | 82% |
| No idea | 1 | 1% |
| Others | 11 | 11% |
| Total | 100 | 100% |

Appendix 43: Lights' Price

| | All | % |
|---|---|---|
| Affordable | 68 | 68% |
| Quite expensive | 21 | 21% |
| Too expensive | 11 | 11% |
| Total | 100 | 100% |

Appendix 44: Cyclists knowledge about regulation

| | All | % |
|---|---|---|
| General | 59 | 59% |
| Penalty | 20 | 20% |
| Lights and Reflectors | 2 | 2% |
| Complete | 6 | 6% |
| No, I do not know | 13 | 13% |
| Total | 100 | 100% |