



Consultancy report

**Older cyclists' views on their own possibilities to improve their safety**

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*"The safe system approach to road safety has renewed the focus on the need for an informed and engaged community to contribute to the adoption and application of effective road safety strategies."*

A. Smithson

## List of abbreviations

IOGT-NTO	IOGT-NTO is a Swedish temperance movement. It is the Swedish branch of IOGT International.
NTF	<i>Swedish:</i> Nationalföreningen för trafiksäkerhetens främjande <i>English:</i> National Society for Road Safety Swedish organization established in 1934.
MTB	Mountainbike A bicycle designed for off-road cycling.
PRO	<i>Swedish:</i> Pensionärernas riksorganisation <i>English:</i> The Swedish National Pensioners' Organisation An advocacy group in Sweden representing pensioners. It is the largest pensioners' organization in Sweden.
RPG	<i>Swedish:</i> Riksförbundet Pensionärs gemenskap An advocacy group in Sweden representing pensioners.
SCB	<i>Swedish:</i> Statistiska Centralbyrån <i>English:</i> Statistics Sweden SCB is responsible for official statistics in Sweden.
SKPF Pensionärerna	<i>Swedish:</i> Svenska Kommunalpensionärernas Förbund An advocacy group in Sweden representing pensioners.
SPF Seniorerna	<i>Swedish:</i> Sveriges Pensionärsförbund <i>English:</i> Swedish Pensioners' Association An advocacy group in Sweden representing pensioners.
STRADA	<i>English:</i> Swedish Traffic Accident Data Acquisition The official information system on injuries and accidents in road transport in Sweden.
TSFS	<i>Swedish:</i> Transportstyrelsens författningssamling <i>English:</i> The Swedish Transport Agency's collection of statutes The regulations issued by the Swedish Transport Agency are collected in the the Swedish Transport Agency's collection of statutes (TSFS).

## Summary

The project “Older cyclists’ views on their own possibilities to improve their safety” was conducted in 2020 by road safety consultant Magnus Andersson, Cajoma Consulting, Sweden.<sup>1</sup>

Of all categories of cyclists, older cyclists are most at risk of fatalities in the road traffic. During the period 2015-2019, 105 cyclists died in Sweden. Of these, 61 cyclists were over the age of 65, which corresponds to 58 per cent of the killed cyclists. During the period 2015-2019, 806 elderly people were injured cyclists seriously. Another 2,877 sustained moderate injuries while 3,507 were slightly injured.

The main purpose of the project was to find out what senior cyclists (in the age group 65 and above) think about their own possibilities to improve their safety. Another purpose was to investigate why some older cyclists adopt safety measures while others do not to the same extent.

The project was based on a literature review and 17 interviews with cyclists between 65 and 83 years of age. The project focused on three areas of central importance for the safety of older cyclists: helmet use, the bicycle and risk situations in traffic.

*1. Bicycle helmet use.* In its strategy for safer cycling, the Swedish Transport Administration has claimed that if everyone used a bicycle helmet, the number of cyclists killed could be reduced by 25 per cent.

*2. The bicycle.* The bicycle has several shortcomings that contribute to accidents and injuries among older cyclists. High steps make it increasingly difficult over the years to get on the bike. The start and stop moments create problems and often leads to accidents and injuries. Starts and stops are moments are particularly frequent in urban traffic and especially troublesome for older cyclists. The bike’s equipment, condition and maintenance are important factors for cyclists’ safety.

*3. Risk situations in the traffic.* Cyclists’ safety is to a large extent linked to the ability to assess and handle risk situations that appear in the traffic. For example, risks can appear in intersections. Another example is when cyclists end up in the “blind spot” in the immediate vicinity of buses and trucks. Alcohol consumption in connection with cycling has a negative influence on cyclists’ safety.

Five assumptions formed the starting point for this study. *First*, the number of older cyclists in Sweden is likely to increase in the foreseeable future. More and more people are expected to cycle after the age of 65. It is clear that without additional safety measures, the number of fatalities and injuries will increase. A significant part of the necessary safety improvements needs to come from them older cyclists themselves. *Secondly*, older cyclists have a great potential to improve their safety. However, this potential has not yet been systematically mapped. *Third*, older cyclists are not always aware of the simple measures they can take to increase their safety. Increased awareness of these measures can reduce the number of fatalities and injured cyclists. *Fourth*, it is important to start from more than one parameter in order to understand the pre-conditions for older cyclists to influence their safety. Bicycle helmet is an important safety parameter but it is also important to include parameters such as the bicycle, winter cycling, interaction with others road users and handling of risk various situations. *Fifth*, it is important to involve pensioners’ organizations in Sweden in the safety work for older cyclists. These organizations have many members and have a manifested interest in road safety issues.

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<sup>1</sup> This report was produced with financial support from Skyltfonden at the Swedish Transport Administration. Recommendations and conclusions are the author’s and do not necessarily correspond with the Swedish Transport Administration’s positions on the report’s subject matter.

The following conclusions can be drawn from the in-depth interviews with 17 older cyclists:

- Older cyclists, ie. In the age of 65 and above, is not a homogeneous group of cyclists. There are advanced cyclists as well as those who with greatest difficulty manage to cycle short distances.
- Some of the interviewed cyclists have had more accidents than the others. These accidents were often related to a certain degree of risk taking.
- Awareness of the risks connected with cycling seems to increase with increasing age. It expresses itself in the form of increased defensive driving style and reduced risk-taking.
- The bicycles that the interviewed cyclists use are, generally speaking, in a good or very good condition. According to the cyclists, the biggest problems with the bikes are too high saddle height (mainly a problem for women) and too high entry (mainly a problem for men). These problems increase the risk of accidents in connection with boarding and alighting. Excessive saddle height can lead to problems with balance and control in the very beginning of the bike ride as well as problems with control and balance during the ride.
- A minority of the 17 interviewed cyclists cycle in winter and not all of those who cycle winter time use studded tires.
- Cycling at intersections is considered to be complicated and dangerous. Several traffic situations were identified as dangerous. Examples are intersections with obscured visibility and intersections where spirit vehicles come obliquely from behind. Balance and control problems at intersections entail an increased risk of collisions.
- A clear majority of the interviewed cyclists stated that they personal experience of cycling after alcohol consumption. Among the cyclists there is a certain degree of acceptance of moderate drinking in connection with cycling.
- There is an interest in increased access to education and information about how elderly people's cycling could be made safer. Pensioners' organizations, including their local associations, are seen as possible platforms for education and information . Several persons stated that they would welcome TV programmes about seniors' cycling; "TV programmes are things that old people talk about."
- In previous studies about older cyclists, 75 years has been referred to as an age at which many older cyclists decide to stop cycling. However, most of the cyclists interviewed for this study declared that they plan to cycle significantly longer than to the age of 75. Notably, none of the interviewees cited increased physical vulnerability as a contributing factor for giving up cycling. It is the increased risk of accidents rather than the increased physical fragility that is perceived as most crucial factor for how long they think they will be able to continue to cycle.

The study showed that some older cyclists are better at adopting safety measures than others. In the case of bicycle helmet, it can be concluded that older exercise cyclists seem to have a higher helmet use than older everyday cyclists. The former cycle faster and longer distances than everyday cyclists which seems affect the use of helmets positively. Older everyday cyclists who do not wear a helmet explain it with the power of habit of not wearing helmet and the helmet affects the hairstyle in a negative way. The latter is a particularly common argument among women. Everyday cyclists who wear a helmet refer to the importance the experience of their own or close relatives' bicycle injuries. In terms of the bicycle's equipment and status, older exercise cyclists seem to be more likely than everyday cyclists to use bicycles in a very good condition. The interviews point unequivocally to the conclusion that older female cyclists have significant problems with control and balance. Women's problems are related to the fact that they have a significantly higher sitting position than men.

### *Recommendations*

The study results in 22 recommendations for older cyclists to help them protect themselves in the bicycle traffic.



#### Accident prevention measures:

1. To try to avoid cycling at intersections without traffic lights.
2. Not to blindly trust the priority to the right rule at intersections. *Never take a chance and never take anything for granted.*
3. To ensure that you as a cyclist have free surfaces around you when you start cycling, e.g. by an intersection. Problems with balance and control are common in the first meters of cycling.
4. To be aware of the danger of falling into the blind spot near larger vehicles, e.g. at intersections.
5. Try to lead the bicycle on passages that you perceive as unsafe.
6. Try to avoid cycling in roundabouts.
7. Plan the bicycle ride according to the safest road, even if it is not equal to the nearest road.
8. To improve visibility, use bicycle lights not only in the dark but also at dawn and dusk.
9. Always use winter tires in connection with winter cycling.
10. Try to use the bicycle bell in to improve the interaction with other road users, e.g. on cycle paths and at intersections.
11. To always use bicycles with lowest possible entry.
12. To lower the saddle height so that you as a cyclist *always* can have ground contact with your feet when sitting on the saddle.
13. When buying a bicycle, choose a type of bicycle of the right size which enables the saddle height to be lowered.
14. In the event of increasing balance problems, consider starting to use a bicycle with three wheels.

#### Injury prevention measures:

15. To always wear a bicycle helmet, even on shorter cycle distances. To facilitate helmet use it may be appropriate for the helmet to be close at hand before the start of the cycle.
16. Use other protective equipment that can reduce injuries to the knees, hips, elbows, hands etc.

#### General measures:

17. To always abstain from alcohol in connection with cycling.
18. To make a balance analysis, for example in connection with health checks.
19. To train your balance regularly.
20. Participate in courses on safe cycling if such training is offered.
21. To be aware that the risks of older cyclists (accident risks, vulnerability) increase markedly after approximately the age of 75 years.
22. To plan and prepare for ending cycling rather than letting an accident or serious incident become the reason why you stop cycling.

The study results in three overall conclusions. First, older cyclists have a significant potential to influence their own safety in the traffic by taking a number of simple measures. In this study 22 such measures were identified. Secondly, there is a growing need for training on safe cycling for older cyclists. Physical encounters can be interspersed with distance learning. Education can advantageously make use of experiences from the traffic safety educations provided by NTF and the three leading pensioners' organizations have annually arranged for the approximately 600 traffic representatives found within these organizations. Based on what emerged from the interviews that were conducted for this study, there seems to be a demand for education about increased safe cycling for people over 65 years of age. Theoretical knowledge should be mixed with practical training. Such an education could include the following elements:

1. The importance of cycling. Road safety and vulnerability.
2. Control and balance: entry, setting of the correct seat height, getting on and off the bicycle, start and stop, balance and control. Balance test and balance training.
3. Bicycle helmet and other protective equipment. Visibility. Winter cycling.
4. Management of risk situations: intersections, the cyclist and the priority to the right rule, the blind spot etc. Practical exercises.

5. Choosing the right bike: What to think about? Which bicycles are there to choose from? How long can/should you cycle? How training for older cyclists should be designed and implemented is a key question for the future.

Thirdly, in order to be able to promote the safety of older cyclists in the longer term, a systematic approach is needed to build knowledge about how older cyclists handle different aspects of their cycling: disembarkation, boarding, stopping, wobbling, swaying situations, falls from the bicycle and cycling at intersections. It is also important to map older cyclists' alcohol habits. The knowledge needs to increase about situations that the cyclists themselves consider to be most risky and situations that lead to most accidents and injuries. There is a need for increased knowledge about what discourages older cyclists from cycling and what can be done to get more older people to cycle longer without compromising their safety. Increased knowledge about elderly cyclists means that policy-makers are given a better basis for decision-making about what safety-enhancing measures should be prioritized.

## Preface

All aspects of this study have been carried out by road safety consultant Magnus Andersson, Cajoma Consulting.

The report has been produced with financial support from Skyltfonden at the Swedish Transport Administration. Conclusions and recommendations in the report are author's and do not correspond with the Swedish Transport Administration's positions, conclusions and working methods within the report's subject matter area.

Many thanks to the Skyltfonden at the Swedish Transport Administration's and to all those persons who were interviewed for this project. Thanks to NTF Jönköping for help with arranging contacts to cyclists in Växjö and Gothenburg. Thanks to Tomas Fredlund, The Swedish Transport Agency, for statistical information from Strada on bicyclists accidents. Special thanks to Krister Spolander and professor emeritus Evert Vedung for valuable views regarding content and structure. For the sake of clarity, it should be added that only it is only me who is responsible for the report content and form. The study was completed in January 2021.

Uppsala in January, 2021  
Magnus Andersson

# 1. Introduction

Since 1960, the number of cyclists killed in the road traffic in Sweden decreased from 171 to 17 in 2019. In terms of severely injured cyclists, a downward trend has been noted since the mid-1980s. This trend can mainly be explained by the separation between cyclists and motor vehicles as well as speed-reducing measures in urban areas.<sup>2</sup>

Older cyclists are most at risk of fatalities in the road traffic. Older cyclists<sup>3</sup> are a more vulnerable group in terms of the risk of serious injury in bicycle accidents. In addition, older people account for 50 per cent of all deaths related to bicycle accidents. Today, people aged 65 or older represent 20 per cent of the total population in Sweden.<sup>4</sup>

Five assumptions are the starting point for this project. *First*, the number of older cyclists will increase within the foreseeable future. More and more people are expected to cycle after the age of 65. It is clear that without further safety measures, the number of fatalities and injuries may increase. A significant part of the necessary safety improvements needs to come from the elderly themselves. *Second*, older cyclists have a great potential to improve their safety on their own safety situation. This potential has not yet been systematically mapped. *Third*, older cyclists are not always aware of the simple steps they can take to increase their traffic safety. Increased awareness of these measures can help reduce the number of fatalities and injured cyclists. *Fourth*, it is important to start from more than one parameter in order to understand the preconditions for how older cyclists can influence their road safety. Bicycle helmet is an important parameter but it is also important to include parameters such as the status of the bicycle, winter cycling, the interaction with others road users and handling of risk situations such as cycling at intersections. *Fifth*, it is important to involve pensioners' organizations in the safety work for older cyclists. Within these organizations there is a manifested interest in traffic safety issues.

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<sup>2</sup> Traffic Analysis, 2018; Swedish Transport Administration, 2018.

<sup>3</sup> According to the World Health Organization, older people can be defined as 65 years of age or older. This report uses this definition.

<sup>4</sup> According to Statistics Sweden (2016), Sweden's population will increase by about one million inhabitants the next ten years. Of these inhabitants, approximately 300,000, 65 years or older, which corresponds to an increase of 16 per cent. That figure is expected to rise to around 25 per cent by 2060. At the age group of 65-79 compared to the group of 80-, there is a clear difference in increase since the year 2000. While the age group 65-79 has had a increase of about 500,000 people since the year 2000, people 80 years or older have been stable at the same level. Over the next 15 years, a sharp increase in the age group 80 years or older is expected (an increase of 300,000 persons) together with a stagnation in the number of persons in the age group 65-79 (Collander, 2016).

## 2. Purpose, issues and boundaries

The main purpose of the project “Older cyclists’ views on their own possibilities to improve their safety” is to find out what older cyclists (65-) think about their own possibilities to improve their own safety in connection with cycling. Another purpose is to investigate why some older cyclists adopt safety measures while others do not to the same extent. The project has three focus areas: bicycle helmet use, status of the bicycle and the cyclist’s capacity to handle risk situations in the traffic.

1. *Bicycle helmet use.* The use of a bicycle helmet is an effective measure against serious head injuries. If all cyclists in Sweden would wear a bicycle helmet, the number of cyclists killed would decrease by 25 per cent. Information and training initiatives on bicycle helmets have been successfully aimed at pensioners organizations in different places in Sweden.
2. *Bicycle equipment and status.* The bicycle has several shortcomings from senior cyclists’ perspective that contribute to accidents and injuries. High steps make it difficult over the years to get on and off the bike. It often leads to accidents and injuries. The starting and stopping moments, that are so frequent in the urban traffic, are particularly troublesome for older cyclists. The bicycle’s equipment, condition and maintenance are crucial for the safety. The use of studded tires mean safer cycling in winter.
3. *Ability to manage risk situations.* Cyclists’ safety is to a large extent linked to the ability to handle potential risk situations in the traffic. Such situations can, for example, be about cycling at intersections. Another example is when cyclists end up in the “blind spot” near heavy vehicles such as buses, trucks etc. Alcohol consumption in connection with cycling has a negative effect on safety.

Key issues addressed in the study are:

### Bicycle helmet use (Chapter 5):

What can older cyclists themselves do to increase their bicycle helmet use? What can society and pensioners’ organizations do to support this? What prevents older cyclists from increasing their helmet use?

### Bicycle equipment and status (Chapter 6):

What can older cyclists themselves do to increase their cyclists’ safety regarding equipment and maintenance? What can society and pensioners’ organizations do to support this? What hinders older cyclists from taking measures to improve the safety performance of their bicycles?

### Management of risk situations (Chapter 7):

What are the most serious risk situations for the elderly in the bicycle traffic? What can older cyclists themselves do in order to avoid accidents in such risk situations? What can society and pensioners’ organizations do to support cyclists in this? What prevents older cyclists from avoiding risk situations?

In addition, the study includes a chapter on how the interviewed cyclists view their future cycling. (chapter 8). Another chapter deals with cyclists’ views on the need for education for older cyclists (chapter 9).

The study is limited to older cyclists’ behavior and the cyclists’ and their interaction with their bicycle. The study thus does not deal with the design of streets and roads, physical measures in the traffic environment or traffic safety rules for cyclists.

### 3. Methods

Two methods have been used to conduct this study: interviews and literature review. The most important source material is obtained through individual interviews. In-depth interviews were conducted with 17 elderly cyclists resident in four municipalities in Sweden: Gothenburg, Halmstad, Uppsala and Växjö.<sup>5</sup> Such depth interviews are assumed to generate new information about safety measures relevant for policy reform efforts aimed at increasing the road safety for older cyclists. In addition, six interviews were conducted with people who were judged to possess expert knowledge about older cyclists' road safety. A list of all the people interviewed for this project can be found in Appendix 1. Appendix 2 contains a list of the questions that were used in the interviews. The interviews were made by telephone. The telephone interviews were recorded using a tape recorder. The interviews were transcribed verbatim and then sent back to the interviewees for approval. The informants had an opportunity to correct and supplement each interview via e-mail.

The study is based on a general analysis of written documents, primarily research reports and policy documents. These sources have been supplemented with newspaper articles, consultant reports and information from various websites.

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<sup>5</sup> NTF Jönköping assisted with proposals for cyclists to interview in Växjö and Gothenburg. The cyclists who were interviewed in Uppsala and Halmstad were selected by the author of this report.

## 4. Literature overview

The bicycle has several properties which means that older cyclists have a significantly higher risk of accidents and injuries than other cyclists. First, the bicycle is an unstable vehicle. It requires a continuous balancing for the cyclist to be able to keep the balance. To balance, counteract tendencies towards instability and cover variations in the quality and friction of the surface requires a “psychomotoric skill” of the cyclist. This ability gradually deteriorates with aging. Secondly, the bicycle is an unprotected vehicle. For third, older cyclists have significantly higher risk of injury as a result of age-related reduced tolerance against the physical violence to which they are subjected in the event of a rollover or collision.<sup>6</sup>

In this chapter, the result of a literature review on the safety of older cyclists is presented. The overview has been supplemented with information from interviews with experts in the field of road safety for the elderly. The chapter initially deals with the elderly cyclists’ specific conditions. It is followed by the following topics: bicycle accidents among the elderly, the use of bicycle helmets and other protective equipment, bicycle equipment and maintenance, and special risk situations in the bicycle traffic. Finally, a model for safe cycling developed by VTI’s research programme on safe cycling is presented.

### Specific conditions for older cyclists

There are more “younger old” than “older old” pensioners who use the bicycle as a means of transport. According to Rosenkvist et al. (2013) the bicycle is used by 47 per cent of people aged 65-79 years, and 21 per cent of persons in the age group 80 years or older. Many older people stop cycling around the age of 75. It is related to deteriorating health, perceived lack of consideration from other road users and the perception that the traffic has become too dangerous and complex. Some older cyclists exhibit a compensatory behaviour to reduce the risk. Examples are trends to avoid cycling in rush hour traffic, cycling in the dark and cycling on slippery roads (Englund et al., 1998).<sup>7</sup>

Older cyclists usually cycle alone and at times when other cyclists (e.g. commuter cyclists) usually do not cycle. Thus, few older cyclists benefit from the safety advantage of “safety in numbers”. This phenomenon means that when more cyclists cycle on the same surface, it leads to a reduced risk for each individual cyclist.<sup>8</sup>

Thulin and Niska’s (2009) risk calculation for different age groups in bicycle traffic showed that age the group 7–14 years has a twice as high risk of injury and the age group 75–84 years a three times as high risk of injury compared to other age groups.

Older cyclists have a number of disabilities that make them the most vulnerable cyclist group.

*Fragility:* The elderly have an increased fragility against physical violence, which means that when an accident occurs, they are more vulnerable to severe and fatal injuries. According to Ulf Björnstig,

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<sup>6</sup> Communication with bicycle and traffic safety consultant Krister Spolander, 2020.

<sup>7</sup> A study of older cyclists showed that most accidents in this group occur during the summer. More older female cyclists are injured more often during the period May-September compared to male older cyclists. The latter’s accidents are more widespread throughout the year, indicating that more older men than women cycle during the winter (Rosenkvist et al., 2013).

<sup>8</sup> Two mechanisms are considered to explain why the risk per cyclist decreases as the number of cyclists increases: (1) Car drivers pay more attention to cyclists and (2) the interaction between road users may be of higher quality (Brüde and Larsson, 1993; Ekman, 1996 and Jacobsen, 2003).

professor of surgery, the degree of injury is increasing from the age of 75. A special problem is femoral neck fractures, which is related increased fragility of the skeleton.<sup>9</sup> According to bicycle and traffic safety consultant Krister Spolander, at the age of 65 a person is 3.5 times more fragile than at 20 years of age. At the age of 80, it is about factor ten. The need of protective and safety measures for older cyclists increase as the fragility increases.<sup>10</sup>

*Balance problems.* Keeping the course for a cyclist means steering in a certain direction and at the same time stabilizing the vehicle, ie. keeping the balance. The elderly's ability to keep the balance is deteriorating. At the age of 70, 75, and the 80 the balance ability is analyzed at some health care controls in Sweden.<sup>11</sup> Elderly cyclists' balance problems manifest themselves, among other things, in connection with boarding and alighting, at bends and at cycling at low speed. Many single accidents occur at lower speeds. The cyclist may have lost the balance on an uphill slope and fell over. Such accidents are most common among the elderly cyclists (Niska et al., 2013).<sup>12</sup>

*Impaired motor ability.* Age-related changes lead to decreased agility and muscle strength which lowers motoric ability. Cyclists need to be able to turn their heads to see if it is safe to cross a street. Older people may have trouble turning their heads to be able to see side which weakens their ability to observe in traffic (Englund et al., 1998).

*Visual impairment.* Human eyesight decreases with increasing age. Older cyclists may have a hard time seeing pits and stones in the roadway which can lead to accidents.<sup>13</sup> Increasing age often leads to deterioration of peripheral vision. Peripheral vision is used to detect objects in motion and events and for the guidance of central vision (Englund et al., 1998).

*Hearing loss.* Hearing loss is very common among the elderly. More than every third person between the age of 65 and 74 have hearing loss and nearly 60 per cent of all persons over 85 years.<sup>14</sup>

*Impaired cognitive functions.* Limitations in the ability to pay attention, as well as the ability to make quick decisions in pressured situations, can lead to accidents for older cyclists, especially in crossings.

“With increasing age, it becomes more difficult both to divide the attention between several objects and to select the important information among the abundance and ignore the rest. These difficulties become clearer the more complicated or pressing the situation is. Although no individual functional reduction provides a satisfactory explanation for the fact that accidents of the elderly occur at intersections can an intersection constitutes a situation where the various risk factors accumulate, which in turn leads to one increased accident risk.”<sup>15</sup>

According to bicycle and traffic safety consultant Krister Spolander, the “perceptual simultaneous capacity” can be impaired for some older cyclists. This means being able to keep track of the road surface and ambient traffic so that the cyclist can adapt his speed and location to the risks generated by the surface and traffic.<sup>16</sup>

*Reduced reaction capacity.* Aging means that the reaction capacity is reduced. The more complicated choice situation, the longer the reaction time (Englund et al., 1998). Cycling through an

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<sup>9</sup> Interview with Ulf Björnstig, Professor of Surgery, 2020. “Femoral neck fracture is a fairly serious injury. It is also associated with increased fragility in the skeleton. For women, it occurs after menopause, at the age of 55 approximately. For men, it comes a little later.”

<sup>10</sup> Interview with Krister Spolander, bicycle and traffic safety consultant, 2019.

<sup>11</sup> Interview with Ulf Björnstig, professor of surgery, 2020.

<sup>12</sup> Problems keeping the course are common at lower speeds. If a cyclist fails to keep his course, it may involve a conflict with other road users.

<sup>13</sup> Interview with Mari-Anne Andersson, SKPF Pensionärerna, 2020.

<sup>14</sup> Source: [www.horselslingan.se](http://www.horselslingan.se)

<sup>15</sup> Englund et al., 1998: 341.

<sup>16</sup> Consultation with bicycle and traffic safety consultant Krister Spolander, 2020.



intersection as you get older means that you have a more limited time at your disposal to make decisive decisions.

### Bicycle accidents among older cyclists

This section reports the number of older cyclists who were killed and injured in Sweden during the period 2015-2019. The information is based on statistics retrieved from the Strada<sup>17</sup> database in Sweden.

#### Killed cyclists, age group 65-

During the period 2015-2019, 105 cyclists were killed in Sweden. Of these, 61 cyclists were more than 65 years old (Table 4.1). This corresponds to 58 per cent of all cyclists killed. Thus, more than every second cyclist who were killed in traffic was an elderly cyclist. The number of older cyclists who have annually died in road traffic during the five-year period varied between eight and sixteen.

**Table 4.1. Killed cyclists in Sweden 2015-2019.** *Source:* Strada statistics report.

Year	Number of dead	of which cyclists 65-
2015	17	8
2016	22	11
2017	26	16
2018	23	14
2019	17	12
Total	105	61

Table 4.2 shows that there were significantly more older male cyclists than older females who died during the period 2015-2019. Most male cyclists have died after the age of 75. Male cyclists over 75 is thus the most vulnerable group of cyclists.

**Table 4.2. Killed cyclists, 65-, by sex and age. Sweden 2015-2019.**

*Source:* Strada statistics report.

Age group	Man	Woman
65-74	23	4
75-	28	6
Total	51	10

Approximately as many older cyclists died in collisions with motor vehicles as in single accidents in the period 2015-2019 (Table 4.3).

**Table 4.3. Killed cyclists, 65-, by type of accident. Sweden 2015-2019.** *Source:* Strada statistics report.

Type of accident	Number of dead
Collision with motor vehicle	31
Single accident	29
Collision with another cyclist	1
Total	61

<sup>17</sup> Swedish Traffic Accident Data Acquisition. The official information system on injuries and accidents in road transport in Sweden.

During the period 2015-2019, most older cyclists died on streets and roads as well as at intersections. In addition, seven cyclists died on the pedestrian and cycle path/road (Table 4.4).

**Table 4.4. Killed cyclists, 65-, by type of street. Sweden 2015-2019.**

*Source:* Strada statistics report.

Place	Number of dead
Street or road section	33
Street or road intersection	16
Roundabout	1
Traffic place for interchange	1
Pedestrian and bicycle path	7
Pedestrian path/sidewalk	1
Other places	2
Total	61

Table 4.5 shows that most older cyclists have died on the state road network, followed by the municipal road network.

**Table 4.5. Killed cyclists, 65-, according to road operator.**

**Sweden 2015-2019.** *Source:* Strada statistics report.

Type of roads	Number of dead
State roads	20
Municipal	36
Individual	3
Unknown	2
Total	61

#### Injured cyclists, age group 65-

During the period 2015-2019, 806 older cyclists were seriously injured. Another 2,877 sustained moderate injuries while 3,507 was slightly damaged (Table 4.6).

**Table 4.6. Injured elderly cyclists, 65-, Sweden 2015-2019.**

*Source:* Strada statistics report.

Year	Seriously injured (ISS 9-)	Moderately damaged (ISS 4-8)	Mildly injured (ISS 1-3)
2015	148	562	634
2016	187	585	720
2017	166	572	685
2018	129	620	790
2019	176	528	685
Total	806	2,877	3,507

### *Collander's study on elderly cyclists' accidents*

Collander (2016)<sup>18</sup> studied accidents among older cyclists and concluded that the single accident is the most frequent type of accident in this group.<sup>19</sup> Most accidents among older cyclists have occurred during daytime between May and August. Collander analyzed the number of accidents involved older cyclists per 100,000 inhabitants, depending on age group and gender, by type of accident. In the age group 85-, men had almost six times more accidents compared to women of the same age. Men in the age group 80-84 were often affected by collisions with motor vehicles, 70 per cent more often than cyclists in the age group 65-69. In percentage terms, more bicycle accidents involving the elderly occurred at roads, intersections and traffic places.

Collander found a significant correlation between gender and accident site. Older male cyclists tend to injure themselves more often at roads, intersections and roundabouts compared to older people female cyclists, which may be due to greater risk taking in older men. It can also be due to different movement patterns in the traffic. For example, women often lead the bike over intersections. It can also be due to that older women opt out of the bicycle as a means of transport. Older male cyclists collide more often with motor vehicles compared to older women. In addition, in all types of accidents, a higher accident rate can be seen among "older old" male cyclists. Most accidents per 100,000 inhabitants occur in the age group 80-84, both in single accidents and in collisions with a motor vehicle. Previous studies have shown similar results: older male cyclists are exposed bicycle accidents at older ages to a greater extent than female cyclists (Collander, 2016; Scheiman et al., 2010).

### **Bicycle helmet and other protective equipment**

In its national strategy for safer cycling in Sweden, the Swedish Transport Administration has claimed that if everyone used a bicycle helmet, the number of fatalities among cyclists would decrease by 25 per cent. Bicycle helmet can reduce cyclists' head injuries by 50 per cent.<sup>20</sup> Head injuries are common among those who die or are injured in road accidents, something which could be alleviated, or completely avoided, if these cyclists had worn helmets.<sup>21</sup> The national Swedish goal for the year 2020 was to achieve a bicycle helmet use of 70 per cent. In 2019, 44 per cent of cyclists wore a helmet (Swedish Transport Administration, 2020). To increase the use of helmets among older cyclists, information efforts need to increase.

Information and training initiatives on cycling and bicycle helmets have been successfully targeted pensioner organizations in different places in Sweden. An example is NTF FyrBoDal who has trained all road safety representatives in the existing pensioners' organizations in the district. The idea is that so-called road traffic safety representatives shall convey the knowledge at the monthly meetings that are arranged in different local associations. In Malmö, there are pensioners' associations, such as PRO Husie, which have adopted a policy in accordance with which is a requirement to wear a helmet on all cycling trips. "All pensioners wear helmets. Without a helmet they are not allowed to ride a bike" (Andersson and Vedung, 2014).

A review of international articles on policy instruments to increase the use of bicycle helmets in four continents, mainly North America and Australia, showed that legislation combined with training and information initiatives are a more effective way of promoting increased bicycle helmet use than using only one instrument. The combination of three instruments – regulation, information and financial incentives – has the greatest potential to increase the use of bicycle helmets (Andersson and Vedung, 2014).

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<sup>18</sup> Collander, 2016.

<sup>19</sup> Thulin and Niska (2009) found that older cyclists are most at risk of being involved in single accidents at intersections and bicycle crossings compared to other age groups.

<sup>20</sup> Elvik, 2013.

<sup>21</sup> Nolen, 2004.

Protective equipment for cyclists' arms and legs, including the hips, has a maximum potential reduce the number of serious injuries by 30 per cent according to the Swedish Transport Administration (2014). Also other type of protective equipment such as padded cycling pants and special cycling jackets with protection for shoulders and elbows protect cyclists from injury. Built-in hip protection can reduce the risk of femoral neck fracture by 50 per cent.<sup>22</sup>

Reflective vests and reflectors increase cyclists' visibility. According to Niska and Eriksson (2013), approximately 13 per cent of collisions with cyclists occurred in the dark. Car drivers find it easiest to spot cyclists' reflective vest in combination with reflective band around the knee and ankle. In one study, cyclists who were completely black-clad without reflective material were not visible at all by older drivers. Cyclists with reflective vests was detected in about 30 per cent of the cases by the older drivers and in 70 per cent of the younger ones. In Sweden there are no requirements for reflective clothing when cycling in the dark, while there are in some European countries.<sup>23</sup>

#### Cycling and alcohol consumption

Alcohol consumption in connection with cycling is a well-known risk factor and a contributing factor to accidents, especially fatal accidents. A Dutch study examined the risk of having an accident as a cyclist, pedestrians and motorists at different degrees of alcohol exposure. The study showed the following results:

- Up to 2 per mille: the risk is roughly the same for cyclists as for car drivers. A crucial difference is that a drunk driver injures other road users while a drunk cyclist usually only harms him/herself.
- Over 2 per mille: the risk for cyclists is higher than for motorists.
- Pedestrians are at a higher relative risk than both motorists and cyclists.<sup>24</sup>

Research has shown that cyclists' gross motor skills at a blood alcohol concentration of 0.8 per mille are clear deteriorated.<sup>25</sup> Bylund and Björnstig (2004) found that about 40 per cent of the cyclists who received head injuries were under the influence of alcohol at the time of the accident. Of the 236 cyclists who died during the period 2006-2015, 27 cyclists had alcohol in their blood. For 53 cyclists, the incidence of alcohol was unknown. The average concentration among those who have been affected was 1.78 per mille (Wallén Warner et al., 2017).

In Sweden, there is no limit to the alcohol impact that is allowed for cyclists. Alcohol impact on cyclists is not routinely checked, which means that knowledge of cyclists' impact is limited. Alcohol exposure can be a bigger problem than the statistics point out because information about the influence of alcohol is often missing in the accident texts that are based on the cyclists' own stories about the accident circumstances (Niska et al., 2013).

Since cycling under the influence of alcohol is generally not considered a serious problem, there is one low acceptance for the introduction of a blood alcohol limit for cycling. Cyclists tend to choose the bicycle in situations under the influence of alcohol because it is considered to be a better alternative than the car. Possible measures to reduce the incidence of cycling under the influence of alcohol could be the introduction of an alcohol limit in the blood, improved public transport and targeted information initiatives.<sup>26</sup>

The problem of alcohol-related accidents among older cyclists should be seen in the light of the fact that alcohol consumption among older people (65-84) in Sweden increased by about 30 per cent

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<sup>22</sup> Interview with Ulf Björnstig, professor of surgery, 2020.

<sup>23</sup> Reflective vests are required for cycling at night or in poor visibility in France, Hungary, Italy, Lithuania, Malta, and Slovakia.

<sup>24</sup> Niska et al., 2013.

<sup>25</sup> Hartung et al., 2015.

<sup>26</sup> Wallén Warner et al. (2017) argues that information should be preferred among these measures.

during the period 2004-2018. Among other age groups, alcohol consumption decreased during the same period.<sup>27</sup>

Maria Krafft, traffic safety director at the Swedish Transport Administration, emphasizes the risks of cycling drunk. She's calling for a dialogue about alcohol linked to cycling and not just to driving. However, that dialogue has so far not been particularly active.

“It is reasonable to make such a reasoning when society as a whole is about to change, that more people should walk, cycle and take public transport. To get an attractive transport system for other reasons, this issue also needs to be made visible and it has not been so far.”<sup>28</sup>

#### Cyclists' potential to take their own measures to protect themselves

Table 4.9 shows potentials for measures that cyclists themselves can take to protect themselves from perish or be injured. The bicycle helmet has the single greatest potential to save cyclists' lives (25 per cent). The safety benefits of different measures differ between different age groups. For example, stabilization of the cycle or a lower step has the greatest potential to reduce the number of serious injuries among older cyclists.

**Table 4.9. Cyclists' potential to protect themselves with their own measures.**

Source: Niska and Eriksson, 2013: 36.

Measure	Potential to reduce the number of seriously injured cyclists	Potential to reduce the number of killed cyclists
Safe use:		
Use of bicycle helmet	10%	25%
Protective jacket and trousers	30%	
Sober cycling	5%	10-15%
Right speed	5%	
Safe bikes		
Studded tires	15-20%	
ABS brakes etc.	5%	
Lower entry (safe on and off boarding)	5%	
Bicycle inspection	5%	
Bicycle lighting and reflectors for visibility	0-5%	5%

#### **The bicycle: its equipment and maintenance**

The bicycle's equipment affects the safety of cyclists. This primarily applies to brakes, tires and devices to transport goods more safely by bicycle. Winter time provides studded tires, also called winter tires, on a bicycle a better grip on ice and snow than ordinary tires (Niska et al., 2013). The bicycle has several properties that are problematic from a safety perspective. Cycling unstable construction makes the bike sensitive to the quality of the surface. Various forms of disturbance, for example in the form of weighing for another road user, can have a negative effect on the balance. Furthermore, the bike is missing protection that can absorb collision forces. Virtually all accidents end with the cyclist hitting the ground (Spolander and Unge, 2013).

<sup>27</sup> Guttormsson, 2019 and interview with Per Leimar, IOGT-NTO, 2020.

<sup>28</sup> Interview with Maria Krafft, traffic safety director, Swedish Transport Administration, 2020.

The design of a bicycle varies with the type of bicycle and can affect both the risk of encountering an accident and the consequence of a possible accident. In 16 per cent of single accidents, causes have to do with the bicycle or the cyclist's interaction with the bicycle has been the main underlying cause (Niska and Eriksson, 2013).

#### The bicycle and its equipment

Well-functioning brakes are a prerequisite for being able to avoid a critical accident situation. According to applicable legal requirements, a bicycle must be able to apply a braking force corresponding to a deceleration of 3 m/s<sup>2</sup>.<sup>29</sup> When the brakes have stopped working it may be due to "deficiencies in maintenance or construction of the bicycle and its components." This category also includes accidents due to the chain broke or jumped off, a wheel was lost or got a break on the front fork, etc. In total, this category contributes to 5 per cent of single accidents (Niska and Eriksson, 2013).

The grip of the tires is of great importance for the cyclist's ability to handle the bike: to be able to brake, change direction, make a quick evasive maneuver and when cornering. An analysis of injured cyclists registered in Strada (Thulin and Niska, 2009), showed that in 18 per cent of all injuries have slipped, or impaired grip, has been a contributing factor. It is thus the most common individual explanation for cyclists' single accidents (Niska and Eriksson, 2013). Studded tires on bicycles have a significant potential to reduce the number of seriously injured cyclists (eg. Niska, 2007; Niska, 2013). According to current traffic legislation in Sweden, a bicycle must have lighting and reflectors when traveling in the dark. At the front there shall be a headlamp or lamp with white or yellow light and at the rear a lamp with red light. The bicycle lights must be clearly visible at a distance of 300 meters. In addition, the bike must have a red reflector at the back, white reflex at the front and white or orange-yellow reflex at the side.

#### Bicycle maintenance

Bicycle maintenance is a central issue for cyclists' safety. Many bicycles are stored outdoors, some year round. The bike's vital components such as brakes and driveline are unprotected from weather and wind. Fasteners for handlebars and saddle, crank parts, pedals and gears are exposed to stresses that can jeopardize function and safety over time (Spolander, 2007). Regular service and control of the bicycle reduces the risk of its safety performance being reduced over time.

#### Balance and control

The bicycle is an unstable vehicle. It is required that the cyclist has the ability to keep his balance to avoid a fall. Bicycle stability is achieved through an interaction between the vehicle and its driver. It is mainly through steering and small adjustments of the position on the knees, that a cyclist keeps the balance during his ride (Schwab and Meijaard, 2013). The lower the speed, the more the cyclist needs to work with the handlebars and his center of gravity to keep the balance. That it is more difficult to keep the balance at low speeds reflects in the accident descriptions in Strada, where a contributing cause in one per cent of the single accidents is stated to be that "the energy has run out" in an uphill and the cyclist therefore lost his balance and fell over (Niska and Eriksson, 2013). Many of the elderly's serious bicycle accidents can be avoided by facilitating boarding and alighting and stabilizing the bike at lower speeds.

#### Boarding and disembarking

Many accidents occur when the cyclist has to get off or on the bike. The cyclist then has, for example got stuck with his leg, lost his balance and fell so badly that he had to go to the hospital. About 6 per cent of seriously injured in single accidents have had such an accident (Niska and Eriksson, 2013; Niska et al., 2013). If one look at all the injured cyclists, three out of four are 50 years or older in this type of accident.

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<sup>29</sup> The Swedish Transport Agency's regulations, TSFS 2010: 144.

In a study about injured cyclists, 65 years and older, who were cared for at Umeå University Hospital, 20 per cent were injured when boarding or disembarking the bicycle (Scheiman et al., 2010). These cases often resulted in thigh or hip fractures and in total they accounted for almost a third of the total number of care days in the studied group. When getting on and off the bike, the height of the bike's entry is important, above all for the older cyclists (Björnstig and Näslund, 1984). Due to that, have special bikes specifically developed for the elderly have been discussed in various contexts (eg. Spolander, 2007).<sup>30</sup> Technical University of Delft, the Netherlands, has made attempts to develop and test a number of different bicycle models specially adapted for the elderly. Among other things, they had lower steps, different placement of the pedals and the saddle, which means that it is easier to put your whole feet down on the ground without need to get off the saddle. Three-wheeled bicycles are also available for the elderly or disabled. They are lighter to keep the balance at lower speeds, but instead stability problems appear when cornering at higher speeds. Observations of older cyclists at three intersections in Uppsala, Sweden showed that many of them cycled wobbly at low speeds and that their sitting position was so high that cyclists could not make ground contact with feet without jumping off the saddle. Each stop at an intersection meant an exit and each start meant an ascent. Of the 150 older women observed, 70 per cent had too high a saddle height (Andersson, 2017).

In addition to the fact that the seat height on the bike affects the ability to lower the whole foot to the ground. The height also affects the cyclist's ability to get an overview of the traffic situation and to be seen by others road users. The seat height also has some significance for the impact energy such as the cyclist's body and head are exposed when overturning and thus affects the injuries that a cyclist incurs. In some cases, there is a tendency for a higher seat height on the bike to give a greater impact force in the head. There is a need for safer bicycles, including boarding and alighting. Older cyclists should be stimulated to use a women's bicycle with a low step and have a sitting position (saddle height) closer the ground. It reduces both the risk of accident and the risk of injury because the outcome of an accident depends on impact energies and head exposure. The report "Better bicycles – an analysis of older cyclists' needs and wishes" (Spolander, 2007) stated that today's bicycle has several shortcomings from an elderly perspective that contribute to accidents and injuries. The starting and stopping moments, which are frequent in urban traffic, are particularly difficult for older cyclists because (1) the driving position is uncomfortable with strain on the hands, arms and buttocks and (2) the high entry makes it increasingly difficult over the years to get on the bike.

These shortcomings contribute to difficulties in maintaining good control and balance during cycling. According to Spolander these problems are maneuvering problems. The report showed that older cyclists have 2-3 times greater relative risk of serious injuries compared to elderly pedestrians and road users. Just over a quarter of all care days that injured elderly cyclists need to use can be related to on and off disembarkation. Common denominators for both comfort and safety issues are the seat height, driving position and entry height. The high driving position has two negative safety effects: drop height and head exposure when overturning. If the sitting position is lowered, the fall height is reduced. Lowered seating position for the cyclist means better control, maneuverability and balance. When you as a cyclist in in connection with a stop can remain on the saddle and put your feet in the ground improved maneuverability, especially at low speeds. According to Spolander, bicycles are generally too heavy to handle with respect to comfort and safety. The older you get, the bigger this problem becomes. There are big opportunities to develop more comfortable and safer bicycles. It is very important to come to terms with seat height, driving position and entry.

According to Spolander, the bicycle retains its basic geometry as it has had since the late 19th century. The driving position is the same with load on the arms, hands and buttocks. The fall height is high and the head is exposed in collisions and rollovers. The disadvantages of the current bicycle design become particularly clear when viewed from the safety perspective of older cyclists:

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<sup>30</sup> A so-called Crank Forward cycle has been developed by the American company Rans. The bike has a low saddle, the legs are placed further forward compared to a normal bike and the riding position is upright. See Spolander, 2007: 34.

“Of the cyclists who are killed in traffic accidents, more than 40 per cent are 65 years or older. It (...) can probably explained by fall height and head exposure in combination with the elderly’s fragility for the physical violence which thereby arises in bicycle accidents. Also from the point of view of comfort is the driving position and driving stability more difficult for the elderly. The general age changes include reduced agility and muscle strength, prolonged reaction times and more uncertain balance (large individual variations). This makes it more difficult to maneuver and balance a conventional bicycle. And more inconvenient. The age changes should reduce the tolerance with the bicycle’s deficient ergonomics and comfort. All of this helps to limit older people’s use of the bike and makes them stop cycling unnecessarily early.”<sup>31</sup>

### **Special risk environments in the bicycle traffic**

A large proportion of all collisions between cyclists and motor vehicles occurs at intersections. Here different types of road users meet each other, both protected and unprotected, with great complexity as a result (Englund et al., 1998). About every third cyclist who has died in a collision with a motor vehicle has been killed in a collision with a heavy vehicle ie. truck or bus. Right-turning trucks are a particular problem when it comes to cyclists’ safety and has, for example, been studied in detail by the Accident Investigation Board for Road Traffic Accidents in Denmark. According to the Commission, there are opportunities to reduce the risk of this type of accident, among other things through information to cyclists (HVV, 2006). In this context, it should be pointed out that there may be several contributing events that cause an accident to occur. For example, a cyclist may have wavered, for example due to balance problems and/or slippery ground and then been hit in an traffic intersection.

A large proportion of collisions between cyclists and motor vehicles occur in mixed traffic on streets and road sections. The most serious accidents occur on streets and roads where the permitted speed limit is higher than 40 km/h. In relation to the limited number of cyclists who cycle in roundabouts, the frequency of collisions between cyclists and motor vehicles in roundabouts are very high. According to Niska et al. (2013) such accidents account for 7 per cent of all collisions between cyclists and motor vehicles.

### **A model for safe cycling**

The report “A model for safe cycling” (Wallen Warner et al., 2018) summarized the results and proposed measures from eight projects previously implemented under VTI’s research program about safe cycling. The model presents a list of proposed measures that are in accordance with Haddon’s matrix (1972) is aimed at the cyclist, the bicycle and the traffic environment. The model indicates where in the course of the accident – conditions, pre-crash, crash and post-crash – which measures should be put in place and which actors are appropriate to initiate and implement the respective action proposals. *Conditions* refer to factors such as determines whether there are conditions for so-called “normal” cycling. It’s about rules that talk about how the cyclist should behave, how the bicycle should be shaped and used and guidelines for how the traffic environment otherwise should look like. These factors are also included in the other phases where they can interact with others factors and thus lead to a crash. *Pre-crash* is about factors in the cyclist, the bicycle and the traffic environment which during the actual cycling determine whether the normal cycling will lead to a crash becomes inevitable or not. This can be about things like how the cyclist behaves in relation to rules and the design of the infrastructure or if the cyclist is under the influence of alcohol. Other factors may be one bicycle that breaks, a lost grip or a physical obstacle in the cycle path. Under *crash* is found factors in the cyclist,

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<sup>31</sup> Spolander, 2007.



the bicycle and the traffic environment which in the actual crash determine how serious the injuries will be on the cyclist. This can be about the type of bike used or if the cyclist uses the safety equipment such as a bicycle helmet or not. *Post-crash* is about the rescue and medical efforts that deployed to care for an injured cyclist. According to the model for safe cycling, measures are required in three areas – the cyclist, the bicycle and the traffic environment – to prevent accidents and injuries. The model emphasizes that the cyclist must ride the bike safely and use appropriate equipment for himself and his bike.

The study “A model for safe cycling” resulted in several recommendations: (1) The cyclist must be given the opportunity to acquire that knowledge as well as the attitudes, norms and behaviours required to be able to ride the bicycle safely and use appropriate equipment for himself and his bicycle. This can be done with the help of information initiatives, campaigns and training. “Campaigns aimed at cyclists could, for example, reduce alcohol-related cycling and increase willing use of bicycle helmet, shoulder protection, reflective clothing, bicycle lighting, etc. “Practical training, or motoric training, should be combined with measures to also increase the cyclist’s risk awareness. (2) There is a need to develop the cycle to increase safety. It is important to produce special bikes that are well adapted to the specific needs of different groups of cyclists. This is because children and older people, those who cycle slowly or those who use the bicycle as an exercise tool and other cyclists categories have different conditions and needs. (3) Regular service and inspection of bicycles is crucial for safety.

## Summary

During the period 2015-2019, 105 cyclists died in Sweden. Of these, 61 cyclists were more than 65 years old. This corresponds to 58 per cent of all cyclists killed during the period. Thus, more than every other cyclist which has been killed in traffic has been an elderly cyclist.

Older cyclists have a number of disabilities that make them the most vulnerable and group in the bicycle traffic. Older people have an increased fragility against physical violence, which means that when an accident occurs, they are more vulnerable to severe and fatal injuries than other cyclists. Cyclists’ injuries increases significantly from the age of 75. The elderly’s ability to keep their balance is deteriorating. Age changes leads to reduced agility and muscle strength which lowers the motoric ability. Also vision decreases with increasing age. Older cyclists may have difficulty seeing pits and rocks found in the roadway which can lead to accidents. Hearing losses is very common among the elderly. More than every third person between 65 and 74 has some form of hearing loss. Restrictions on the ability to pay attention, as well as the ability to make quick decisions, can lead to accidents for older cyclists. Aging means that human reaction times become longer.

The measure that the cyclist himself can take and which has the greatest life-saving effect in the event of an accident is the usage of bicycle helmet. A bicycle helmet can reduce head injuries by 50 per cent. Head injuries are common coming among those who die or are injured in road accidents, something that could be alleviated, or completely avoided if these cyclists had worn a helmet. Older male cyclists tend to injure themselves more often at roads, intersections and roundabouts compared to older female cyclists. This may be due to a greater risk-taking among older men. It can also due to different movement patterns in traffic. For example, women often lead the bicycle over intersections. It may also be because older women opt out of the bicycle as a means of transport. A stabilization of the bicycle, a lower entry and a lower sitting position has a very large potential to reduce the number of serious injuries among older cyclists.

Alcohol exposure in connection with cycling is a well-known risk factor and a contributing cause of accidents, especially in fatal accidents. The problem of alcohol-related bicycle accidents among the elderly should be seen in the light of that alcohol consumption among older people (65-84 years) in Sweden increased by about 30 per cent in the period 2004-2018. Among other age groups, alcohol consumption decreased during the same period.

“A model for safe cycling”, developed by VTI’s research program on safe cycling, presented proposals for action, aimed at the cyclist, the bicycle and the traffic environment. The model indicates

where in the course of accidents – from conditions, pre-crash and crash to post-crash – measures should be taken and which actors are suitable to initiate and implement the measures.

## 5. Bicycle helmet use

This chapter presents the results of interviews with 17 older cyclists regarding their bicycle helmet use. Initially, an overview is made of the cyclists' use of helmets and their experiences of bicycle accidents where they were hit in the head. This is followed by an in-depth section that reports interview answers from every cyclist. The interview results are divided into two groups: cyclists from 65 to 74 are included group A while cyclists from the age of 75- are included in group B. The interview results are treated the following areas: helmet use, information on helmets, pensioners' organizations role in increasing helmet use and obstacles to increased helmet use. The chapter also addresses the issue of the cyclists' use of other protective equipment.

### Overview

Six out of eleven cyclists in the age group 65-74 always wear a helmet. Three of them never wear a helmet. One cyclist has hit his head in the ground but was not injured. This cyclist wore a helmet. None of the cyclists in this group has suffered a sustained head injury in connection with cycling. This is shown in Table 5.1.

**Table 5.1. Bicycle helmet use. Group A, 65-74.**

Cyclist	Gender	Age	Always uses helmet	Uses helmet often/ sometimes	Never uses helmet	Hit the head - <i>with</i> helmet	Hit the head - <i>without</i> helmet	Head injury	Comment
A1	Woman	68	x						
A2	Man	73		x					MTB: Always helmet Regular bike: Never helmet.
A3	Man	69		x					Uses helmet at exercise cycling, not otherwise.
A4	Man	68	x						
A5	Woman	73			x				
A6	Man	69			x				
A7	Man	69	x						
A8	Woman	68	x						
A9	Man	72	x			x			Started recently wearing helmet.
A10	Woman	74	x						
A11	Woman	65			x				Hit by car, hit the head but no injuries. Helmet used.
Total			6	2	3	1			

In the group 75-, three out of six cyclists always wear a helmet. A cyclist never wears a helmet. Two cyclists have hit their heads. Both of these cyclists wore helmets. One of the cyclists, B2, has hit head twice. No cyclist in the group has suffered a head injury (Table 5.2).

**Table 5.2. Bicycle helmet use. Group B, 75-.**

Cyclist	Gender	Age	Always uses helmet	Uses helmet often/ sometimes	Never uses helmet	Hit the head - <i>with</i> helmet	Hit the head - <i>without</i> helmet	Head injury	Comment
B1	Man	75		x					
B2	Woman	80	x			x*			Stuck with bicycle in track two times, fell forward and hit the head. No head injury thanks to the helmet.
B3	Woman	83		x					
B4	Man	76	x						
B5	Man	75	x			x			Light facial injury.
B6	Man	82			x				
Total			3	2	1				

\*B2 has hit his head in the ground twice in connection with bicycle accidents.

#### Conclusion group A + B:

Nine of the 17 older cyclists always wear a bicycle helmet. Three of these cyclists have hit their heads in connection with bicycle accidents but thanks to the helmet they survived without head injuries. Four of the 17 cyclists never wear a helmet. None of these cyclists have hit their heads in connection with bicycle accident.

#### **Results of interviews**

This department reports interviews with older cyclists regarding helmet use, information about helmets, the role of pensioners' organizations and obstacles to increasing the use of helmets.

#### **A1: woman, 68 years old**

##### Own helmet use

A1 has always had the helmet on when she has been cycling for the past 20-30 years. "I always have the helmet on when I go cycling together with bicycle keys and the bicycle pump. It belongs together." What got A1 to start wearing a helmet once upon a time was that she worked as a medical secretary and wrote medical records about people who had been injured in bicycle accidents. She then realized how vulnerable the cyclist is without a helmet. "I think this is what made me start wearing a helmet. Before, I had used a helmet only if I were to do something longer. After writing the journal entries, I realized how easy it is to hit your head."

##### Information about helmets

A1 has not received any information about bicycle helmets but would welcome information about how safe helmets really are. "I have a helmet with styrofoam inside. I'm not entirely sure it would withstand a collision with a car. I could imagine buying a helmet that protects better."

Helmet information should primarily come from the Swedish Transport Administration, which A1 considers to be the party that should have the overall information responsibility for all types of road users. Furthermore, pensioners' associations can invite people who can talk about helmets at their meetings.

**Table 5.3. A1's use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	No	
Reflective clothing	Yes	
Protection for arms/legs	Yes	Backpack made of reflective fabric
Other	-	

**A2: male, 73 years old**Own helmet use

A2 always wears a helmet when he trains with his mountain bike. When he rides his regular bicycle he wears a helmet less regularly. That he makes this difference he explains in the following way: "When it comes to mountain biking, I realize how dangerous it is. There are no problems there and there I put on my helmet. When it comes to regular cycling, I am careless when it comes to use."

Information about helmets

A2 welcomes more information about helmets. He emphasizes the importance of factual information and that the theoretical knowledge is interspersed with practical elements. "You have to show practicality. Information should both be theoretical and practical. There is a risk that the helmet information will be too theoretical."

The role of pensioners' organizations

A2 believes that pensioners' organizations should work to increase their members' helmet use.

Obstacles to increasing helmet use among older cyclists

According to A2, the power of habit is a significant obstacle to increased helmet use among older cyclists. "To change a habit and rethink takes time. Another obstacle is that many people think that bicycle accidents happen others but not me."

**Table 5.4. A2's use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, most of the time	Uses helmet for MTB cycling, rarely otherwise
Reflective vest	No	
Reflective clothing	Yes	
Protection for arms/legs	No	
Other		Uses reflexes

**A3: male, 69 years old**Own helmet use

A3 sometimes wears a helmet. He always wears a helmet when cycling longer laps a couple of times per week. But when he rides shorter distances to carry out errands, he does not wear a helmet. A3 has been using a helmet for several years. The reason he started wearing a helmet was that he realized that he could suffer a bicycle accident and injure his head. This insight came later in life: "I thought about it more when I got older. When I was younger, I did not think that way."

Information about helmets

A3 believes that more information is needed about bicycle helmets. "I do not know if I have seen any information at all. NTF could go out with a folder for households informing about how important it is

to wear a helmet.” The helmet information that A3 requests needs to be about that the helmet can really save lives. “I think this knowledge is lacking among many cyclists today. Many reason that an accident does not happen to me.”

#### Obstacles to increasing helmet use among older cyclists

The main reason why some older cyclists do not wear a helmet is, according to A3, indifference to the helmet when they cycle shorter distances:

“You do not think about the consequences. Many people think that they cycle only short distances and in the short run, they do not think they need to put on the helmet because they do not think it will happen something.”

**Table 5.5. A3’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, sometimes	Wears a helmet for longer distances
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

#### **A4: male, 68 years old**

##### Own helmet use

For the past ten years, A4 has always used a helmet when cycling. The reason he started wearing a helmet was that he heard about other people’s accidents.

“Several people I know had fallen over and hurt their faces and heads. I had one friend who drove into a triangular cement barrier without a warning sign. He did really badly, had his teeth knocked out, etc.”

##### Information about helmets

According to A4, there are several actors who need to push the issue of bringing about an increased use of helmets among older cyclists:

“Everyone has a certain responsibility: the municipalities, NTF, the police, the Swedish Transport Administration, the pensioners’ organizations. The pensioners’ organizations have people in charge of traffic who provide information. I think it is pitifully bad that the municipalities do not offer road safety education at any time during the nine years you go to school. The Swedish Transport Administration needs to inform about helmets.”

#### Obstacles to increasing helmet use among older cyclists

According to A4, an obstacle to increased helmet use among older cyclists is that many people think that “it does not happen to me or I am a better cyclist than the average.”

**Table 5.6. A4’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	Yes, sometimes	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

### **A5: woman, 73 years old**

#### Own helmet use

A5 has never used a bicycle helmet. She mentions several reasons for this position:

“Most of the time I used to wash my hair in the morning. I left home before my hair became dry and then it became a ring around head if I wore a helmet. In the winter I had a pretty big cap with a tassel on and then I would never have been able to get on the helmet. Another reason is that I think that helmets are very ugly and that I look stupid in a helmet.”

#### Information about the role of helmets/pensioners’ organizations

According to A5, she has not received any information about helmets. “But I know why I should use helmet: to protect my head and brain if I fall.” A5 believes that increased helmet information can create a kind of peer pressure that will increase helmet use: “The more information, the more people who wear helmets, the more common it becomes for cyclists to wear helmets. It will become a habit for more people to wear the helmet.”

According to A5, it is important to show statistics regarding helmet use, elderly people’s bicycle injuries and the number of elderly cyclists killed. “Such statistics would affect me. If there were statistics showing that is dangerous, it would affect me.”

In order for the helmet information to be successful, it must be presented in the right way in the right context for example within a pensioners’ association:

“I am a member of both PRO and Active Seniors, which publishes newspapers and magazines. There would you can have a box that tells how many people die in the traffic and who do not have a helmet. That would make an impact. You look in those magazines. But the municipality could also send letters with information to the elderly.”

At the same time as informing about the risks associated with cycling, one should also inform about the benefits with cycling:

“It cannot be emphasized enough that older people need to move. To move and think about what you eat is what can keep you healthy and that you do not age so fast. Everyone knows that. But the benefit of cycling must be emphasized in connection with warning against cycling without a helmet. The climate aspect should also be included, that it is good for the climate to cycle instead of going by car.”

#### Obstacles to increasing helmet use among older cyclists

In A5’s view, an obstacle to increased helmet use among older cyclists is that the helmet can be perceived as a very ugly thing to put on the head. Another obstacle is that it could be impractical.

**Table 5.7. A5’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	No	Wears a helmet sometimes when training with the bike
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

**A6: male, 69 years old**

Own helmet use

A6 never uses a bicycle helmet because he thinks that helmets are extremely ugly. “It is possible that I will buy a helmet in the future, provided that I find something that I think is pretty nice.”

Information about helmets

A6 states that pensioners’ organizations have many issues on their agenda and the issue of helmets is one of the issues he thinks they should pursue.

**Table 5.8. A6’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	No	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

**A7: male, 69 years old**

Own helmet use

A7 started using a helmet he I started cycling three years ago after a long break. “When I started to cycle the helmet came with the bike”. The reason A7 wears a helmet is that “you understand that the day something happens I will be happy to have it on. It’s about care about my own health.”

How to increase helmet use among older cyclists

In order to get more elderly people to wear helmets, A7 believes that information should be disseminated about how many older cyclists die and are injured in traffic. He further explains: “You need to show the difference between an accident with and without a helmet. One need to raise awareness in general about how well a helmet protects.”

The role of pensioners’ organizations

According to A7, pensioners’ organizations could very well get involved in getting more older cyclists to wear a helmet.

“Society could in an appropriate way offer to come to pensioners’ organizations meetings and inform about bicycle safety for the elderly. That would be very good. They certainly would appreciate if there was anyone who went to them out for free and talked about safety issues.”

**Table 5.9. A7’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	



**A8: woman, 68 years old**Own helmet use

A8 always wears a helmet when she rides a bicycle and she has done so for a longer time. An important reason for this is that she has a brother who was severely head injured after a traffic accident (however not bicycle accident). In addition, since she has been an intensive care emergency nurse and in her work she used to see many people with traffic injuries. A8 has also worked with public health issues with, among other things, a focus on injury prevention measures where bicycle accidents were brought to the attention.

How to increase helmet use among older cyclists

To increase the use of helmets among older cyclists, A8 emphasizes the importance of personal encounters with elderly people who regularly come to meeting places. In such places it is possible to influence people. In her own municipality there are about fifteen such meeting points. Older people go there to meet other people. They are offered a range of activities such as learning how mobile phones and computers work. According to A8, these meeting places are very suitable to use to spread information about bicycle helmets. "It's easier to reach out there where people meet." A8 further recommends collaboration with the National Board of Health and Welfare, which produces information material on what can be done to prevent fall accidents. Bicycle safety issues including the importance of using helmet could be added to that material. It may also be worthwhile to explore the possibility of collaborating with the national fall injury prevention week called "Balance more" arranged by the National Board of Health and Welfare.

The role of pensioners' organizations

A8 believes that pensioners' organizations can play an important role in increasing helmet use among older cyclists. She points out that the large pensioners' organizations have committees for wellness and the like. Among other things, a focus on physical activities and here there may be an interest in lifting helmets question, according to A8. "Here, information about bicycle helmets can be presented without resistance."

Obstacles to increasing helmet use among older cyclists

When it comes to obstacles to increasing the use of helmets among older cyclists, A8's opinion is that the power of habits is important. Obstacles are that the helmet affects the hairstyle ("presses to the hair"), it can get hot and sweaty with the helmet on and that you do not know where to take off the helmet when you have parked the bike. Another obstacle is that better helmets are quite expensive.

**Table 5.10. A8's use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	Yes	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

**A9: male, 72 years old**Own helmet use

A9 always wears a helmet when cycling. He started using it frequently only six months ago. He explains his helmet use as follows:

"It is related to my health situation. I feel that I am not immortal. I did not think of my health before and just drove on. The older I got, the more scared I have become. I realize that life will end sometime. I try my best to stay in shape and alive without

injuries because I do not have a helmet. I have two children and four grandchildren. It would be unnecessary if an accident happened. I have an acquaintance who had a cardiac arrest when he was cycling downhill. He hit his head and suffered a brain damage. Since then, he has had problems with speech and the balance. He never came back. His life became a misery. He did not wear a helmet.”

#### Information about helmets

A9 believes that when informing about bicycle helmets, it is important to keep in mind that the information is a fresh produce, “it falls off after a while and needs to be refilled all the time.” To achieve real behavioural change, the information needs to be made a little more pleasurable.

“Like the Swedish comedian Tage Danielsson. Tage talked about serious things in a very intelligent and pleasurable way. Use famous people who arouse respect and admiration in a helmet campaign. There is information everywhere and people are exhausted by all the information. Then it’s important to get something small extra. Maybe some series on TV. A small funny series where you use the bike. Not just through written information in a newspaper. People do not take the time to immerse themselves. It must be a little more bang on.”

#### Obstacles to increasing helmet use among older cyclists

A9 sees several obstacles to achieving increased helmet use among older cyclists.

“For those who have not used a helmet, I think something special must happen. Some people, above all women, do not want to wear a helmet because they think they are getting ugly in their hair. It disturbs their appearance, they are not used to it, it feels awkward to wear a helmet. Appearance fixation and the power of habits are important obstacles. Those who want to absorb information do so. It’s like the theater: Those who go to the theater do it, others do not. They live in their own small worlds. Therefore it is very difficult to change behaviour.”

**Table 5.11. A9’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

#### **A10: woman, 74 years old**

##### Own helmet use

A10 has always used a helmet when cycling.

##### Information about helmets

A10 states that she has tried to stay informed about the development of bicycle helmets. She has friends who use the Hövding helmet.<sup>32</sup>

##### How to increase helmet use among older cyclists

According to the A10, the most important thing is to get more pensioners to start cycling. To then get them to wear a helmet is not an insurmountable difficulty:

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<sup>32</sup> Hövding is an airbag bicycle helmet developed in Sweden. It was launched in 2011.

“There seems to be many older people who do not dare to cycle. People who do not cycle do not get enough exercise, especially if they are not physically active in other ways. I think that’s a little sad. It is about overcoming the fear about cycling and understanding that it is possible to cycle when you are older. If you only get people to dare to go out on a bike, I also think you can also get them to start wearing helmets.”

#### Obstacles to increasing helmet use among older cyclists

A10 has a hard time imagining that a cyclist would refrain from buying a regular functional helmet because of the price. Helmets are not expensive, she believes. “The only obstacle is that you have too bad fantasy about how dangerous it is to be out cycling without a helmet. It’s all about explaining the risks.”

**Table 5.12. A10’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

#### **A11: woman, 65 years old**

##### Own helmet use

A11 states that she does not wear a helmet when she rides a bicycle and has never done so.

“It’s not that I’m afraid of my hairstyle or anything like that. I just did not come into the habit that I should wear a helmet. I’ve thought of it sometime because I have an electric bike too.”

##### Information about helmets

A11 has worked in the healthcare sector for many years and has seen what damage a bicycle accident can cause. A11 therefore thinks that she does not need to receive further information about bicycle helmets. “I know just how stupid I am not to use it.”

A number of years ago, she participated in a project held by the municipality where the goal was to increase cycling to work. The participants received a bicycle helmet together with rainwear. “But I never used the helmet when I cycled to work.”

A11 believes that pensioners’ organizations should actively pursue the issue of the need for increased helmet use among older people. “It is especially important for electric cyclists, including myself, who come up at a fairly high speed.”

#### Obstacles to increasing helmet use among older cyclists

An obstacle to increased helmet use among older cyclists is that the bicycle helmet was not in use when they were young. Thus, no early habit of wearing the helmet could be established:

“In contrast to my children, we seniors have not had a helmet from the start. When I was small there were no bicycle helmets available. In order to get people to use the helmet a legal requirement is needed, just like with moped helmet. You do not want to pay a fine so you take on the helmet. I would have done it anyway. I had not stopped cycling just to avoid getting on a helmet.”

**Table 5.13. A11's use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	No, never	
Reflective vest	No	
Reflective clothing	Yes	
Protection for arms/legs	No	
Other	-	

**B1: male, 75 years old**Own helmet use

B1 usually wears a bicycle helmet because he is aware of what injuries can do to the head and brain. However, he does not always wear a helmet when cycling shorter distances on roads with little traffic. B1 started wearing a helmet about 15 years ago. It was his wife who suggested he should start wearing helmets. They both bought helmets at the same time. His motivation for wearing a helmet has increased over time.

Information

B1 has read about bicycle helmets online. He would like more information about bicycle helmets, especially if there are news about bicycle helmets that would mean comfort or safety changes radically compared to today's products. The information that may be of interest to B1 is a comparison of tests showing the improvement of the new products.

B1 believes that a helmet message should be conveyed in several different ways. This is to capture different categories of personality types among the recipients of the message. "In some cases, you just have to say that it is dangerous. Others may need some evidence."

According to B1, it is important provide information about helmets in an educational way and to clearly state what may happen in accidents without a helmet. The message can be conveyed in many ways: "Sometimes it may be needed pictures, sometimes a lot of text may be needed. Sometimes it is enough to say one thing."

The role of pensioners' organizations

According to B1, pensioners' organizations can provide information about bicycle helmets, for example by inviting members to lectures. There are local associations that have appointed people who provide information on road safety.

Obstacles to increasing helmet use among older cyclists

"Teaching old dogs to sit can be difficult at times. Otherwise, there are no obstacles."

**Table 5.14. B1's use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, most of the time	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

**B2: woman, 80 years old**Own helmet use

B1 has been wearing a helmet for at least 30 years and recently acquired a helmet with double shells.

“When you started with a seatbelt, I used a seatbelt. Same with the helmet, when it started to come helmets so I bought a helmet right away. I think it was important to protect the head. I have a good friend whose son is a neurologist and operates many who fall over and he bothers everyone that they should wear a helmet.”

#### Information

B2 believes that those who repair and sell bicycles should try harder to get more cyclists to buy a helmet. They should provide helmet information every time a bicycle is sold. The traffic administration in the city of Gothenburg has made a brochure about cycling that contains different kinds of advice and information. According to B2, this type of information material is available at bicycle dealers in Gothenburg.

#### The role of pensioners’ organizations

According to B2, it is important that the pensioners’ organizations work to increase the use of helmets among their own members.

#### Obstacles to increasing helmet use among older cyclists

According to B2, an obstacle to increasing helmet use among some older female cyclists is that they believe that the helmet is harmful to their hairstyle. “They say the helmet pushes down the hair.”

**Table 5.15. B2’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	Uses a helmet with you double shells.
Reflective vest	Yes	Has one vest for winter cycling, one for summer cycling.
Reflective clothing	No	
Protection for arms/legs	No	
Other	Yes	Reflexes around arms and legs.

### **B3: woman, 83 years old**

#### Own helmet use

B3 has been using a helmet since the 1990s. “But sometimes I have cheated and did not put on my helmet.”

#### Information

In the 1990s, B3 was a member of a safety committee at her workplace. Her workplace began promote an increased use of bicycle helmets among the employees. Different departments began to gather their employees for helmet testing. Thanks to this, many employees began to wear helmets.

#### How to increase helmet use among older cyclists

One way for seniors to remember to use the helmet is to store it in the bicycle basket. B3 says the following: “It is good if the helmet is in the basket as a reminder. If you have the helmet at home on a hat shelf and forget it when you have gone out then you will not go back for it.”

#### Obstacles to increasing helmet use among older cyclists

According to B3, an obstacle to increased helmet use among older cyclists is that the hairstyle may become damaged by the helmet. “If you are going to a really special event then you cannot wear a

helmet if you intend to cycle.” In addition, B3 thinks that she does not feel good looking in the helmet. “It’s about vanity many times.”

**Table 5.16. B3’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, most of the time	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

#### **B4: male, 76 years old**

##### Own helmet use

B4 started wearing a helmet some 7-8 years ago. His wife then had a bicycle accident and did not use a helmet. Since then, both of them wear helmets. They remind each other of the helmet every time they go for bicycle trips. B4 describes the accident as follows:

“My wife was hit by another cyclist who came downhill on a bike path in one bicycle tunnel at a fairly high speed. It was a woman who was cycling with a small child. My wife hit the street and so did the little child. My wife hit her head in the ground and got a concussion.”

##### How to increase helmet use among older cyclists

B4 believes that the state and the municipalities should subsidize the purchase of bicycle helmets. It is better to subsidize bicycle helmets than subsidizing electric bicycles. It is particularly important to promote the use of among people with an immigrant background because their helmet use is very low.

##### The role of pensioners’ organizations

B4 proposes that when the pensioners’ organizations have their meetings, they could invite someone who knows more about helmets and cycling. B4 has himself visited a pensioners’ organization and informed about traffic safety issues.

##### Obstacles to increasing helmet use among older cyclists

B4 believes that an obstacle to increased helmet use among the elderly may be that women may think that the helmet is harmful to their hairstyle. For some groups, such as immigrants, it may seem expensive to buy one helmet.

**Table 5.17. B4’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, most of the time	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	Yes	Reflex on the body

#### **B5: male, 75 years old**

##### Own helmet use

B5 has been wearing a helmet since he started cycling to work in the 1970s. The reason for this decision was his realization that the helmet protects the head in bicycle accidents. “When I had used the helmet for a while, it became a habit. In the winter, it got cold to wear a helmet without a hat and then my wife bought a thin hat that fit under the helmet.”

#### How to increase helmet use among older cyclists

According to B5, the use of helmets among older cyclists needs to be promoted in a collaboration between municipalities, government agencies, pensioners’ organizations and other stakeholders, etc. These efforts could be supplemented by information dissemination between the cyclists themselves according to the word-of-mouth method.

“I do this when e.g. attending a meeting somewhere. Many cyclists to the same meeting - some have helmet while some others do not. To people who do not have a helmet, I usually ask: Where is your helmet? Then you get answers like ‘I forgot it at home’, ‘I did not want to ruin my hairstyle’, ‘I drive so slowly’. Someone I spoke to thought you look so ugly in a helmet. I have heard that argument. Another argument is that on hot summer days you get sweaty during the helmet. If you go out and have lunch with a large group and raise the issue of a helmet, they get it bad conscience because they did not wear a helmet when cycling to lunch. In several cases it has given effect.”

**Table 5.18. B5’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	Yes, always	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	-	

#### **B6: man 81 years old**

##### Own helmet use

B6 never wears a helmet. He considers himself cycling too short distances to wear a helmet:

“I know everything about helmets but I think it’s an extra inconvenience for me to put it on given that it’s as short distances as I ride. If I had cycled a mile a day, it would have been different. I ride too short. I have bought a helmet once but I only have it lying. It does not happen that I put it on. My children wear helmets when cycling the job and remind me I should wear a helmet.”

B6 could consider starting to wear a helmet if he had an incident with the bike or if he were to start feeling more shaky.

##### Information

B6 states that he is affected by statistics. If the cyclists’ injuries increase dramatically, he would be affected by this.

##### The role of pensioners’ organizations

B6 considers that what the pensioners’ organizations should invest their resources in is a question of balance. “But given that statistics say that older cyclists are a very vulnerable group, it may not hurt to act.”

##### Obstacles to increasing helmet use among older cyclists

A key obstacle to increased helmet use among older cyclists is, according to B6, the difficulty of breaking habits in old age.

“There is a path dependency at work among the elderly cyclists. If you are used to cycling without a helmet and you continue in the direction of the key, so to speak. It costs effort to get involved in another track. The power of habit is an obstacle. It’s not really about information either. As an elderly person, you are probably informed, but habit is important. It is important to get into a new habit. It is easier to get into a new habit when you are young. For the older generation, it is harder to break the power of bad habits, the path dependency. You have been used to cycling without a helmet since your youth. To change track, it is required that you have encountered problems with cycling. Or you have had incidents, as I did this winter and realized that I should get a safer bike. Your own experience can break a habit and induce a change of the path.”

**Table 5.19. B6’s use of helmet and other protective equipment.**

Equipment	Use	Comment
Bicycle helmet	No, never	
Reflective vest	No	
Reflective clothing	No	
Protection for arms/legs	No	
Other	Yes	Gloves, also used in the summer. Reflexes.

## Summary and conclusions

This chapter has focused on older cyclists and their helmet use, how their own helmet use can increase and how information about helmets can be improved to get more senior cyclists to wear helmets. Nine of the 17 older cyclists interviewed use always bicycle helmet. Three of these nine cyclists had been hit in the head in connection with bicycle accidents, but thanks to the helmet they managed to avoid head injuries. Four of the 17 cyclists never wear a helmet. None of these cyclists have hit their heads in connection with a bicycle accident. Some of the cyclists interviewed are better at wearing a bicycle helmet than the others. Cyclists who use the bicycle for physical training have a higher helmet use than those who cycle every day to shop or visit family and friends. The former cycle faster and longer distances than the everyday cyclists, which affects the helmet use. Older cyclist who does not wear a helmet explains that the power of habit not to wear a helmet is great. Some cyclists, especially women, do not use a helmet because they think the helmet affects the hairstyle in a negative way.

According to the interviewed cyclists, the *design* of society’s information on bicycle helmets needs to be developed. Information about helmets should show how the helmet protects, both theoretically and practically. Otherwise, the helmet information becomes too one-sidedly theoretical. It is important to show the difference between a bicycle accident with a helmet without a helmet. By arranging helmet tests and presenting tests that show how helmets protect the head may arouse the interest for helmet use.

Helmet information could be carried out in several ways to capture different categories of personality types among the recipients of the message. “To some you just have to say that it is dangerous. Others need evidence.” “Sometimes pictures may be needed, sometimes a lot of text may be needed.” Some of the cyclists state that they are affected by *statistics* about elderly’s bicycle injuries, the number of elderly cyclists killed and the use of helmets among older cyclists. Access to such statistics could increase their propensity to use the helmet. One of the interviewees would



welcome more entertaining helmet information and to make use of famous people who arouse interest. Information about the risks of cycling and the importance of using a bicycle helmet can be beneficial combined with information about the benefits that cycling brings about viz. physical exercise and reduced environmental impact.

*The way in which the information about bicycle helmets is conveyed* is important for how the information affects the target group. For the helmet information to be successful, it should be presented in an appropriate context, for example within a pensioners' association. Representatives of municipalities, the Swedish Transport Administration or NTF, could come to pensioners' associations and meeting places to talk about helmets and other bicycle safety issues. "It is easier to get out to where people meet." Furthermore, bicycle dealers could convey information about helmets and other bicycle safety issues to older cyclists. TV programmes about elderly people's cycling, including various safety aspects, could arouse interest among some older people. Because older people often watch TV, they have a great potential to embrace road safety messages conveyed through this medium.

Lastly, there is a possibility to care for friends and acquaintances who cycle without a helmet by reminding them about the importance to wear a helmet.

## 6. The bicycle: equipment and status

In this chapter reporting of interviews with 17 older cyclists continues. This chapter deals with the safety performance of bicycles and the cyclists' interaction with their bicycles with a focus on balance and control. Initially, an overview is made of the status of the bicycles used for use of a ladies' bicycle or a men's bicycle, accidents related to the condition of the bicycle, accidents related to boarding and disembarkation and the cyclists' ability to have ground contact with their feet when sitting on the saddle. In addition, cyclists' experience of winter cycling and the use of studded tires is presented.

### Overview

Table 6.1 below shows that in group A, cyclists on the age group 65-74, one in six male cyclists uses a ladies' bicycle. One cyclist (A9) has been injured in a bicycle accident that was mainly caused by a bicycle in a very poor condition. No cyclist in group A has suffered an accident in connection with boarding/disembarkation. However, a female cyclist (A10) had a serious incident in connection with boarding which led to her becoming afraid of cycling afterwards. Six of eleven cyclists are not able to have ground contact with their feet when they sit on the saddle. Three of the five women in the group (60 per cent) have no ground contact with their feet. A2 uses one of the pedals as a step to get up on the saddle.

**Table 6.1. Bicycle status and related accidents. Group A, 65-74.**

Cyclist	Gender	Age	Ladies' / Men's bicycle	Accident due to bicycle's condition. No injury	Accident due to bicycle's condition. Injury	Accident at boarding/ disembark. No injury	Accident at boarding/ disembark. Injury	Ground contact with feet	Comment
A1	Woman	68	L	-	-	-	-	Yes, partly (with toes)	Uses one pedal as a step to come up on the saddle.
A2	Man	73	M	-	-	-	-	No	Has two bikes: MTB and a conventional.
A3	Man	69	M	-	-	-	-	Yes	
A4	Man	68	M	-	-	-	-	Yes	
A5	Woman	73	L	-	-	-	-	No	
A6	Man	69	L	-	-	-	-	Yes	
A7	Man	69	M	-	-	-	-	No	
A8	Woman	68	L	-	-	-	-	No	
A9	Man	72	M	-	x	-	-	No	Sudden stop in the wheel, flew over the handlebars. Shoulder injury. Caused by old bicycle in bad condition.
A10	Woman	74	L	-	-	-	-	No	Close to fall at boarding, became afraid of cycling.
A11	Woman	65	L	-	-	-	-	Yes	
Total								Yes: 5 No: 6	

Three out of four male cyclists in group B, 75-, use a ladies' bicycle. No cyclist in the group has been injured in a bicycle accident that can be related to a bicycle in poor condition or problems with getting on and off the bicycle. Five out of six cyclists are not able to have ground contact with their feet when they sit on the saddle. Neither of the two women in the group states that they cannot have ground contact with their feet. This is shown in Table 6.2.

**Table 6.2. Bicycle status and related accidents. Group B, 75-.**

Cyclist	Gender	Age	Ladies' / Men's bicycle	Accident due to bicycle's condition. No injury	Accident due to bicycle's condition. Injury	Accident at boarding/ disembark. No injury	Accident at boarding/ disembark. Injury	Ground contact with feet	Comment
B1	Man	75	M	-	-	-	-	No	
B2	Woman	80	L	-	-	-	-	No	
B3	Woman	83	L	-	-	-	-	No	
B4	Man	76	L	-	-	-	-	No	
B5	Man	75	L	-	-	-	-	Yes	
B6	Man	82	L	-	-	-	-	No	
Total								Yes: 1 No: 5	

#### Conclusion group A + B:

Four out of ten men use ladies' bicycles. Only six of the 17 cyclists in the two groups are able to have ground contact with the feet when sitting on the saddle. The twelve cyclists who do not have ground contact have an increased risk of accidents and injuries due to increased problems with control and balance when getting on and off as well as at sudden stops. Tables 6.3 and 6.4 below show the cyclists' experience of winter cycling and their use of studded tires.

**Table 6.3. Winter cycling and use of studded tires.\*  
Group A, 65-74.**

Cyclist	Gender	Age	Cycles at winter	Cycles with studded tires
A1	Woman	68	x	-
A2	Man	73	x	x
A3	Man	69	-	-
A4	Man	68	x	-
A5	Woman	73	x	-
A6	Man	69	-	-
A7	Man	69	-	-
A8	Woman	68	-	-
A9	Man	72	x	x
A10	Woman	74	-	-
A11	Woman	65	-	-
Total			5	2

\* Winter cycling refers to cycling on snow and ice. It does not refer to bare ground cycling during the winter.

**Table 6.4. Winter cycling and use of studded tires.\***

**Group B. 75-.**

Cyclist	Gender	Age	Cycles at winter	Cycles with studded tires
B1	Man	75	-	-
B2	Woman	80	-	-
B3	Woman	83	-	-
B4	Man	76	-	-
B5	Man	75	x	-
B6	Man	82	x	-
Total			2	1

\* Winter cycling refers to cycling on snow and ice. It does not refer to bare ground cycling during the winter.

**Conclusion group A + B:**

Seven of the 17 older cyclists in both age groups cycle in the winter, ie. on snow or ice. A larger proportion of cyclists in the age group 65-74 cycle in the winter than cyclists in the age group 75-. Only three of the cyclists who cycle in the winter stated that they use studded tires.

**Result of interviews**

This section contains interviews with older cyclists and addresses among other things, the standard of the bicycle, saddle height, the use of ladies'/men's bicycles, control and balance during cycling and winter cycling.

**A1: woman, 68 years old**

Bicycle status

A1's bicycle is about 7-8 years old. It is in a good condition and meets all legal requirements. Last time she submitted her bicycle for inspection and service was five years ago. A1 often uses the bell in the traffic.

"I think the bell saves many lives. I ring the bell a good while before that there are people on the road. I always do. Not in a fast, scary way but I ring a few times when I see them in at distance. Because then they notice that a bicycle is coming. It's really a good thing, because then noone will be surprised."

Winter cycling

A1 normally cycles in the winter (although not the last winter) but does not use studded tires.

Boarding and disembarking

Since A1 has a fairly low entry on her bicycle, she experiences no problems with getting on and off. She describes how she makes a descent:

"When I have to make a stop, I slow down to almost stationary. When I shall get off the bike I'm not sitting on the saddle. I cross with my right foot so it hangs freely in the air and put down the foot on the left side. I get my feet off in the same direction. I have always done like this. But when I brake abruptly, I jump down with both feet on the ground, one foot on each side of the bike."

When boarding the bicycle, her procedure is the following:

“When I start cycling, I am on the left side of the bike with my left foot on the left pedal. Then I go in with my right foot, sit down on the saddle and put my right foot on the right pedal. You could say that I use one of the pedals as a step.”

After getting on the bike and starting to ride, it often happens that she wobbles for 2-3 meters.

“I do not know why. If I’m in an intersection, I think I’m adapting a little. Then I maybe stand with my feet on the ground on either side of the bike and start with the left pedal and then sets me up straight from the front of the saddle. Then it feels better.”

#### Saddle height in relation to control and balance

When A1 sits on the saddle of her bike, she has ground contact with her toes, but not with her feet. To have ground contact with the feet creates a feeling of safety. But she does not want too much ground contact with her feet. If the saddle is too low, it can be too heavy to pedal, she believes. “Then it would feel that the saddle is too low and then I would get no speed when cycling, I would get no power in my legs when they are so bent. There will be no power at all.”

#### Information about the bicycle

A1 would welcome information about the bicycle and its safety.

“You can raise the question of the bicycle is in connection with talking about helmet use. The information should come from the Swedish Transport Administration but the issue can also be addressed within the pensioners’ associations.”

#### **A2: male, 73 years old**

##### Cycle status

A2 has two bicycles: a mountain bike that is about five years old and a city hybrid bike that is five or six years old. The bikes are in a good condition and meet all legal requirements. A1 maintains the bikes himself. Every two years, he submits his bicycles to a workshop for inspection and service.

##### Winter cycling

A2 bikes in the winter. He has studded tires on his mountain bike.

##### Boarding and disembarking

A1 experiences no problems with getting on and off in connection with his cycling.

“My feet are attached to the pedals. I have trained to get my feet off quickly in case of a fall. I turn my foot so it jumps off. There is enough time to do so in 99 cases out of 100. If I notice that there is too much stone, roots and other things I disconnect my feet.”

##### Control and balance

According to, A2 his balance is good due to the fact that he has done a lot of sport activities earlier in his life. He is aware of the fact that his balance ability is likely to deteriorate in the future. When he is out in the terrain with his mountain bike he makes some physical exercises to train his balance. When A2 sits on the saddle, he does not reach the ground with his feet.

**A3: male, 69 years old**

Bicycle status

A3's bicycle was bought in a used condition in the early 1990's. The bicycle was then 5-6 years old. It is in a good condition and meets all legal requirements. A3 takes care of the maintenance of the bike himself.

Winter cycling

A3 does not cycle in the winter.

Boarding and disembarking

A3 has not experienced any problems connected with getting on and off the bicycle.

Control and balance

When A3 sits on the saddle, he is able to have ground contact with his feet. According to A3, this is good for his stability.

Information about the bike

A3 believes that older cyclists need more information about how to they can improve their cycling from a safety perspective. Without such information, he thinks that they will not pay any attention to these issues.

**A4: male, 68 years old**

Bicycle status

A1 has two bicycles: a sport bicycle with ten gears, 35-40 years old, and a mountain bike, three years old. The bicycles are equipped in agreement with current legal requirements. A1 takes care of all maintenance of the bicycles himself.

Winter cycling

A4 cycles during the winter time but does not use studded tires.

Boarding and disembarking

A4 gets on and off his bikes from the right side in order to avoid getting too close to the traffic.

"You should get off to the right, but most common is to get on and off the bike at the left side. But then you end up in traffic. Should you stop and get on from the right side you have to leave a little more space on the right side. If you stay too close to the edge, you have to climb on from the left side."

Control and balance

A4 believes that some cyclists, especially sport cyclists, sit too high on the bicycle, which creates problems for them:

"They get problems when they are sitting too high. When the bike is stationary, they must either lean down the bike to be able to keep the balance or get your foot down to the ground. You try get a toe down to be able to keep the bike upright. When you have too high a saddle, you get a problem."

**A5: woman, 73 years old**Cycle status

A5 has two bicycles. She uses one bicycle, purchased in 2009, for everyday cycling in the city traffic. The second bike, which is a few years older, she uses for exercise cycling in the countryside. The bikes are in a good condition and meet all legal requirements. In connection with tire changes twice a year, she lets a bicycle repairman do a general review of the bikes.

Winter cycling

A5 bikes all year round. She started to use studded tires some 5-10 years ago.

Boarding and disembarking

A5 states that she has not had any incidents in connection with boarding and disembarking, but she thinks that it has become difficult over the years:

"I notice a little difference from before, you notice a little that you are older. You do not really have the same balance as you get older. There is no major difference but I notice that there is a little difference. I feel most of this in connection with boarding. It has become a little harder to come on the bike. When I cycle to the store, I pass a crossing on the street. I lead the bike across the street instead of cycling. Just a few years ago, I would have cycled all the way to the street. Apparently, I avoid getting on and off the bicycle."

Control and balance

When A5 sits on the saddle, she is not able to have contact with the ground with her feet.

"I do not reach the ground properly. If there is a red light on a street, I sometimes hold a pole around my hand to avoid getting off the bike. But for the most part, jump off the saddle when I stop the bicycle."

She may lower the saddle height to be able to reach down to the ground with her feet and get increased stability. But lowering the saddle, she assumes, could mean she gets less power when she pedals.

Information about the bicycle

A5 thinks that pensioners' organizations and other community organizations could provide more information about bicycle safety.

"It would be great with information. Cycling provides exercise, reduces car traffic and leads to a better environment. The bike has no emissions at all. It would be desirable to get more attention around that cycling is good and information on what you need to think about when cycling. For example, to get the advice that you could lower the saddle, wear a helmet and have a bike in good condition to get a safer ride. Why not send a concise brochure about cycling to all of the households in Uppsala? It should contain various safety recommendations and statistics so that cyclists are influenced to begin to use the helmet. Elderly cyclists would certainly read such a brochure."

Possible own measures for a safer bicycle

"I can lower the saddle height on the bike. Otherwise, I do not think the bike can be safer than it already is."

**A6: man, 69 years old**Cycle status

A6 has a three-speed ladies' bike that he bought 5-10 years ago. The bicycle is in a good condition and meets all legal requirements. The bicycle is inspected by a repairman every three years or so.

Winter cycling

A6 does not cycle in the winter if the weather is snowy, icy or rainy. He cycles those parts of the winter that have favourable weather conditions, always without studded tires.

Boarding and disembarking

According to A6, it is easier to get on a ladies' bicycle than to get on a men's bicycle. "I never understood the thing about having a bar." Thus far, he has no problems with getting on and off the bicycle. He explains it as follows: "It's because I have a ladies' bike so I do not have to throw over the right or left leg over the bar."

Control and balance

According to A6, his balance and control is sufficient when he cycles. When A6 sits on the saddle, he is able to have ground contact with his feet. Thus, when he stops at a traffic intersection, he does not have to jump off the saddle but can remain on it. For safety reasons, he folds the bicycle slightly to one side just after the stop.

Information about the bicycle

A6 believes that it is important that cyclist get updated information about the bicycle. This is a responsibility with the municipality but also with the region, which is in charge of the health care system, because it is the region that must take care of the damaged cyclists.

Possible own measures for a safer bicycle

A6 believes that what he can do to get a safer bicycle is to ensure that it is maintained in the best way, with a focus on brakes and the chain.

**A7: male, 69 years old**Cycle status

A7 has a men's bicycle that is 20 years old. The bicycle was not used for many years but began to be used by A7 in 2017. The bicycle is in a very good condition. It meets all legal requirements except that the light needs to be fixed.

Winter cycling

A7 does not cycle in the winter.

Boarding and disembarking

A7 does not experience any problems in connection with boarding, but he thinks that disembarking is a very complicated moment:

"Jumping on the bike is no big deal. However, it is a striking problem when I go off. It has to do with my agility in the legs that is not the same as when I was younger. I have such an inflexible right leg that I have to pull the leg with my arms to get over the bar. I cannot lift my leg over the package holder from behind. This means I need to buy a ladies' bike. My wife often reminds me to do that."



### Control and balance

If A7 is to have ground contact with both legs, he is not able to sit on the saddle. "To get ground contact must I slide down in front of the saddle."

### Possible own measures for a safer bicycle

Among the possible measures that A7 itself can undertake to get a safer bicycle, he mentions the following: get better light, adjust the saddle and make sure to keep the tires well inflated. He also plans to buy a ladies' bicycle.

### The role of pensioners' organizations in safer cycling

According to A7, the condition of the bicycle is something that can be addressed within pensioners' organizations and others.

"If you talk about bicycle safety in general, it is of course about how to hold after the bike so that it lasts, that the chain does not jump off, etc. The safety thinking does not include traffic rules only but also to keep the vehicle in a good condition. Of course, you have to provide information about that too."

## **A8: woman, 68 years old**

### Cycle status

A8 has a ladies' bicycle, approximately 8-10 years old. The bicycle has both foot brake and handbrake. The bicycle is in a good condition and meets all legal requirements. It is checked by a repairman once a year.

### Winter cycling

The A8 does not cycle in the winter.

### Boarding and disembarking

A8 does not experience any problems with getting on and off. "I'm quite active so I have no difficulty with my movements."

### Control and balance

According to A8, it can be shaky for her when she starts cycling after a stop at a traffic intersection:

"You stop on your bike and then you should get up on the bike and start cycling. In low speed it is a bit shaky and you usually have a car next to you." When A8 sits on the saddle, she is not able to have ground contact with her feet. "I have almost straight legs when I have my foot on the bottom of the pedal. From there it is 5, 6, 7 cm down to the ground. It's not a great distance."

A8 reflects on her sitting position when cycling:

"I feel very clearly what is comfortable and safe and what is not. If I sit very high and hang far forward, e.g. if the handlebars are far down or short, ie. a straight handlebar, it feels more uncomfortable, almost like having my head down. I feel safer to sit a little like on a rocking horse; to sit deeper down and hold the handlebars straight ahead."

### Information about the bike

A8 would welcome information about the bicycle from a safety perspective. The information could to come from NTF, Cykelfrämjandet, municipalities, bicycle dealers and be mediated on meeting places.

**A9: male, 72 years old**

Cycle status

A9 has two men's bicycle which he describes as follows:

"I have an old bicycle that I bought used by a bicycle dealer. It is a summer bike without studded tires. It is 10-15 years old and in a good condition. The second bike is of an older model, probably 30-40 years old. It has studded tires and is my winter bike. Reflectors and lights need to be updated on the winter cycle. The summer bike is more up to date. I have back and neck problems and need a high handlebar on both bikes."

A9's bicycles are seldom or never maintained. "I rarely check the bikes, in principle never, even though it is very cheap to do so. One would need to service the bikes – tighten the chain, check tires. It should be done a little more often."

The reason why A9 does not check the status of the bicycles more often is he "is not really on the track that I'll do it. I have never really done it so I have no established habit of doing it." A9 previously had a bicycle that was in much worse condition than the two bicycles he has today. The condition of that bicycle was in such a bad shape that it caused an accident some 15 years ago. A9 fell forward over the handlebars and damaged his shoulder. "In the end, the bike went down by the pedals, it broke there. That bike was in a bad condition but I cycled with it all year round."

Winter cycling

A9 cycles in the winter and uses the bicycle which is equipped with studded tires.

Boarding and disembarking

A9 perceives boarding and alighting as a risky step. "It's a little more risk than if I had had fixed ground contact. I know about the problem." When the A9 starts cycling, after getting on the bicycle, he may have problems with the balance. For this reason, he tries to have free surfaces around him when he starts cycling.

"I always check backwards and to the side so that I have no traffic near me. If there would be a little hesitation, I usually make sure it's free. It is better to have a little margin by looking around the side and back to make it as safe as possible."

A9 has sometimes considered getting a ladies' bicycle to facilitate boarding and disembarking. He has refrained from doing so from economic reasons.

Control and balance

A9 has talked to his bicycle dealer about the design and position of the handlebar and how he should sit on the bicycle in order to be able to handle his problems with his back. A9 has been advised to sit straight with his back and how to hold his arms. It has been important for A9 to find the right seat height in relation to the ground, especially when making brakes. He needs to get down from the saddle and make ground contact with both feet to be able to stand still. "I cannot sit on my saddle when I brake because the saddle is so high. I jump down from saddle, otherwise I will not get ground contact."

A9 thinks that the high seat position makes cycling less safe when he has to stop.

"It is important that I am very focused when I have to stop so that it does not happen something." When he arrives at an intersection and wants to stop, he needs to jump down from the saddle. "I can jump off the saddle, hold the handlebars and then I can jump forward and then put one foot down. I do not drive at full speed at an intersection, but take it very calmly."

#### Information about the bike

According to A9, more information is needed on how bicycles can be made safer, but it is important that information is provided in a fun way and in short sections.

“People do not have time to concentrate on information for that long. The problem today is that the flow of information is so fast. People easily change focus. We older people are also affected by the flow of information. Many people are being stressed by the information flow.”

#### Possible own measures for a safer bicycle

To improve the safety of his winter bike, the A9 believes he could buy a lighting and put it on place himself. “Now I hold the lighting, a small flashlight, in my left hand and put the loose lighting on the package holder.”

#### The role of pensioners’ organizations for safer cycling

A9 believes that pensioners’ organizations play an important role in promoting safer cycling among the elderly cyclists:

“There are more and more pensioners. We live longer. And the older generation nowadays has very high demands on society. Road safety, your own safety but also the safety of others, everyone benefits from if more people could become aware and begin to act safely. It does not cost much. It’s really very cheap to update your bike to a safer bike and wear a helmet. Nevertheless, not everyone does will do it. The power of habit power is strong. Change is always hard for some people. You continue to do what you always have done.”

### **A10: woman, 74 years old**

#### Cycle status

A10 has a five year old ladies’ bicycle. The bicycle is in a good condition and meets all legal requirements. A10’s ambition is to do a general control of the bicycle about every two years.

#### Winter cycling

A10 does not cycle in the winter.

#### Boarding and disembarking

According to A10, getting on and off the bicycle works well for her. Preferably, however, she wants to minimize these moments of getting on and off in her cycling: “I’m glad that I can just cycle on, I do want not have to stop and get on and off.” Previously, she had major problems with balance when getting on and off and became “very afraid of cycling.” Once she was close to fall headlong when she would get on the bicycle.

“I did not really have control. It was a nasty experience. That was an incident which made me afraid of cycling. I then found it very difficult to get on and off. The cycling itself was not a problem but just getting on and off. But it was temporary because the fear disappeared by training.”

#### Control and balance

A10 cannot have ground contact with her feet when she sits on the saddle. At each stop, for example at a crossing, she needs to jump off the saddle to make ground contact with her feet. She handles this without problems today but it was a difficult moment for her in the past. “During a period when I was afraid of cycling I thought it was awkward to cycle. I felt that I had no control over the situation.” A10’s previous bicycle had a significantly lower saddle height compared to her current bicycle. She thinks it

was easier to get on and off before. "The new bicycle is very good to ride, but I think it is a bit high. I would love to have a slightly lower cycle. I'll probably think about lowering the saddle a little bit."

#### Possible own measures for a safer bicycle

A10 believes there are two things she could do to get a safer bicycle: put on wheel reflectors and lower the height of the saddle.

#### The role of pensioners' organizations for safer cycling

Increased knowledge about safe cycling is something that pensioners' organizations could work with, A10 believes. "Most important is to get more older people to start cycling. That would be great, I think."

### **A11: woman, 65 years old**

#### Cycle status

The A11 has a women's bicycle which is 15 years old. The bicycle meets all legal requirements and is in a very good condition: "It looks like new." She places the bike in her garage every night, which reduces wear and tear on gears, brakes and other vital parts of the bicycle. In addition, the risk of theft is reduced. Her bicycle is controlled and maintained annually by a bicycle repairer.

#### Winter cycling

A11 cycles in the winter and then always uses studded tires.

#### Boarding and disembarking

A11 states that she has not had any problems with getting on and off in connection with her cycling.

### **B1: male, 75 years old**

#### Cycle status

B1 uses a men's bicycle that is about 20 years old. It is functional and meets all legal requirements. B1 handles service and maintenance of the bicycle himself.

#### Winter cycling

B1 does not cycle in the winter.

#### Boarding and disembarking

According to B1, he has no problems with getting on and off his bicycle.

#### Control and balance

B1 does not have ground contact with his feet when he sits on the saddle. He is anxious to have his saddle at such a height that the legs are almost extended when the pedal is at the bottom. He has tried the option to reach the ground with straight legs from saddle height:

"It is good in case of poor balance; you get a lower center of gravity so that the balance can be better, but it gives me an uncomfortable cycling. I would like to be able to stretch my legs when I ride a bike. This is what I miss if the saddle is low. It's hard to get the right height so you can moderately stretch the legs. That's my experience. It's more of an emotional thing to be able to put your feet in the ground and be able to handle an incident. If I feel insecure, it's convenient to be able to put your foot down and stand up when stopping at a pedestrian crossing, red light or something else. On such occasions it may be convenient."

#### Information about the bike

B1 believes that the Swedish Transport Administration should have a subdivision dealing with the provision of information on bicycle issues.

#### Possible own measures for a safer bike

B1 takes has taken several measures to increase the safety of the bicycle. He emphasizes the importance of having brakes of good quality, good lighting and a warning flag.

#### The role of pensioners' organizations in safer cycling

According to B1, pensioners' organizations can contribute to safer cycling by increasing knowledge among their members through various information efforts. The information should not just explain what is needed to be done but also explain why.

### **B2: woman, 80 years old**

#### Cycle status

B2 has a bicycle that is about 20 years old. It meets all legal requirements. She submits the bicycle for maintenance once a year.

#### Winter cycling

B2 does not cycle on roads with ice and snow.

#### Boarding and disembarking

B2 does not consider herself to have any problems with getting on and off the bicycle because it has a low entry.

#### Control and balance

B2 does not have ground contact with her feet when she is sitting on the saddle. "If I had ground contact, I would I do not get any power in my cycling." When she has to stop the bicycle, for example before an intersection, her normal routine id the following: She brakes, then jumps off the saddle, stands on the ground with both feet and then gets off the bike. When she starts cycling again she has her left foot on the ground and the right foot on the right pedal which is kept in a high position. Then comes up on the saddle.

### **B3: woman, 83 years old**

#### Cycle status

B3 has a women's bicycle that is about 20 years old. The condition is good and it is equipped according all legal requirements. B3 rarely hands in her bicycle to a repairman for service. The last time was two years ago.

#### Winter cycling

B3 does not cycle when it is snowing or slippery.

#### Boarding and disembarking

According to B3, the entry of the bicycle is too high:

"The frame is a little too high. I think it's hard. I am short. The bicycle is actually a little too high when I step on. I'm coming on, of course. I've been in the process of changing bicycle but it costs so much. I do not have so much money so I cycle as long as I can with this bicycle."

When it comes to getting off the bicycle, B3 says:

“It has sometimes happened that I stop a little too fast and then I quit the saddle somehow. When I stop, I have to stand cross-legged over the frame with my legs on either side the bicycle. Then I have to lift my leg over and sometimes I think it is a bit high. I may blame myself for not buying a new bicycle.”

#### Control and balance

B3 does not have, and has never had, ground contact with her feet as she sits on the saddle. The saddle was lowered past year, which B3 considers to be positive for her control and balance. However, she still has no ground contact with her feet.

#### **B4: male, 76 years old**

##### Cycle status

B4's uses a ladies' bicycle that is four years old. It is equipped according to the legal requirements and in a good condition and. B4 takes care of service and maintenance of the bicycle himself.

##### Winter cycling

B4 does not cycle in the winter because he does not want to risk falling over. He points out that even if there is not snow, it can be frostbite.

##### Boarding and disembarking

B4 has a ladies' bicycle. He thinks it is much easier to get on and off such a bicycle than a men's bicycle.

“When I had a men's bike, my leg would cross and then it was easy to wobble and easy to fall over. I had to put the bike down so as not to lose my balance. Throwing one leg first is so unnecessary. A ladies' bike is much more stable. It is much better with a ladies bicycle when you get older.”

B4 feels safer while cycling with a women's bicycle:

“You feel much safer if something would happen, if I need to stop or something else. Then I just step forward. Then there is no bar in the way. But then I have both feet in the ground. It feels safer.”

##### Control and balance

B4 is aware of the fact that many older cyclists lose their balance in connection with boarding and disembarking and easily falls to one side. “This is exactly the moment when you have to stop or get started without the right balance.”

B4 does not have ground contact with both feet when sitting on the saddle. “When I sit on the saddle I'm not really down to earth. There is a little bit left but it is not much.” He has tried to lower the saddle height to get ground contact but was not satisfied with it: “When I have lowered the saddle too much, I do not feel really safe. I'm getting better efficiency of the start-up at the very start with a higher saddle height. I feel safer with it.”

##### Information about the bicycle

The information that B4 considers necessary about his bicycle is given to him by his bicycle dealer. “When I am there and inflate the bicycle tires, I usually always exchange a few words with them. They have informed me about among otherwise brakes and shifts.”

#### Possible own measures for a safer bike

B4 points to several measures that he himself takes to get a safer bike. It's about making sure the tires are always inflated, to have reflectors where they should be, to make sure that the light works, both front and rear, to ensure that the brake works and to have a braking function in both the pedals and the handles.

#### The role of pensioners' organizations in safer cycling

B4 believes that if the pensioners' organizations received training, they could be able to help in their own organizations and check out their members' bikes.

#### Obstacles to improving bicycle safety

According to B4, there may be financial reasons why cyclists refrain from taking measures to maintain or improve the technical safety standard of the bicycle. "It is probably the economy that makes them resist from handing in the bicycle to a bicycle dealer."

### **B5: male, 75 years old**

#### Cycle status

B5 has two bicycles: one is about 25-30 years old, a men's bike, the other one is a two-year-old electric bicycle (a ladies' bike). The bikes are stored indoors to prevent theft and to keep the bikes in a good condition as long as possible. The bikes meet the legal requirements. One of the bikes is equipped with summer tires while the other one has winter tires. "Otherwise I would have had to go to the bicycle repairman and change tires twice a year. There are some practical problems with that." B5 does not hire a bicycle repairer to get general service on the bikes, only if there are faults on the bikes, e.g. puncture.

#### Winter cycling

B5 cycles all winter, always with studded tires.

#### Boarding and disembarking

B5 believes that getting on and off the bicycle works well. It is related to the fact that he has adjusted the saddle so that he can reach down to the ground with both feet. "I come to the conclusion I can sit on the bike when I have to stop at a red light. It's an example of a situation where I stop but not need to get off the bike."

Two years ago he bought a new ladies bike (electric bike) and it is the one he uses the most of the time. After an extensive knee operation, he was in need of a bicycle with a low entry due to his difficult he had with throwing his leg over the frame of his men's bikes. B5 states:

"The height of the electric bicycle's saddle was changed twice. The first time was when I bought the electric bike. I wanted to have proper ground contact with the feet and to be able to cycle with a straight knee. The straighter knee, the better for the knee. It was important to have ground contact and at the same time be able to cycle with enough height of the saddle. It was after my knee surgery that I became aware of doing this combination."

#### Control and balance

B5 can have his feet on the ground when sitting on the saddle. He has had the saddle adjusted to such a height that this should be possible. "I have adjusted the saddle so that I just reach down to the ground. Otherwise it will be difficult. I must be able to stop in different situations and be able to put a foot down."

#### Possible own measures for a safer bicycle

See above (about saddle height).

#### The role of pensioners' organizations in safer cycling

B5 believes that pensioners' organizations should have an active involvement in the issue of safe bicycles. "I think they should point out the importance of having a proper bike and using a helmet."

#### **B6: man 81 years old**

##### Cycle status

B6 has a ladies' bike that is almost 15 years old. "I have a ladies' bicycle because it a men's bicycle would be too difficult for me. It would be very dangerous for me. I have had a ladies' bicycle all my adult life." B6's bicycle has a package holder that he uses when he has picked up packages at the post office and a bicycle basket where he puts their groceries. The bicycle meets all legal requirements and it is in a good condition. B6 submits the bicycle for service every two years. When B6 gets punctures repaired, he asks the repairman for a general review of the bike.

##### Winter cycling

B6 cycles all winter but does not use winter tires.

##### Boarding and disembarking

B6 states that boarding is not a problem for him. The only problem is that the saddle a little too high up.

"I do not reach down with my feet on the ground when I sit in the saddle. I have to hurry to get off. It can really be very dangerous for me if I do not reach down to the ground with the feet. I could fall over if I have to stop quickly. For example, it can happen when I drive up from the underpass under the railway and there are buses there. I realize I have to lower the saddle height a little. I may have to go to the bike repair shop so they can do it. I might do it today before something happens to me. It has happened this autumn that I lost my balance without falling when I stop quickly. It feels like that's dangerous."

#### Possible own measures for a safer bike

B6 believes he could improve safety by starting to use winter tires in the winter and use the light evenly, not only when it is completely dark outside. Furthermore, he could take action so that the bicycle basket does not start to rust which could lead to holes in the basket.

#### **Summary and conclusions**

The interviews with the 17 older cyclists show that the cyclists' biggest problems with their bicycles is too high a saddle height. Only five out of 17 cyclists have ground contact with their feet when they sit on the saddle. This phenomenon is significantly more common among female cyclists than among male cyclists. Cyclists who cannot have ground contact with their feet have an increased risk of accidents related to boarding, hesitation at the very beginning of the journey, difficulties in dealing with sudden stops and reduced control and balance during the journey. The seat height is important for the impact energy as the cyclist's head and the body is exposed during a rollover (see chapter 4). Some of the older cyclists who cannot have ground contact with their feet, primarily women, use one of the pedals as a step when getting on to get on the saddle. They cannot stop, e.g. at an intersection, without *jumping* down from the saddle. Such behaviour entail a significantly increased risk of incidents and accidents. Table 6.5 contains an overview of methods older cyclists use when getting on and off the bicycle.



**Table 6.5. Methods for disembarking and boarding at a saddle height that do not allow ground contact with the feet.**

Descent	Boarding
<p><u>Method A:</u>  Step 1: Jump forward to get off the saddle.  Step 2: Put your feet on the ground on each side about the bicycle.  Step 3: Lift one leg over the frame.</p> <p><u>Method B:</u>  Step 1: Get up from the saddle.  Step 2: Place the right foot on the right pedal.  Step 3: Turn left with both legs together same direction.</p> <p><u>Method C:</u>  Step 1: Stop.  Step 2: Tilt the bicycle to one side  Step 3: Get off</p>	<p><u>Method A:</u>  Step 1: Use one step as a step to be able to get up on the saddle.  Step 2: Lift one leg over the frame.  Step 3: Start pedaling from a stationary position (with a high risk of wobbling)</p>

The interviews clearly indicate that older female cyclists have significantly greater problems with control and balance than male older cyclists. Women's problems are to a large extent related to their relative sitting significantly higher on their bikes than men do. The average length for women in Sweden is 166 cm and for men, 180 cm.<sup>33</sup> Despite these facts, women often have the saddle set at about the same height as men.

Excessive saddle height can lead to problems with wobbling, especially at the very beginning of the journey.<sup>34</sup> Wobbling occurs at low speeds when balance must be maintained by maneuvering with the handlebars. If wobbling occurs in an traffic intersection it entails an increased risk of being hit by a motor vehicle or another cyclist. One of the cyclists interviewed (A9), said that he usually wobbles at the beginning of the cycle journey. For this reason, he is anxious to ensure that he has free spaces around him when he starts cycling.

There are different reasons for why most older cyclists use bicycles with too high a saddle height. One reason is that they are simply not aware of the importance of seat height for safety. Several of the interviewed cyclists claimed that a lowering of the saddle height would mean that they get less force in the pedaling or that it feels uncomfortable to ride with a lower saddle height. One cyclist (B4) explained that lower saddle height would mean "a lower degree of efficiency of the start-up itself which leads to a feeling of insafety." In a previous study, women with high saddle height on their bicycles justified this by stating that they get sore knees from cycling with lower saddle height (Andersson, 2017).

One of the interviewed cyclists, A2, regularly performs balance exercises to maintain the necessary balance required to be able to ride safely. Balance training contributes to safer cycling and increases the probability that older cyclists will be able to continue cycling at an advanced age.

The interviews showed that four of the ten men interviewed use a women's bicycle. B4, a man of the age of 76, previously had a man's bicycle which caused him major problems with the balance at boarding on and off. The women's bike that he has been using for the past few years is much more stable for him. A7, a man 69 years old, still uses a men's bicycle despite having great difficulties with disembarkation. His right leg is so stiff that he must his arm to pull over the leg in order to get over the bar. A minority of the 17 interviewed cyclists cycle in the winter and not all of them who cycle during the winter time use studded tires. Boarding and disembarking in the event of snow and ice, entail increase the risk of accidents.

The bicycles used by the interviewed cyclists are usually in a good condition. Older exercise cyclists seem to a greater degree than older everyday cyclists use bicycles in a very good condition meeting

<sup>33</sup> The information refers to people aged 16-84 in 2017. *Source:* [www.wikipedia.com](http://www.wikipedia.com)

<sup>34</sup> Wobbling can also occur when cyclists transport heavy goods on the bicycle.

virtually all legal requirements. Two cyclists, A9 and B3, said that they would like to buy a new and better bicycle but are not able to afford such an expenditure.

## 7. Risk situations in the traffic

In certain situations and environments in the traffic, older cyclists experience a high degree of unsafety, for example cycling at intersections or cycling in places where cyclists are mixed with motor traffic. This chapter presents the results of interviews with 17 older cyclists regarding their ability to handle risk situations in the traffic. Initially, an overview is made of cyclists' accidents and injuries at intersections, mixed traffic and on cycle paths. This is followed by a section which reports interview responses from each cyclist. The interview results are the same as in the two previous chapters divided into two groups: cyclists between the ages of 65 and 74 are included in group A while cyclists from the age group 75- are included in group B. The interview answers deal with traffic situations that are perceived as dangerous when cycling. In addition, attention is focused to alcohol and cycling and the cyclists' own possibilities to avoid different risk situations.

### Overview

This part deals with the older cyclists' (group A + B) accidents and injuries at intersections, mixed traffic (in cities and on country roads) and on cycle paths.

#### *Traffic intersections*

The summary below shows that two cyclists in group A, 65-74, both women, have been hit by a car at an intersection. One of them was injured (Table 7.1).

**Table 7.1. Accidents and injuries in connection with cycling at intersections. Group A, 65-74.**

Cyclist	Gender	Age	Collision with motor vehicle No injury	Collision with motor vehicle Injury	Single accident No injury	Single accident Injury	Comment
A1	Woman	68					
A2	Man	73					
A3	Man	69					
A4	Man	68					
A5	Woman	73		x			Hit by a car in an intersection, A5 made a left-turn. Hit kerbstone with a knee. Later operated for a complication.
A6	Man	69					
A7	Man	69					
A8	Woman	68					
A9	Man	72					Very close to collision with a car. A9 was in the blind spot.
A10	Woman	74	x				Hit by a car at an intersection at the pedestrian crossing. No injuries.
A11	Woman	65					
Total			1	1			

Table 7.2 below shows that two cyclists in the group 75- have had a single accident in an intersection. None of them were injured.

**Table 7.2. Accidents and injuries in connection with cycling at intersections. Group B, 75-.**

Cyclist	Gender	Age	Collision with motor vehicle No injury	Collision with motor vehicle Injury	Single accid. No injury	Single accid. Injury	Comment
B1	Man	75					
B2	Woman	80			x		
B3	Woman	83					
B4	Man	76					
B5	Man	75			x		Stopped at crossing, lost balance due to ice, fell headlong to the side. No studded tires.
B6	Man	82					
Total					2		

#### Conclusion A + B:

In total, four of the 17 older cyclists in total have been involved in accidents at intersections. Two of the accidents were single accidents.

#### *Mixed traffic in urban areas*

Three cyclists in the age group 65-74, have had accidents in connection with cycling in mixed traffic in urban areas. Two of these accidents were single accidents. In a third accident, a cyclist was hit by a car.

**Table 7.3. Accidents and injuries in connection with cycling in mixed traffic, street in urban areas.**

#### **Group A, 65-74.**

Cyclist	Gender	Age	Collision with motor veh. No injury	Collision with motor vehicle Injury	Single accident No injury	Single accident Injury	Comment
A1	Woman	68					
A2	Man	73					
A3	Man	69					
A4	Man	68					
A5	Woman	73			x		Fell to the ground, icy on the street. No studded tires.
A6	Man	69				x	Cycled on street well, fell over, hit the shoulder. Treatment at hospital for muscle injury.
A7	Man	69					
A8	Woman	68					
A9	Man	72					Close to being run over by bus at pedestrian crossing.
A10	Woman	74		x			Hit by car at pedestrian crossing.
A11	Woman	65					
Total				1	1	1	

A cyclist in the group 75-, has had an accident in connection with cycling in mixed traffic in urban areas. At the accident, the cyclist was hit by a car that made a u-turn. The cyclist received minor injuries (Table 7.4).

**Table 7.4. Accidents and injuries in connection with cycling in mixed traffic, street in urban areas.**  
**Group B, 75-.**

Cyclist	Gender	Age	Collision w. motor vehicle No injury	Collision w. motor vehicle Injury	Single accid. No injury	Single accid. Injury	Comment
B5	Man	75		x			Frontal collision with a car who made a u-turn, fell headlong on one side. Facial injuries.
B6	Man	82					1.Incident at parking place. 2.Incident at unattended railway crossing.
Total				1			

#### Conclusion A + B:

In total, four of the total of 17 older cyclists have been involved in accidents in connection with cycling in mixed traffic in urban areas. Two of the accidents were collisions with motor vehicles and caused injuries.

#### *Mixed traffic, country road*

Table 7.5 below shows that a cyclist in the group 65-74 has had a single accident in connection with cycling on country roads in mixed traffic. The person survived without injuries. No cyclist in the group 75- stated that they had suffered an accident.

**Table 7.5. Accidents and injuries in connection with cycling on country roads, mixed traffic.**  
**Group A, 65-74.**

Cyclist	Gender	Age	Collision with motor vehicle No injury	Collision with motor vehicle Injury	Single accid. No injury	Single accid. Injury	Comment
A4	Man	68			x		Drove on a bump on a private road.
Total				1			

#### *Bicycle path*

A cyclist in the age group 65-74 has had a single accident in connection with cycling on a cycle path. The person in question survived with minor injuries (Table 7.6). No cyclist in the age group 75- has experienced an accident on a bicycle path.

**Table 7.6. Accidents and injuries in connection with cycling on a cycle path. Group A, 65-74.**

Cyclist	Gender	Age	Collision with motor vehicle No injury	Collision with motor vehicle Injury	Single accid. No injury	Single accid. Injury	Comment
A11	Woman					x	Cycling into a metal boom at high speed. Threw herself off the bike. Minor injuries.
Total						1	

## Results of interviews

The following section reports interviews with older cyclists on how they handle different situations and traffic environments that they perceive as unsafe, such as cycling at intersections and the risk of ending up blind spot near larger vehicles. Furthermore, the issue of alcohol consumption in connection with cycling is addressed.

### A1: woman, 68 years old

#### Situations perceived as particularly dangerous when cycling

There are several types of traffic situations which A1 perceives to be unsafe. An example is when she crosses a street at a pedestrian crossing or an intersection. At such situations she prefers to lead the bicycle.

“If there are cars, then I will at least stop and wait and see if they intend to stop or not. More cars stop and let me go if they see that I am leading the bike. I usually slow down so that both the cars and me are sure of who will drive first. If it is a very narrow place to ride, perhaps I will also lead the bike.”

A1 is aware that as a cyclist one can end up in the blind angle near buses and others vehicles and in such situations she is on her guard.

#### Alcohol and cycling

According to A1, alcohol and cycling do not belong together. But she knows that some people think that when they are at a party, they can cycle home instead of using the car.

“If you have had a glass of wine it doesn’t matter. But if you are drunk you should probably not go cycling. You should not feel that you are under the influence of alcohol, that you wobble when you walk, then you should not cycle. I have probably cycled home if I have had one or two glass of wine.”

### Information

A1 believes that there is a need for increased awareness and more information about older cyclists' risks in the traffic. "People who have had bicycle accidents should be allowed to talk about what they have been through. Then people can stay more aware."

### **A2: male, 73 years old**

#### Situations perceived as particularly dangerous when cycling

When A2 cycles to the city, it happens almost daily that he gets so close to trucks and buses in a way that feels insecure. "Trucks and buses are big problems." A2 is also insecure when he cycles at streets without cycle paths. "As soon as I am among cars I know who gets hurt up if something happens." When A2 is about to cross a street, he is especially attentive and try to take it easy.

"I have learned where I should be careful and I accept this. Since I've been cycling for a long time I have learned to adapt to the situation. I do not demand that someone stops for me if there is no obligation to stop."

When A2 arrives at an intersection, he is usually very careful and does not blindly trust the priority to the right rule:

"I do not just cycle straight ahead because I have the right to cycle and the car is supposed to give me priority. Then I'd rather hold back a bit and try to make eye contact. I'm not just driving out of the intersection. I'm too old for that. Over the years I have learned to be careful, I do not trust others because they may not see me."

A2 believes that if a cyclist relies too much on the right-hand rule at a traffic intersection, he or she take the risk to be exposed to danger.

"Rules are there to be followed but not everyone follows them for some reasons. I have to be careful. The car may not stop, may not give way. I have to be prepared for this. I cannot take things for granted."

### Alcohol and cycling

According to A2, one should not cycle after drinking alcohol. He notes that there is no formal term for drunk cycling. At the same time, he argues that it is better to cycle home than to use the car. "But if you are really drunk, you should avoid the bike as well. I have an acquaintance who was injured."

### **A3: male, 69 years old**

#### Situations perceived as particularly dangerous when cycling

In the community where A3 lives, there are several traffic intersections and he is concerned about having good supervision at these places.

"You have to watch out in the intersection. The speed limit has been lowered to 40 km/h in the community but not everyone keeps 40. There are moped riders who absolutely do not meet the speed limitation."

### Alcohol and cycling

A3 believes that alcohol in connection with cycling is a general problem today. There are too many people who use the bicycle instead of the car when they have drunk alcohol. A3 does not think he will get to experience regulations on alcohol limits for cyclists during their lifetime. "The police should be able to check as well but they do not have the time for that."

**A4: male, 68 years old**

Situations perceived as particularly dangerous when cycling

A4 points to several situations in the bicycle traffic that he perceives as being dangerous:

1. Too narrow roads trafficked by large trucks. The safe distance between motor vehicles and unprotected road users has been legally defined but it is not respected. "Of course I am close the heavy vehicles sometimes and it's pretty scary."
2. Cycling in roundabouts. Accidents have occurred in roundabouts when trucks have run in without noticing the cyclist who was there.
3. Lack of knowledge of the priority to the right rule. The priority to the right rule applies to all vehicles, also bicycles.

Own possibilities to avoid different risk situations

According to A4, it is challenging to cycle in large intersections which have two lanes in each direction. A4 usually leads his cycle over such intersections.

Information

According to A4, more information is needed about cycling at intersections because there are great risks there for cyclists.

"Some road users who only drive a car and do not cycle at any time probably do not realize that you have to cycle straight ahead and then make a big turn. Instead of making this turn, you should as a cyclist find other solutions, e.g. use the crosswalk."

Alcohol and cycling

A4 believes that it is important to inform that if you are drunk while cycling you can be convicted for negligence in the traffic (but you cannot be convicted of drunk driving). It is also important to inform about the inadequacy of cycling drunk because one becomes an inferior cyclist with alcohol in the body.

"Here in Sweden, it is frequently the case that you go to a social gathering in the evening where alcohol is served and return home by bicycle rather than the car. You cannot be convicted of drunk driving, you are aware of that. But, of course, you may be equally as unsuitable for being in traffic."

A4 believes that the state authorities in Sweden should make a strong information effort about alcohol and cycling:

"The Swedish Public Health Agency and the police should inform about alcohol and cycling. Systembolaget can also participate. Systembolaget has a long history of advertising against itself. Advertising on TV could also be used. Different organizations, such as municipalities and regions, could come together to make it possible."

**A5: woman, 73 years old**

Situations perceived as particularly dangerous when cycling

Cycling on a country road without access to a cycle path creates problems for A5: "When I hear a car coming at a curve, I move out off the road. I would like the roadside to be wider. I would like that there was a bike path all the way into the city."

A5 feels also unsafe to cycle on certain cycle paths in city traffic in winter: "The bicycles lanes are life-threatening in the winter time. I can really sign on to that. I do not dare to cycle on some bike paths due to slipperiness and snow."



### Alcohol and cycling

According to A5, alcohol and cycling do not belong together. She believes that there should be the same rules for cycling as when driving a car. "It is strange that there are no rules for cycling and alcohol. When cycling on two wheels you really need to have balance. And it is the balance you lose when you drink."

A5 states that it is dangerous to cycle home from a party after drinking, but there are no rules which forbids you to do that. That is why many cyclists do it. It has happened that A5 has cycled home from dinner parties where she had drunk one or two glasses of wine. She believes that it had an impact on her cycling. "Nothing happened but I have started to think about it."

### Information

According to A5, it would be desirable if the Swedish Transport Administration, together with municipalities and various organizations, could provide some information about alcohol and cycling to the general public. It is important to inform people about the necessity to avoid cycling when they have drunk alcoholic beverages.

### Obstacles to reducing the risk behaviour of older cyclists

An obstacle to increasing older cyclists' risk awareness could be that they receive information, e.g. a brochure, but does not read it. "You think you know everything yourself and think you are already careful."

### **A6: male, 69 years old**

#### Situations perceived as particularly dangerous when cycling

A6 claims intersections are unsafe for him when he rides a bicycle. Cycling in a traffic intersection requires a number of planning steps: you have to slow down, you have to look around, etc.

Another problem for A6 is cycle paths that are combined with footpaths. According to A6, the paths should be coloured and separated.

#### Own possibilities to avoid different risk situations

A6 avoids cycling in roundabouts. "You have to plan your bike ride a lot. I cycle the most on cycle paths that are separated from other traffic."

### Alcohol and cycling

In A6's view, the same rules should apply to cycling as to driving a car in the case of alcohol intoxication. "It has happened that I have cycled after drinking alcohol. But I try to avoid it."

### Information

A6 does not think he needs more information about safe cycling. "I have learned what I need to know during the time I have been out cycling since I was a small child. It comes a long way down on my priority list."

### **A7: male, 69 years old**

#### Situations perceived as particularly dangerous when cycling

A7 believes that traffic intersections with reduced visibility create a security problem for him. "Blurred visibility at road junctions where cars can reach higher speed requires extra attention." High speed bikes and high speed paths for cyclists also create problems for A7.

"It is pure sabotage against the older generation when young people are encouraged to behave like maniacs on the bike paths. You barely have time to react when they come and

drive on the right and left side at the same time. They show no respect. It is most disgusting and very common.”

#### Own possibilities to avoid different risk situations

A7 cycles very carefully at traffic intersections. “It is important to adapt the speed to potential meetings with other vehicles.”

#### **A8: woman, 68 years old**

Situations perceived as particularly dangerous when cycling at narrow and dark roads where you cycle among other vehicles, the A8 experiences as most unsafe when she bicycles.

“When I get run over by a bus when I cycle here in the country where I live, it feels quite uncomfortable. There are very heavy vehicles that travel the stretch where I have to cycle. But that’s why I don’t cycle that often because it is like it is here. The heavy vehicles make me use the bike less. Had there been a bicycle path, also maintained in the winter, I and many others would have cycled much more from here.”

A8 has no experience of incidents at crossings but thinks there are complicated situations at intersections with ambiguities regarding the application of the right-hand rule:

“You share a road with cars and arrives at a traffic light. You stop and wait for green light, then the cars will go away, the bikes will go away, you will get on the bike but that can be shaky. It is definitely a risk situation. As a motorist, you are very careful at all intersections. As motorists know you know that it is the priority to the right<sup>35</sup> that applies; you stop and look, seek eye contact. But it’s not that simple for a cyclist, I think.”

#### Own possibilities to avoid different risk situations

A8 believes that by adhering to traffic rules, she avoids potential risks when cycling. However, the bicycle paths sometimes create problems for her:

“It is difficult to know how to behave on the bike lanes. If there is right-hand traffic on the cycle path, it is important that everyone sticks to it. Otherwise it will be quite uncertain. Although the cycle path should be a safe way to cycle, it does not always feel that way.”

#### Alcohol and cycling

According to the A8, alcohol and cycling is a difficult issue. She describes her personal experience as follows:

“I never get drunk so I lose my balance. Clearly one or two glasses of wine is enough; you do not have the same reaction speed, of course. It has happened that I have cycled after drinking wine. There are many others who do so too. You shouldn’t cycle if you are drunk,

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<sup>35</sup> Priority to the right is a system, in which the driver of a vehicle is required to give way to vehicles approaching from the right at intersections. The system is stipulated in the Vienna Convention on Road Traffic for countries where traffic keeps to the right and applies to all situations where it is not overridden by priority signs (including uncontrolled intersections), including side roads and roundabouts (but not paths). The system is widely used in countries with right-hand traffic, including most European countries.  
Source: [www.wikipedia.com](http://www.wikipedia.com)

unsteady on your feet or sluggish and generally affected. When it is about smaller quantities of alcohol, it is a borderline case. But really, it's stupid to think so."

#### Obstacles to reducing the risk behaviour of older cyclists

According to A8, an obstacle to reducing the risk behaviour of older cyclists is that some people think that the such things are overplayed when one has reached older age. "You feel like you know already most things. It can be a resistance to absorbing updated information There is some resistance to change among people who are older than myself."

#### **A9: male, 72 years old**

##### Situations perceived as particularly dangerous when cycling

A9 believes that the priority to the right rule can cause problems if it is not followed or misunderstood at intersections:

"Some motorists do not really know the priority to the priority to the right rule that they should have. Some are stressed, unfocused, tired and in a hurry. As a cyclist, you have to look around properly. You should have a second plan or a spare thought in his head: Does he stop even if the priority to the right rule applies? Do I dare to trust on that? I always try to make eye contact with the driver I meet. I slow down, wave and get a signal that we agree about who should drive and who should not drive. I can wave to the motorist that he can drive. It's about being careful, to communicate, not to take anything for granted and to try to interpret the situation in several different ways. To reflect when arriving at an intersection."

Furthermore, A9 points out that risky situations often arise in the interaction with other cyclists on the cycle paths:

"It is risky because some cyclists, younger people in particular, often cycle in both directions at cycle paths even though there is an arrow in one direction. Some cyclists come very close and fast. The wider the bicycle path, the better it is of course."

##### Own possibilities to avoid different risk situations

To avoid accidents and incidents at intersections, according to the A9, it is important to take good time when coming to intersection. It is also important to have a good overview in order to be able to assess how the traffic is coming. One should avoid making too quick decisions.

"After an incident I had with a bus at an intersection, I have become extremely careful when I arrive at intersections by bike. I slow down. I look to the right and left. Anything can happen at intersections."

When A9 is cycling on a street with parked cars, he tries to cycle out into the street so that a motorist will be able to open the car door without causing an accident. "At any time, a reckless driver can open the door and get out of the car. Therefore I am careful. It's a matter of being conscious all the time."

According to A9, drivers can drive too close to cyclists on streets and roads. To attach an orange stick at the package holder would make drivers aware about the presence of the cyclist and thus help the drivers to keep the distance.

##### Alcohol and cycling

According to A9's assessment, it is quite generally accepted to cycle after a moderate alcohol consumption, despite the fact that it could be dangerous.

“Occasionally there are accidents with drunk people who fall. Poorer balance, poorer judgment, worse reactivity. You get blunted by alcohol. I used to ride a bike after being on wine tastings where quite a lot of wine was drunk. When I had been to a wine test, I cycled home through small forest roads but also on busy roads. I did not wear a helmet either. It is nothing that I am proud of today.”

A9 thinks that pensioners’ organizations could address the issue of alcohol and cycling. “People will not follow it to the letter, but it is worth pointing out. In the end, we want a safer society with more conscious road users.”

#### Obstacles to reducing the risk behaviour of older cyclists

According to A9, the main obstacle to reducing older cyclists’ risk behaviour is the power of habit. It can also have to do with laziness in some instances. “Or you do not care because you think it is so much pointers come from of society.” It is also possible, according to A9, that interesting angles of the subject are missing.

#### **A10: woman, 74 years old**

##### Situations perceived as particularly dangerous when cycling

A10 believes that intersections are unsafe and she has also had bad experiences there. “I think it’s good when there are light signals in the intersections so that I can feel safe when I cross an intersection.” Another problem for A10 are cyclists who do not show what they intend to do. “Cyclists are generally bad at giving signs. I think it’s important to show what you intend to do in the traffic. Other cyclists turn in front of my nose without giving a sign.”

##### Own possibilities to avoid different risk situations

When A10 is going to cycle somewhere, she thinks carefully about which way is the safest one. She avoids traffic environments where there is a risk that she will end up among buses and trucks. On streets where she does not feel safe she cycles on the sidewalk.

##### Alcohol and cycling

At some occasions, A10 has had a glass of wine and then cycled home.

“I would never take the car if I had some wine. If I drink a glass of wine I’d rather take the bike. But I do not get drunk and start cycling. If I would drink several glasses of wine, I would take the bus instead of the bike.”

#### **A11: woman, 65 years old**

##### Situations perceived as particularly dangerous when cycling

A11’s experience is that her interaction with other cyclists on the cycle paths is very complicated.

“It’s just as if some people think that if you sit on a bicycle you do not belong the traffic. People do not really understand that there is right-hand traffic even on the cycle paths. Many cyclists still cycle on the left side. They do not understand that the same rules apply as on the street. Many people drive fast on the bike paths. They often have headphones on the ears. They’re in their phone calls or something else. They trust that all others will handle the situation.”

##### Own possibilities to avoid different risk situations

When A11 uses her electric bicycle, she is extra careful at intersections.

“Sometimes you have to think in a different way at crossroads when using an electric bicycle. You have to slow down a bit. You have more control over the speed with a regular bike when you just pedal.”

**B1: male, 75 years old**

Situations perceived as particularly dangerous when cycling

B1 believes that it feels safe to cycle at intersections with a right angle (90 degrees) because it is possible to see the traffic coming from all directions. But in other types of intersections the vision may be impaired e.g. an intersection with an angle of 45 degrees. At such intersections, a vehicle may come obliquely from behind and it can be difficult to see it, especially if you are stiff in the neck and have difficulties to turn back. “I have cycled in places where it has been this way and felt uncertain then.” Furthermore, according to B1’s experience, an uneven ground constitutes a safety problem, for example gravel roads with potholes which makes it difficult to keep a straight course. It can lead to incidents with cyclists coming from behind.

Own possibilities to avoid different risk situations

B1 prefers to cycle a bit out into the roadway in mixed traffic. He then has better visibility, the cars slow down and keep a greater distance. If, on the other hand, he cycles close to the roadside, it leads to a different driving style from most of the motorists with higher speed and less distance.

Alcohol and cycling

“To drive a car home from a party is not ok. But cycling home can be considered ok according to the general opinion.” In B1’s view, it is up to the cyclist to decide whether or not to cycle after an event where alcohol was consumed.

“If I took a glass or two a few hours earlier and feel reasonably well, I could very well imagine cycling home if the traffic is not busy. I would cycle on small roads and similar places. It is probably a matter of judgment how you feel. A little common sense plays into this case.”

Information

B1 believes that the Swedish Transport Administration and others need to increase their information efforts directed to elderly cyclists to make them cycle more safely. The information should clearly explain why there is a need to change behaviour: “As a cyclist you have to understand why the information is given. If you have received information, you are mentally more prepared and it is easier time to avoid incidents. Information is never wrong.”

Obstacles to reducing the risk behaviors of older cyclists

According to B1, older cyclists need to realize their own limitations in order to become conscious about risks. Lack of insight into one’s own limitations constitute an obstacle for some cyclists. “But personally, I think most older people have enough experience to see the risks in different situations.”

**B2: woman, 80 years old**

Situations perceived as particularly dangerous when cycling

B2 feels unsafe at unattended pedestrian crossings. “There, people run like crazy.” According to B2, cycling in an unguarded intersection means keeping track of what rules apply in the intersection. “I give preference to all other road users when I come to a road or street intersection. I have to keep an eye on this. It’s just like when I drive a car.”

#### Own possibilities to avoid different risk situations

B2 only cycle on cycle paths. She cycles almost every weekday, between 30 and 90 minutes, to the gym, relatives and shops. She trains at a gym four days a week to keep her balance and strength. The training helps her maintain good balance and control when she rides a bike.

#### Alcohol and cycling

B2 believes that cycling with alcohol in the body can be equated with driving a car with alcohol in the body. If she has had wine on a visit to somebody, she does not cycle home but chooses to walk home or take the bus.

#### **B3: woman, 83 years old**

##### Situations perceived as particularly dangerous when cycling

B3 mentions a type of situation that she perceives to be particularly dangerous in the traffic viz. cyclists who are driving by her on the wrong side without using the bell.

“People are not using the bell. When I cycle in a bicycle tunnel under the railway I ring with the bell all the way so people can hear that I’m coming. I usually tell people who come by bike that they should use the bell. They always get annoyed.”

#### Own possibilities to avoid different risk situations

When B3 cycles on a bicycle path, she tries to cycle to the right as far as possible. She does in order to be sure that other cyclists cannot drive by her on the wrong side. She thinks that is threatening. “If the cyclist next to me do not ring the bell, then I am in danger.” Sometimes B3 cycles in the city streets in mixed traffic, but she does not like it. Rather than cycling at the nearest road among cars, she takes a detour to get to a bicycle path. At intersections without traffic lights, B3 always stops the bicycle and jumps off the saddle.

When she get off the bike, she leads the bicycle over intersections. When she starts cycling again, she lets other road users pass by so that she gets enough space if she should be unstable when she starts cycling. If B3 has cycled to the store and has bought a lot of goods, she usually leads the bicycle home. “If the bicycle basket becomes overcrowded so that I have to hang something on the bicycle handlebars, I usually I walk home with the bicycle. I do not want to expose myself to the risk of falling.”

#### Alcohol and cycling

According to B3, it may be necessary to introduce alcohol limits for cyclists in order to reduce the problem of cycling after alcohol consumption.

#### **B4: male, 76 years old**

##### Situations perceived as particularly dangerous when cycling

B4 has experienced several incidents in connection with cycling in roundabouts. At one occasion, heavy vehicles such as buses or cars with trailer did not wait while he was cycling through the roundabout. At the latest incident, B4 ended up near a bus that was drove too offensively. He had to turn to the side and ended up outside the actual roundabout. According to B4, motorists tend to leave too little space when driving by a cyclist. “It’s nasty when a big truck, 50 tonnes with car and trailer, drives fast and does not leave a real wiggle moon.” In some streets there is a pedestrian crossing next to a bicycle crossing. B4 is in favour obstacles which require cyclists to get off the bicycle and lead it across the street.

#### Alcohol and cycling

B4 has the same approach to cycling and alcohol as to drunk driving: Zero tolerance shall apply to alcohol in both cases. But according to B4, there is an acceptance among older cyclists to cycle after they have drunk one or two glasses of wine. B4 would welcome an alcohol limit for cyclists. "Since the police control car drivers, they could also control cyclists."

#### Obstacles to reducing the risk behavior of older cyclists

According to B4, many older cyclists seem to think that cycling is very easy and safe because they have been able to cycle ever since they were small children. "They are used to thinking that way."

#### **B5: male, 75 years old**

##### Situations perceived as particularly dangerous when cycling

According to B5, intersections can be problematic, even light-regulated intersections. One problem is that some motorists and cyclists are already driving when the lights change from red to orange. Such behaviour can lead to incidents, according to B5. He experiences a certain degree of insecurity in his interaction with heavier vehicles such as buses:

"It is more uncomfortable when a large vehicle is about to pass on a street than an ordinary car. Buses are bigger and wider and may not stay behind a bike if there is oncoming traffic but tries to push past. As a cyclist, you have nothing to oppose a bus. It is a complicated interaction. Once when I was cycling into town, a bus came by and pushed me up against the curb so I almost fell. The bus driver did it with sense and will. It was not a mistake or anything like that."

#### Alcohol and cycling

B5 does not consider the bicycle to be a lifeline after someone has consumed alcohol:

"It is said that you can take the bike instead of the car when you have had alcohol. That's not true. It is my firm principle. It may well be that you have had a beer somewhere and cycled home instead of taking the car. It's not the same as being drunk and cycling because that is completely wrong. There are different types of intoxication. It is also a question about your driving license. Many people do not want to take the risk of having a beer and failing in an alcohol test. But there is certainly a temptation to take the bike when you have been to a dinner and drank some wine."

According to B5, it is important that the pensioners' organizations address the issue of alcohol and cycling.

#### **B6: male, 81 years old**

##### Situations perceived as particularly dangerous when cycling

Several environments and situations in the traffic make B6 feel unsafe when he is cycling in the city. Some examples are the following:

- An unattended railway crossing where trains run rarely.
- An esplanade, where traffic goes in two directions at both sides of the street.
- "The situation when I shop for food. Then I have goods in the bicycle basket. When I shall cross a street, it is a bit risky because you take chances sometimes and want to cycle where you should not cycle. It can also be dangerous to get on the bicycle in that situation. You get unstable then because you have very heavy items in the basket. It can be dangerous."

- “Sometimes I pick up large packages with books at a mall. Then I must have the package on the package holder. Mostly I lead the bicycle all the way home but sometimes I cycle. It’s a bit of a risky situation, because I can get a little unstable if I have to stop quickly.”
- Cycling over busy streets where cars drive quite fast. It can be streets that are not so busy with cars but because they are not busy people drive faster than they usually do.
- The interaction with buses in the city center is complicated, according to B6: “I have to be careful when crossing streets there. I should not cycle too fast. I feel more insecure there.”

#### Own possibilities to avoid different risk situations

B6 sometimes lead the bicycle “because I think it’s safer.” He believes that when he leads the bicycle he has a better overview over the traffic situation. He does not cycle in roundabouts, “they are dangerous, they are special for cyclists.”

#### Alcohol and cycling

B6 thinks he can drink a few glasses of red wine and after that cycle home. He has seen cycling as an alternative to the car.

“You do not want to drive a car. Sometimes I have been invited to an acquaintance in another neighbourhood. I cycled home even though I had been drinking. I cycle when I have drunk, I do that. But not to such an extent that I lose my control. I ride carefully because I want to do not fall. Recently, I took the bus after drinking alcohol because I have discovered how good the bus connections are in the city.”

#### Obstacles to reducing the risk behavior of older cyclists

With regard to obstacles to reducing the risk behavior of the elderly, B6 emphasizes the importance of path dependence:

“When it comes to the elderly, it’s all about breaking habits. Some things do not disappear, e.g. to adjust the saddle height. It is also related to continue to act in the direction of the existing course. It depends on the habits you have. You are too narrowly focused on a certain behavior.”

### **Summary and conclusions**

From the interviews this chapter, it appears that cycling at *intersections* is an obvious risk environment for older cyclists. Crossings are considered to be both complicated and dangerous. Intersections with reduced visibility also creates insecurity. As A7 puts it: “Blurred visibility at road junctions where cars can come quickly requires extra attention.” At intersections in villages and smaller municipalities it is often the case that motor vehicles keep high speed and vehicle drivers are not always prepared for a cyclist suddenly appearing in the intersection. In A3’ words: “You have to be careful at the intersection. The speed limit has been lowered to 40 km/h in the village, but not everyone keeps 40.” Vehicles coming obliquely from behind at an intersection are particularly difficult to detect for older people with reduced mobility in the neck. Cycling at intersections is complicated by the fact that many of older cyclists have problems with control and balance when getting on and off the bicycle and making stops. Several of the interviewed cyclists have experienced a lack of balance and control the first few meters when they start cycling (see also chapter 6). On such occasions there is a risk that the cyclist may be hit by another vehicle. Some of the cyclists prefer to lead the bicycle across intersections in order to reduce the risk of an accident. For example, A1 used to feel insecure when she cycled through an intersection. Nowadays she gets off the bike and lead it through the intersection. She has noticed that there more motorists stop if they see that she is leading her bicycle. B3 always stops the bike at



intersections that lack traffic lights. She gets off the bike and leads it over the intersection. When she starts cycling again, she lets other road users go ahead so that she gets enough with space if she would have some balance problems when she starts cycling again. B6 states that he sometimes gets off the bicycle and lead it because it feels safer for him. Above all, he gets a better overview of the traffic. Older cyclists are particularly vulnerable in roundabouts. A4 notes that accidents have occurred in roundabouts where truck drivers have not seen the cyclist on the inside of them. B4 has experienced several incidents in connection with cycling in roundabouts related to heavy vehicles trying to get past. B6 states that he never rides in roundabouts because he thinks they are dangerous. "They are special for cyclists." By carefully planning his bicycle rides, A6 avoids cycling in roundabouts.

Cycling on *country roads* without access to a cycle path means a significant accident risk for cyclists. A4 has experienced that heavy vehicles such as trucks tend to come too close to him when he rides on narrow ways. The drivers do not show sufficient respect for the safety distance that should exist between cyclists and motor vehicles. Cycling on a country road without access to a cycle path causes great difficulties for A5: "When you hear a car coming at road bends, you have to go out into the roadside." According to A8, narrow and dark roads without cycle paths are very insecure: "When I cycle here in the countryside where I live, I feel quite uncomfortable. (...) The heavy vehicles make me cycle less."

*The priority to the right rule.* A4 points out that the general knowledge of the priority to the right rule is unsatisfactory, which creates problems at intersections. When A2 arrives at an intersection, he is careful and does not blindly trust the priority to the right rule:

"I do not just drive straight ahead just because I have the right to do it and the car is supposed to give me priority. I'd rather hold back and try to make eye contact. I'm not just driving out of the intersection. I'm too old for that. Over the years I have learned to be careful. I do not trust others because they may not see me. It does not matter who does wrong because it does exactly just as bad anyway. Rules are there to be followed but not everyone follows them for some reason. They do not see me. Or it could be for any reason. The car may not stop, may not give way and I have to be prepared for this. I cannot take things for granted."

According to A8, the priority to the right rule is more difficult for cyclists than motorists: "As a motorist, you know that it is the priority to the right rule that applies, you stop and look, you search eye contact. But it's not really that easy as a cyclist, I think."

According to A9, if the priority to the right rule is not followed or misunderstood, it will cause problems for cyclists:

"Some motorists do not really know the priority to the right rule that they should have. Some are stressed, unfocused, tired or in a hurry. As a cyclist, you have to look around properly. You should have a second plan or a spare thought in your head: does the car stop even if the priority to the right rule applies? Do I dare to trust it? I always try to make eye contact with the drivers. I slow down, wave and thereby get a green light that we agree about who should drive and who should not drive. It's about being careful, communicating, not taking anything for granted and to try to interpret in several different ways. Not be so sure but be critically reflective when arriving at an intersection or at all in traffic."

A general perception among the interviewed cyclists is that the interaction with other cyclists has a great potential for improvement. Younger cyclists usually cycle faster than older cyclists and often have small margins when they make overtakings on cycle paths. They rarely use the bell.

A majority of the cyclists interviewed declare that they sometimes have cycled after drinking *alcohol*. There seems to be a widespread acceptance of moderate drinking in connection with cycling. But there are also those who argue for countermeasures. For example, A4 advocates a broad information campaign on alcohol and cycling. Such an effort could possibly reduce the number of accidents.

## 8. Training for safer cycling

One way to meet the need for increased road safety for older cyclists could be to offer them training in safe cycling. An attempt to map the need for additional training efforts for safer cycling for the elderly was done in the framework of this study. Below is a summary of the answers received from 17 cyclists interviewed for this project.

**A1: woman, 68 years old**

“Training is needed about the risks of older cyclists. The more aware you become, the more you listen to the information.”

**A2: male, 73 years old**

“There should be training for older cyclists. It could be an association that arranges some kind of de-roasting exercises in the spring, just as has been done for motorcyclists in Sweden. A de-roasting exercise would mean that an expert talks safe cycling and controls that the bicycles complies with legal requirements. Training is definitely needed now when electric bikes are becoming popular. Electric bicycles are relatively fast.”

**A3: male, 69 years old**

“Training may be needed for older cyclists, but it is uncertain whether anyone would participate. The demand is probably not that great.”

**A4: male, 68 years old**

“There is nothing wrong with education for senior cyclists, as a large proportion of the elderly buy electrically assisted bicycle. You should be more aware that the older you get, the more problems there will be. One becomes weaker and it takes longer time to act and react. With the help of a battery the elderly can cycle at ever-increasing ages. Problems arise when you have time to see things, you have to have time brake and stop. There will be problems (...)”

**A5: woman, 73 years old**

“Of course, it would be good with education for older cyclists, but it sounds unrealistic to get older people to participate in a bicycle training. You grow up with cycling, it is a matter of course that you cycle, it is almost like walking. I think it’s hard to get into your head that you would need an education in order to cycle. Because it’s something you grow up with and something that goes by itself. But on the other hand, education could help discover that you may not actually be doing the best thing with your bicycle. I really think so. I would be affected. I’m affected by this conversation and realize that my cycling is not as good as it should be.”

**A6: male, 69 years old**

“I do not think that bicycle training is needed for the elderly.”

**A7: male, 69 years old**

“The need for training for older cyclists should not be exaggerated. How would training be conducted? It depends on how you set up the training, how it is all organized. People who do not normally think this is important are not reached. Hence, you only reach a small group of people. Without having to join the organization, such as the PRO etc., which does not have this road safety as

a daily issue. For exactly that reason when you have people who are not specialists and that is the important thing.”

**A8: woman, 68 years old**

“With all certainty, there is a need for training for older cyclists. It’s just a question of how to find the context, how to find the right tone and angle of approach. The need for training must come from the group itself that.”

**A9: male, 72 years old**

“Could a pensioners’ organization together with a traffic organization be able to have any training for older cyclists? You could try, but I do not know if people would be interested.”

**A10: woman, 74 years old**

According to A10, there is a group of elderly people who are afraid of cycling. A10 thinks they should be given an opportunity to practice cycling so they dare to cycle to a greater extent.

**A11: woman, 65 years old**

“Bicycle training is needed. When I went to school in the 1960s, every student at school had an annual bicycle training with a traffic police. Traffic rules were reviewed as well as appropriate behavior in different situations in the traffic. I think something similar should be tried today. There is a basic knowledge about traffic all people should be familiar with. Virtually all people are in the traffic even if they do not have a driving license. Everyone has obligations and rights, it is a team game.

**B1: male, 75 years old**

“The traffic intensity has increased which means that you have to look around in a different way today compared to earlier. There is a complicated relationship between cyclists and motorists. Cyclists create their own traffic rules that are adjusted to their own needs. An example is that many cyclists believe that the same rules apply to them as to pedestrians at pedestrian crossings. Some form of a driving license for cyclists is conceivable.”

**B2: woman, 80 years old**

“There are a lot of rules but few cyclists know all the rules. Few cyclists know that they should stop at an unattended pedestrian crossing and give way to the pedestrians. All cyclists need to be updated about the rules. Road users must to become better at respecting each other.”

**B3: woman, 83 years old**

“At gatherings for elderly, it could be mentioned that there are lecturers who can talk about cycling. Someone could come and talk about safe cycling in traffic in connection with annual meetings. People are quite willing to discuss.”

**B4: male, 76 years old**

“Training and information about risk situations in traffic as a cyclist would have been good. It would be good if pensioners’ associations could be offered training so that they could keep up with this themselves. They usually have road safety delegates. Then you could get help from municipalities and NTF. On some streets with traffic lights there are bicycle boxes where cyclists can stand in front of the vehicles while waiting for the green light. Knowledge about bicycle boxes could be included in the education for older cyclists. Second, there are many cyclists who do not know that while the cars are stationary, the cyclists should cycle past the cars and stand in front of the bicycle box to avoid the problem of ending up dead the angle of a right-turning vehicle and get pinched. It’s so easy to squeeze someone. You do not turn your head and look at what is in the blind spot. It is also

important for cyclists to learn more about the dead angle to understand how little a bus driver sees when cyclists are in the dead angle.”

**B5: male, 75 years old**

“Information and training are needed to increase the awareness about different types of situations and what can happen when cycling. This applies not only to cyclists. Also other road users need to increase their awareness about cyclists in traffic. Motorists and bus drivers should not drive too close to the cyclists. They need to increase their understanding of how cyclists can react in certain situations.”

**B6: male, 82 years old**

“I do not think education is needed. It would be better to offer information via already available channels. I usually watch TV programmes about health issues. If there was such a thing about cycling, I would look at it. It’s so easily accessible via TV. I’m interested in television education. TV shows are something that older people talk about.”

## **Discussion and conclusions**

The interviews showed that thirteen of the seventeen older cyclists would welcome the opportunity for older cyclists to be able to participate in training about safe cycling. Arguments given for this position include the following:

- There is a low awareness about potential risk situations and how these could be handled. For example, knowledge needs to increase about the dead angle and how to behave in a bicycle box.
- There is a need for practical exercises about how to manage risk situations in the bicycle traffic.
- If given the opportunity to practice cycling in a safe way, more elderly people would dare to cycle and/or be able to cycle longer.
- Training for senior cyclists is important as more and more elderly people use electric bicycles.
- Training corresponding to a driving license training may be needed because “the traffic intensity has increased, (...) you have to look around in a different way today compared to before.”

There are also arguments put forward *against* training for older cyclists. One objection is the difficulty to a wider group of cyclists. One of the cyclists put forward the opinion that an alternative to training could be to offer TV programmes about older cyclists’ safety.

Bicycle education can contribute to the achievement of several important goals at the same time: More older people would dare and/or be able to get started cycling and more older people could cycle longer in a safer way.

NTF has a long tradition of arranging traffic safety training for seniors. In 2017, NTF completed road safety training for traffic delegates from the three largest pensioners’ organizations in Sweden: PRO, SKPF Pensionärerna and SPF Seniorerna.<sup>36</sup> Annually has about 600 people educated in 2019 led to many meetings and study circles. The traffic delegates have informed approximately 30,000 people in various local associations in the country. According to Katarina Bokström, project manager at NTF, bicycle safety has been an integral part of the training.

“When it comes to the bicycle as a vehicle, we have emphasized the use of a bicycle with low

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<sup>36</sup> Three other organizations for pensioners – RPG, Lärarnas pensionärsförening and Visions pensionärsförening – also have participated in certain places (interview with Lars-Eric Abrahamsson, project manager, NTF, 2020).

entry. The importance of wearing a bicycle helmet has also been addressed. The education has not addressed particular risk environments in the traffic (such as intersections). Alcohol and cycling have not been addressed because we believe that drunk driving is a bigger problem and a bigger risk.”<sup>37</sup>

The courses have also addressed the importance of using studded tires in connection with winter cycling and to be extra careful with cycling in early spring as there may be both gravel and ice stains at the cycle paths.<sup>38</sup> Katarina Bokström believes that NTF’s approach constitute an effective way of communicating road safety.

“I believe in our method which means that we have some people to whom we provide extra information and feel selected. We believe that older people best pass on the information to other people in the same age. That way of working is better in terms of quality and resources than if NTF would travel around the country and talk about road safety in all pensioners’ organizations. Our current working methods disseminate information effectively and provide long-term results.”<sup>39</sup>

Based on what emerged from this study, the conclusion is that there is a substantial interest in training and education about increased safe cycling for people over the age of 65 with a mixture of theoretical knowledge and practical training. Such a training could include the following elements:

1. The importance of cycling: health, environment and quality of life. Road safety and vulnerability of the elderly: statistics, most common accidents and most common injuries.
2. Control and balance: entry, seat height, setting of the correct seat height, getting on and off, start and stop, balance and control during the ride. The different conditions for men and women. Balance test and balance training.
3. Helmet and other protective equipment. Visibility. Winter cycling.
4. Risk situations: intersections, the priority to the right rule, the blind spot, etc. Interaction with others road users. Practical exercises in the traffic environment.
5. Choosing a bicycle: What to think about? Which bikes are there to choose from? How long can/should one continue to cycle?
6. Simple knowledge test. Feedback. Evaluation.

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<sup>37</sup> Interview with Katarina Bokström, project manager at NTF, 2020.

<sup>38</sup> Interview with Lars-Eric Abrahamsson, project manager, NTF, 2020.

<sup>39</sup> Interview with Katarina Bokström, project manager at NTF, 2020.

## 9. Cyclists thoughts about their future cycling

In this concluding chapter, the 17 older cyclists present their thoughts about how long they estimate to continue to cycle. They also discuss possible reasons for them to give up cycling.

**Table 9.1. Cyclists thoughts about their future cycling. Group A, 65-74.**

Cyclist	Gender	Age	How long do you think you will be able to cycle?	For what reasons would you be forced to give up cycling?	Comment
A1	Woman	68	"Ten more years."	"Dizziness. Accessibility to cycle paths and quiet roads where I can cycle."	
A2	Man	73	"To 80."	"Injuries. Disease." <sup>40</sup>	
A3	Man	69	"To at least 80."	"Serious traffic accident."	
A4	Man	68	"Longer than 80 years of age."	"Physical barriers. Balance."	
A5	Woman	73	"As long as possible."	"Serious disease. Fracture."	
A6	Man	69	"Five more years at least, to 75."	"That I cannot observe other road users and vehicles. That I will be more unstable and begin to sway."	
A7	Man	69	"No clue."	"Impaired balance or other physical impairment."	
A8	Woman	68	"As long as possible."	"Until I feel (or someone tells me) that it is risky for me to cycle. E.g. if I suffer from dizziness or poor balance. Or other physically limiting disease. Or if I suffer from dementia so that I loose orientation."	
A9	Man	72	"Preferably to 100."	"Balance problems. Illness: stroke, severe heart disease."	
A10	Woman	74	"To about 80."	"Balance problems."	"My balance has deteriorated during the past year."
A11	Woman	65	"Long time."	"Poor eyesight. Dizziness."	"I do not exclude buying a three-wheeled bicycle."

<sup>40</sup> A2 develops his answer as follows: "With old age we react slower, we see a little worse, we hear a little worse. We can compensate for this through our experience and routine. But at some moment it is no longer possible to compensate and I become a more dangerous driver. The limit depends on the person, it can be a little different. Beyond the age of 80 we may not be suitable to be drivers. This also applies to cyclists. Everything gets worse. Not just this with the eyes and ears but also the balance. Attention. Reactivity. Decision-making."

**Table 9.2. Cyclists' thoughts about their future cycling. Group B, 75-.**

Cyclist	Gender	Age	How long do you think you will be able to cycle?	For what reasons would you be forced to give up cycling?	Comment
B1	Man	75	"Ten more years, to 85."	"When I feel I'm not in control of the situation due to balance problems, have less mobility and not enough observant."	
B2	Woman	80	"As long as I'm so vital as I am today."	"That I would become unstable. That sight becomes bad. Eventually age."	
B3	Woman	83	"As long as I do have a good balance."	"Balance difficulties. Visual problems. Other causes that come with increasing age."	
B4	Man	76	"To 85."	"Disease."	
B5	Man	75	"As long as I can."	"Depending mainly on my physical health and perhaps also mental health."	
B6	Man	82	"The goal is to cycle to 85 years."	"Increased shakiness."	
Total					

## Conclusions

Four of seventeen interviewed older cyclists stated that they hope to be able to cycle until they are 85 years old or even longer. Ten cyclists believe that balance problems and increased instability are probable reasons why they will be forced to stop cycling in the future. Four cyclists believe that visual impairment may force them to stop cycling. Two cyclists mention psychological factors, such as dementia, as possible reasons for giving up cycling.

According to one cyclist, the lack of accessibility to cycle paths and quiet streets is a potential reason for ending cycling. Another cyclist indicates an interest in switching to a three-wheeled bicycle.

In previous studies on older cyclists, 75 years of age has been identified to be the age at which many older people decide to give up cycling.<sup>41</sup> However, most the cyclists interviewed for this project declared that they intend to cycle significantly longer. It is noteworthy that none of the cyclists interviewed stated increased physical vulnerability or fragility as a contributing factor to stopping cycling. It is thus not the risk of injury but the increased the risk of accidents that is the deciding factor for the decision to stop cycling.

<sup>41</sup> For example, Rosenkvist et al., 2013.

## 10. Conclusions and recommendations

Older cyclists, ie. cyclists at the age of 65-, is not a homogeneous group of cyclists. There are advanced exercise cyclists who cycle longer distances as well as everyday cyclists who cycle shorter distances to perform necessary daily affairs. Some of the interviewed older cyclists have experienced more accidents than the others. Some of their accidents could be seen as the result of an offensive driving style or a certain degree of risk-taking. The study showed that some older cyclists are better at adopting safety measures than the others. In previous studies on older cyclists, the age of 75 has been identified to be an age at which many cyclists decide to stop cycling. However, most of the cyclists interviewed for this project indicated that they have an intention to continue cycling significantly longer beyond the age of 65. It is noteworthy that none of the interviewed cyclists referred to increased physical vulnerability as a reason to stop cycling. It is the increased risk of accidents rather than that increased bodily fragility which is perceived as the decisive factor for their future cycling.

Regarding the use of bicycle helmet, it can be concluded that older exercise cyclists seem to have a higher degree of helmet use than the everyday cyclists. The former cycle faster and much longer distances which seem to increase the use of helmets. Older everyday cyclists who do not wear a helmet explains that the power of habit is great and the helmet affects the hairstyle in a negative way. This is a particularly common argument among female cyclists. Everyday cyclists who wear helmets refer to the importance of the power of habit as well as the experience of an accident, one's own or a close relatives' misfortune.

The bicycles used by the interviewed cyclists are usually in a good condition. The biggest problems with the bikes are said to be too high saddle height (mainly women) and too high entry (mainly men). Both of these problems increase the risk of accidents in connection with on and off boarding. Excessive saddle height also leads to balance problems at the very beginning of the bicycle ride as well as problems with control and balance during the journey.

A minority of the 17 cyclists interviewed cycle in winter. Not all of the winter cyclists use winter tires. In terms of risk situations, the interviewed cyclists believe that cycling at intersections is both complicated and dangerous. Examples are intersections with obscured visibility and intersections where connecting vehicles comes obliquely from behind. Balance problems at intersections, e.g. in connection with boarding and alighting, entails increased risk for collisions.

A majority of the cyclists interviewed state that they have cycled after drinking alcohol. There is an overall an acceptance for moderate drinking in connection with cycling.

The study results in three overall conclusions. *First*, older cyclists have a significant potential to influence their safety in the traffic by taking a number of rather simple measures. This study identified 22 such measures (see below). *Second*, among the cyclists interviewed there is an interest in education and information on how the elderly's cycling can be made safer. Retirement organizations, including their local associations, are possible platforms for training and information efforts. Based on what has emerged in this study, there seems to be an interest in education where theoretical knowledge is combined with practical training. Distance education could be developed. Education can make use of experiences from the traffic safety training that NTF and the three leading pensioners' organizations have arranged annually for the approximately 600 so-called traffic delegates who have been appointed within these organizations. Possible elements of an education about increased safe cycling could include the following:

1. The importance of cycling: health, environmental aspects and quality of life. Road safety and vulnerability of the elderly: road safety statistics, common accidents and injuries.
2. Control and balance: entry, seat height, setting of the correct seat height, getting on and off the bicycle, stopping and start, balance problems. Different preconditions for men and women. Balance test and balance training.



3. Helmet and other types of protective equipment. Visibility. Winter cycling.
4. Management of risk situations: intersections, the priority to the right rule, the blind spot, etc. Interaction with others road users. Practical exercises in the traffic environment.
5. Choosing bicycle: What to think about? Which bicycles are there to choose from? How long can/ should you cycle?
6. Simple knowledge test. Feedback. Evaluation.

*Third*, in order to promote the safety of older cyclists in the long term, a systematic knowledge building about older cyclists way of handling various aspects of their cycling, such as boarding, disembarkation, stops, balance and control, falls from the bicycle and cycling at intersections. It is also important to map older cyclists' alcohol habits in connection with cycling. Knowledge needs to increase about situations that may lead to accidents. There is a need for increased knowledge about what factors deter older cyclists from cycling and what can be done to get more older cyclists to cycle longer without compromising their safety. Improved knowledge about the elderly's cycling means that policy-makers are given an improved basis for determining which safety measures should be given priority.

#### *Recommendations*

This study results in 22 recommendations for older cyclists that are about measures they can undertake to protect themselves in the traffic:

#### Accident prevention measures:

1. To try to avoid cycling at intersections without traffic lights.
2. Not to blindly trust the priority to the right rule at intersections. *Never take a chance and never take anything for granted.*
3. To ensure that you as a cyclist have free surfaces around you when you start cycling, e.g. by a crossing. Problems with balance and control is common the first meters of cycling.
4. To be aware of the danger of falling into the blind spot near motor vehicles, e.g. at intersections.
5. Try to lead the bike on passages that are unsafe.
6. Try to avoid cycling in roundabouts.
7. To plan the bike ride on the safest road, even if it is not equal to the nearest road.
8. To improve visibility, even at dawn and dusk.
9. To always use winter tires in connection with winter cycling.
10. To use the bell in the traffic to improve the interaction with other road users, e.g. on cycle paths and at intersections.
11. To always use bicycles with low entry.
12. To lower the saddle height so that the cyclist can *always* have ground contact with your feet when sitting on the saddle.
13. When buying a bicycle, to choose a type of bicycle of the right size which enables the saddle height to be lowered enough.
14. In case of balance problems, to consider using a bicycle with three wheels.

#### Injury prevention measures:

15. To always wear a bicycle helmet, also at shorter distances. Keep the helmet close at hand!
16. Use other protective equipment for knees, hips, elbows, hands etc.

#### General measures:

17. To always abstain from alcohol in connection with cycling.
18. To ask for a balance analysis, for example in connection with health checks.
19. To regularly train balance and strength.
20. To participate in education and training on safe cycling if available.
21. To be aware of the fact that the risks (accident risks, vulnerability) of older cyclists increase markedly after approximately 75 years of age.

22. To plan and prepare for the last cycle tour rather than stopping cycling because of an accident or a serious incident.

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### Statistical material:

Strada statistics report. Date for statistics collection: 2020-06-04.

Road user category: Bicycle. Age: 65-.

Damage rate: Dead. Severely damaged. Moderately damaged. Slightly damaged.

Date: 2015-01-01 - 2019-12-31

Strada statistics report. Date for statistics collection: 2020-06-04.

Road user category: Bicycle.

Damage rate: Dead. Severely damaged. Moderately damaged. Slightly damaged.

Date: 2015-01-01 - 2019-12-31

### Internet:

[www.cajomaconsulting.se](http://www.cajomaconsulting.se)

[www.horselslingan.se](http://www.horselslingan.se)

[www.trafikverket.se](http://www.trafikverket.se)

[www.wikipedia.org](http://www.wikipedia.org)

## Appendix 1. List of interviewees

Telephone interviews were conducted with 17 elderly cyclists resident in four municipalities in Sweden: Gothenburg, Halmstad, Uppsala and Växjö. The interviewees have been anonymized.

### Group A, 65-74:

- A1: Woman, 68 years old, Gothenburg. Telephone interview 2020-03-05.
- A2: Male, 73 years old, Växjö. Telephone interview 2020-01-24.
- A3: Male, 69 years old, Växjö. Telephone interview 2020-01-22.
- A4: Male, 68 years old, Växjö. Telephone interview 2020-01-23.
- A5: Woman, 73 years old, Uppsala. Telephone interview 2020-01-21.
- A6: Male, 69 years old, Uppsala. Telephone interview 2020-01-13.
- A7: Male, 69 years old, Uppsala. Telephone interview 2020-01-10.
- A8: Woman, 68 years old, Uppsala. Telephone interview 2020-01-10.
- A9: Male, 72 years old, Uppsala. Telephone interview 2020-01-09.
- A10: Woman 74 years old, Uppsala. Telephone interview 2020-01-09.
- A11: Woman, 65 years old, Halmstad. Telephone interview 2020-01-07.

### Group B. 75 and older

- B1: Male, 75 years old, Gothenburg. Telephone interview 2020-03-05.
- B2: Woman, 80 years old, Gothenburg. Telephone interview 2020-03-04.
- B3: Woman, 83 years old, Uppsala. Telephone interview 2020-01-28.
- B4: Male, 76 years old, Växjö. Telephone interview 2020-01-22.
- B5: Male, 75 years old, Uppsala. Telephone interview 2020-01-10.
- B6: Male, 82 years old, Uppsala. Telephone interview 2020-01-09.

### Other interviews:

In addition, six interviews were conducted with road safety experts. These were:

- Lars-Eric Abrahamsson, project manager for the elderly project, NTF Gävleborg, 2020-03-06.
- Mari-Anne Andersson, Chair, Traffic and Safety Committee, SKPF Pensionärerna, 2020-03-11.
- Ulf Björnstig, Professor of Surgery, Umeå University, 2020-03-04.
- Katarina Bokström, project manager, NTF, 2020-03-10.
- Maria Krafft, director, Swedish Transport Administration, 2020-03-16.
- Krister Spolander, bicycle and traffic safety consultant, 2019-02-20 and June 2020.

### Supplementary interview:

- Per Leimar, Drug Policy Department, IOGT-NTO, Stockholm, 2020-05-26.

## Appendix 2. Interview guide

The following orientation questions were used in the telephone interviews with the older cyclists.

Introductory questions:

- How often and how far do you usually cycle?
- Have you been involved in a bicycle accident? What happened? What injuries were there?
- Could you have done something yourself to avoid your accidents and to reduce injuries?
- How long do you think you will be able to continue cycling?
- What factors will determine when you decide to stop cycling?

### 1. Bicycle helmet

- Do you wear a helmet? If yes, why? If no, why not?
- What prevents you from wearing a helmet?
- On what occasions do you not wear a helmet?
- What is your knowledge of the importance of the helmet to protect the head?
- Have you received information about bicycle helmets? If yes, from where?
- Would you like more information about bicycle helmets? If so, what type of information?
- What can municipalities, regions, the Swedish Transport Administration, NTF and Cykelfrämjandet and other organizations do in order to get more elderly cyclists to increase their helmet use?
- What can be done by pensioners' organizations and other organizations to increase the use of helmets among their members?
- What are the general obstacles for increased helmet use among older cyclists?

### 2. The bicycle

- How old is your bicycle?
- Have you had a bicycle accident or incident that can be related to some kind of fault with your bicycle? What happened?
- How often is the status of your bicycle checked by a professional bicycle dealer/repairer? What is stopping you from making more frequent checks?
- Do you talk to your bicycle dealer/repairer about the status of the bicycle?
- How do you experience getting on and off the bicycle in connection with cycling?
- How do you view the saddle height in relation to control, balance and fall height?
- Does your bicycle have a bell? Do you use a bell when cycling?
- Does your bicycle have front and rear lighting?
- Do you turn on the lights when cycling in: a. dawn b. dusk c. darkness
- Do you cycle in the winter? If so, do you use studded tires?
- Have you received information about safety-related issues related to the bicycle?
- Do you want more information about the bicycle? If so, what kind of information would you like to have about the bicycle? Where could that information come from?
- Can you do something yourself to get a safer bike?
- What obstacles are there for you to improve the safety of your bicycle?
- What should be done by municipalities, regions, the Swedish Transport Administration, NTF and Cykelfrämjandet and other organizations to get more older cyclists to use safer bicycles?
- What can be done by pensioners' organizations and other organizations to get more of their members to use safer bicycles?

### 3. Risk situations

- Do you have an experience of accidents and incidents? If so, what happened? How often has this happened? Were you injured?
- What can you do yourself to avoid different risk situations?
- Where and when do you feel unsafe in traffic when cycling? How often do you feel insecure?
- Which situations in the traffic do you find to be particularly dangerous?
- Do you have your own experience of accidents and incidents at *intersections*? If so, what happened? How often has it occurred? What can you do yourself to avoid such risky situations?
- Do you have your own experience of accidents and incidents in the vicinity of *heavy vehicles*? If so, what happened? How often has it happened? What can you do yourself to avoid such risky situations?
- Do you have your own experience of accidents and incidents on a *cycle path*? If so, what happened? How often has it occurred? What can you do yourself to avoid such risky situations?
- Do you have your own experience of accidents and incidents when cycling on *country roads*? If yes, what happened? How often has this happened? What can you do yourself to avoid such risky situations?
- Do you have your own experience of accidents and incidents when cycling on *city streets*? If yes what happened? How often has this happened? What can you do yourself to avoid such risky situations?
- Do you have your own experience of accidents and incidents in connection with getting on and off the bicycle?
- Do you have experience of accidents and incidents in connection with stops?
- What is your general view about consumption of alcohol in connection with cycling? What is your personal experience?
- Would you be interested in more information about dealing with risky situations for cyclists?
- Who could pass this information on to you?
- What can be done by municipalities, regions, the Swedish Transport Administration, NTF and Cykelfrämjandet and other organizations in order to increase risk awareness among elderly cyclists?
- What can be done by pensioners' organizations to increase older cyclists' risk awareness?
- What are the obstacles for increasing older cyclists' risk awareness?

### Other questions:

- Do you use a reflective vest when cycling?
- Do you use reflectors on your clothes when cycling?
- Do you use any form of protective equipment when cycling?
- Is there a need for training about safer cycling for the elderly cyclists? Motivate your answer.

## **Older cyclists' views on their own possibilities to improve their safety**

**Magnus Andersson**

During the period 2015-2019, 105 cyclists died in Sweden. Of these, 61 cyclists were over 65, which corresponds to 58 per cent of all cyclists killed. The project "Older cyclists views on their own possibilities to improve their safety" was conducted in 2020 by road safety consultant Magnus Andersson, Cajoma Consulting, Sweden. The project was based on a literature review and 17 interviews with cyclists between 65 and 83 years of age. The project focused on three areas: bicycle helmet use, bicycle status and risk situations in the traffic.

The study contains 22 *recommendations* directed to older cyclists. Among these recommendations are the following: To always use a bicycle helmet, even at shorter distances. To always abstain from alcohol in connection with cycling. To try to avoid cycling at intersections without traffic lights. Not to blindly trust the priority to the right rule at intersections. To try to lead the bike at passages that are perceived to be unsafe. To look safest way to cycle even if it is not equal to the nearest way. To lower the saddle height so that the cyclist can *always* have ground contact with the feet when sitting on the saddle. When buying a bicycle, to choose a type of bicycle of the right size and which enables the saddle height to be lowered sufficiently. To make a balance analysis in connection with health checks.

The study was funded by Skyltfonden at the Swedish Transport Administration.

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