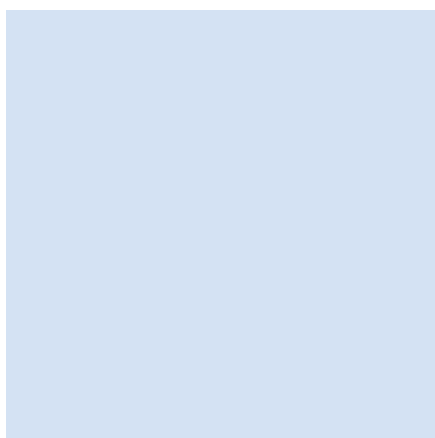


# E-Bike Repair Study 2020

by WERTGARANTIE



1963 SINCE  
Made in Germany



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## Dear readers,

More and more consumers are opting for a bike with an electric motor that promises comfort and effortless mobility. Whether due to the purchase price or in terms of longevity, many users take measures to protect their e-bikes from damage, with a large part of these protective measures going towards securing the bike against theft. As we were able to establish in this study, theft only accounts for 4.1 per cent of the damage to e-bikes. In fact, technical defects and accidents are the main cause of damage. There were further surprising findings, in particular with regard to the accident-related damage: the accident frequency for users over 60 years is negligible at 3.7 per cent. Specifically, it is the group of e-bikers under the age of 40, which is responsible for almost three quarters of the accident-related damage.

With the e-bike repair index and the associated repair study\*, WERTGARANTIE provides comprehensive information on the susceptibility to damage and repair costs of selected e-bikes and brands. In addition, we present user-based findings on damage prevention, repurchase probability, repair and usage behaviour of different age groups, and on the frequency of damage in the individual federal states.

We hope you will enjoy this study!

A handwritten signature in blue ink that reads "Brandt".

Marco Brandt  
Division Manager Digital Business

\* The basis of this study is a representative survey of 1,714 participants aged 18 years and over conducted in cooperation with Statista. The survey period was between 6 August – 29 August 2019. The results of the survey and the e-bikes/pedelecs insured by WERTGARANTIE provided the data on which the Repair Index is based.

Repair index:

# The e-bike ranking

Several e-bike manufacturers were able to assert themselves here: Velo de Ville scores well in all categories and is in first place in the overall rating. The Macina Cross Pro 10 from KTM also achieves top marks in terms of low need for repairs and affordable repair costs. Kalkhoff Agattu i8r advance is also convincing.

Some e-bikes by Bulls, Haibike and Trek do less well. Three Bulls models are rated as particularly susceptible to repairs regardless of the area of application; Haibike is among the worst 5 with Sduro HardNine 7.0 and Sduro Trekking 3.0. Least well placed overall: Trek Powerfly 7 and Stevens E-Capriole.

The Repair Index assesses the susceptibility to damage of various e-bikes and the repair costs that arise in the case of damage. For this e-bike ranking, scores from 1.0 (best) to 4.0 (worst) are awarded quarterly. This is based on the e-bikes/pedelects insured by WERTGARANTIE. The ranking is updated each quarter, so the figures online always represent the latest ones.

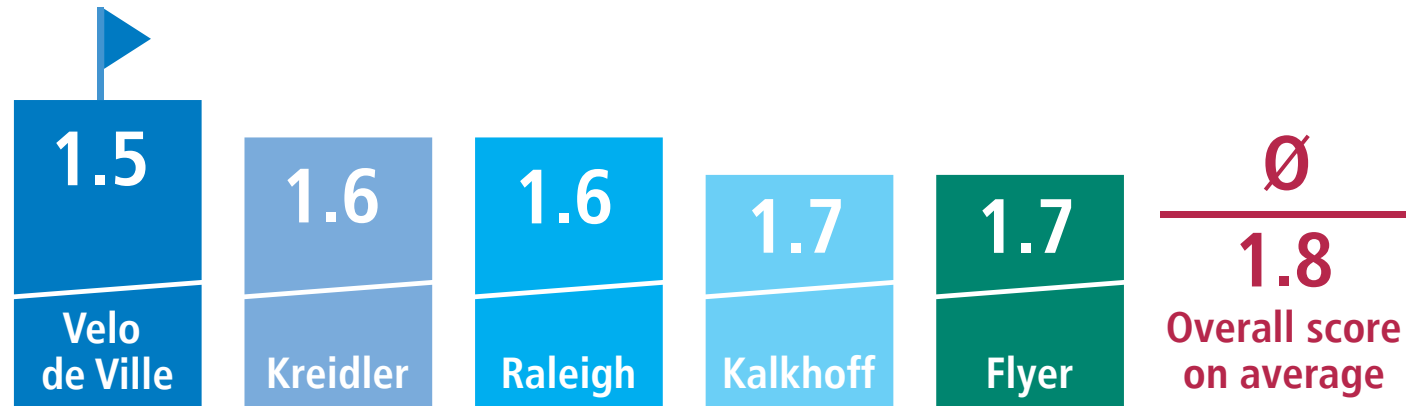
As per: Q1/2020

\* E-bikes/pedelects insured by WERTGARANTIE serve as a basis for the data.

Overall score of the five best manufacturers\*

Velo de Ville wins by a nose

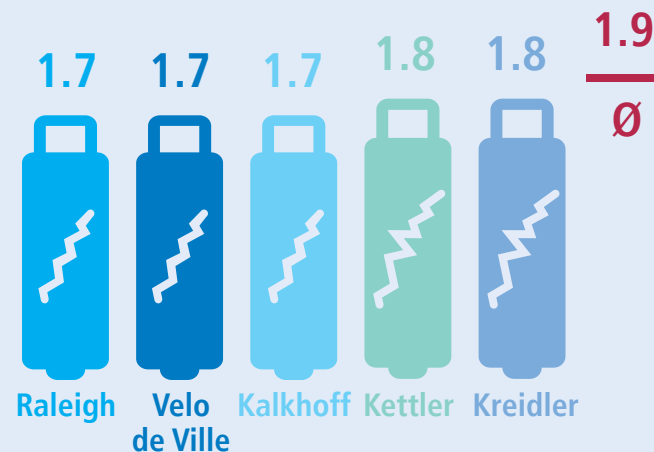
Head-to-head race: Velo de Ville takes the top spot with a score of 1.5, while Flyer is in 5<sup>th</sup> place with 1.7.



Need for repairs of the five best manufacturers\*

These brands are extremely robust

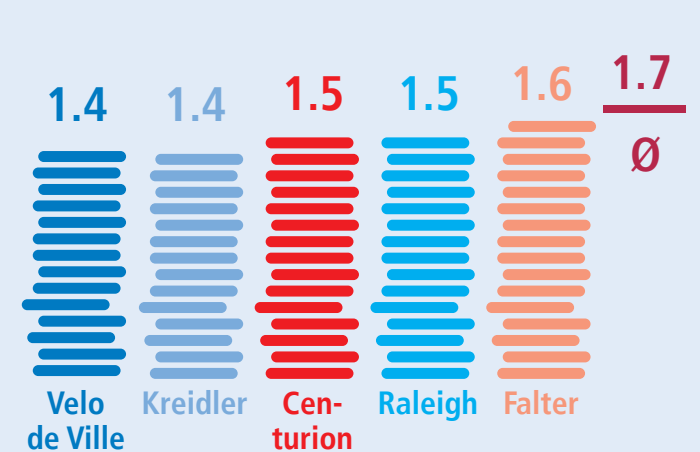
Raleigh, Velo de Ville and Kalkhoff share first place; Kettler and Kreidler do almost as well with a score of 1.8.



Repair costs of the five best manufacturers\*

Only slight differences in costs

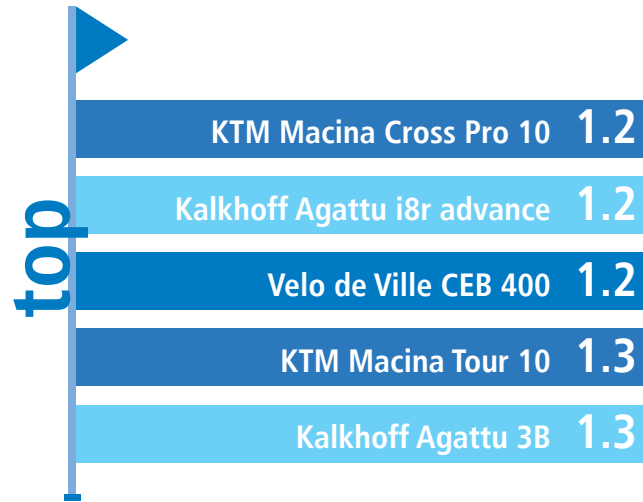
E-bikes by Velo de Ville and Kreidler again score high with 1.4. Centurion, Raleigh and Falter are hot on their (w)heels.



Tops and Flops of e-bikes: Overall score

## Tailwind for KTM and Kalkhoff

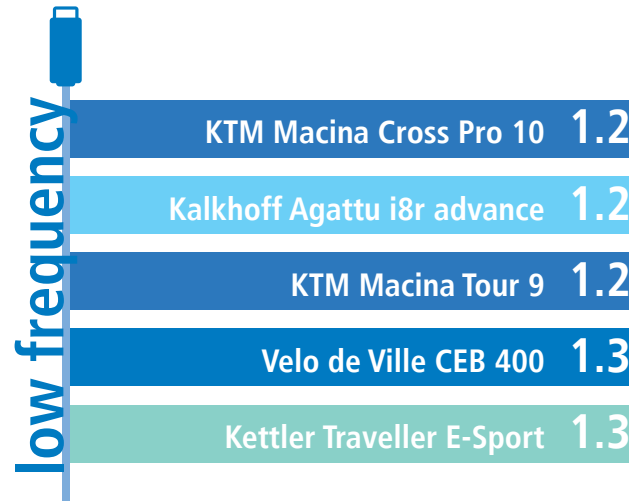
Both companies place two models in the top 5, Trek only makes it into the flop 5 with Powerfly 7 and Powerfly ES7.



Tops and Flops: Repair frequency

## Top marks for KTM and Kalkhoff again

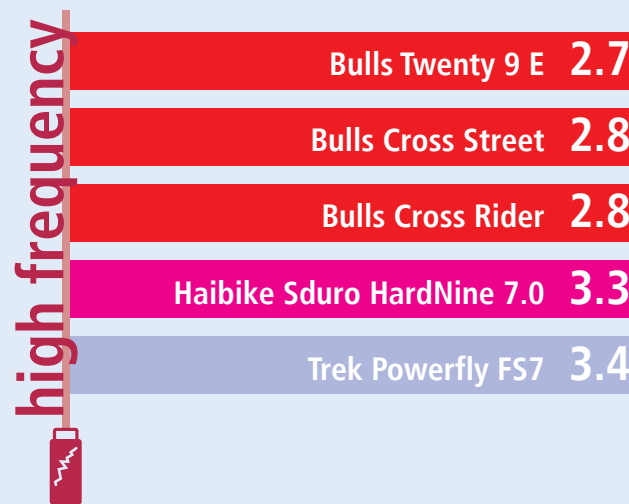
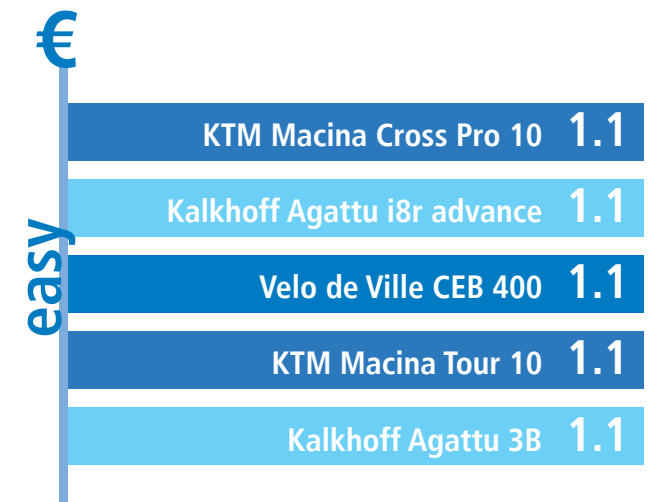
Kettler Traveler E-Sport and Velo de Ville CEB 400 (score of 1.3) also prove stable. Bulls is less convincing with three e-bikes in the flop 5.



Tops and Flops: Repair costs

## Top five of the lowest cost

Models by KTM, Kalkhoff and Velo de Ville have particularly low repair costs. Bottom of the list: Trek Powerfly 7 and Stevens E-Caprile.



▶ As per: Q1/2020

Damage facts:

# The most frequent causes of damage

Every fifth damage to e-bikes is due to technical problems, with the battery and motor being particularly affected. This could be caused by improper handling, unsuccessful self-repair or lack of maintenance. However, at 27.1 per cent, displays also have surprisingly large technical impairments, which may indicate display quality defects in cheap e-bikes.

At 15.8 per cent, accidents are another important cause of damage, which has a major impact on the battery, stems and motor. In the case of batteries in particular, it is often recommended that they be replaced as a precaution after accidents in order to prevent serious long-term consequences such as spontaneous combustion.

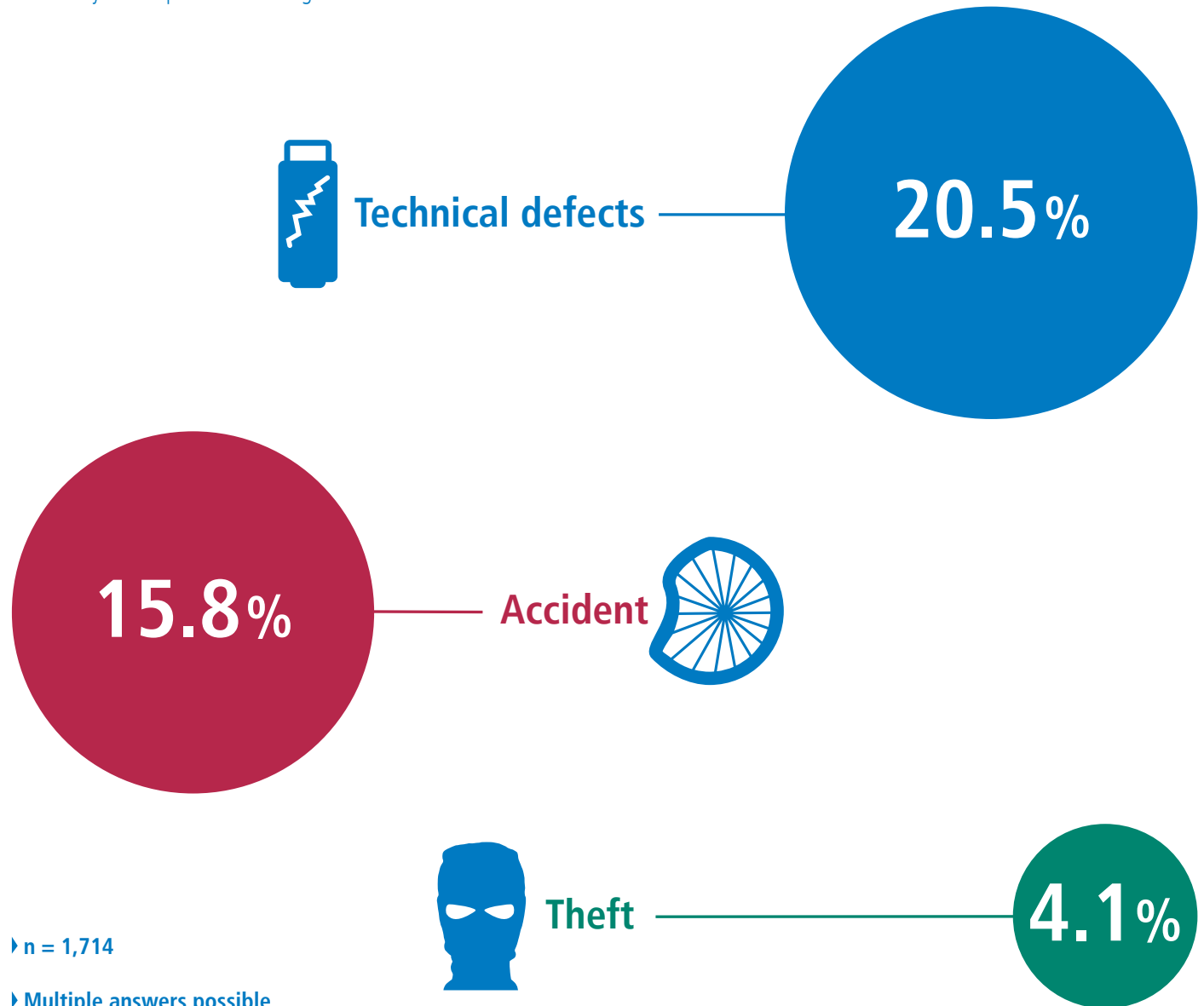
Surprisingly, thefts are at the bottom of the scale with 4.1 per cent. Protective measures against technical and accidental damage are therefore more important than protection against theft. In the event of theft, by the way, e-bike components are stolen in approximately 45 per cent of the cases – almost as often as entire e-bikes. So it makes sense to effectively secure and protect components such as the battery as well.

▶ **How to protect your bike:**  
bike locks, coding, insurance

Causes of e-bike damage

## No. 1 Source of damage: technical problems

Damage is mainly due to technical problems, followed by accidents. Thefts only make up 4.1% of damages.



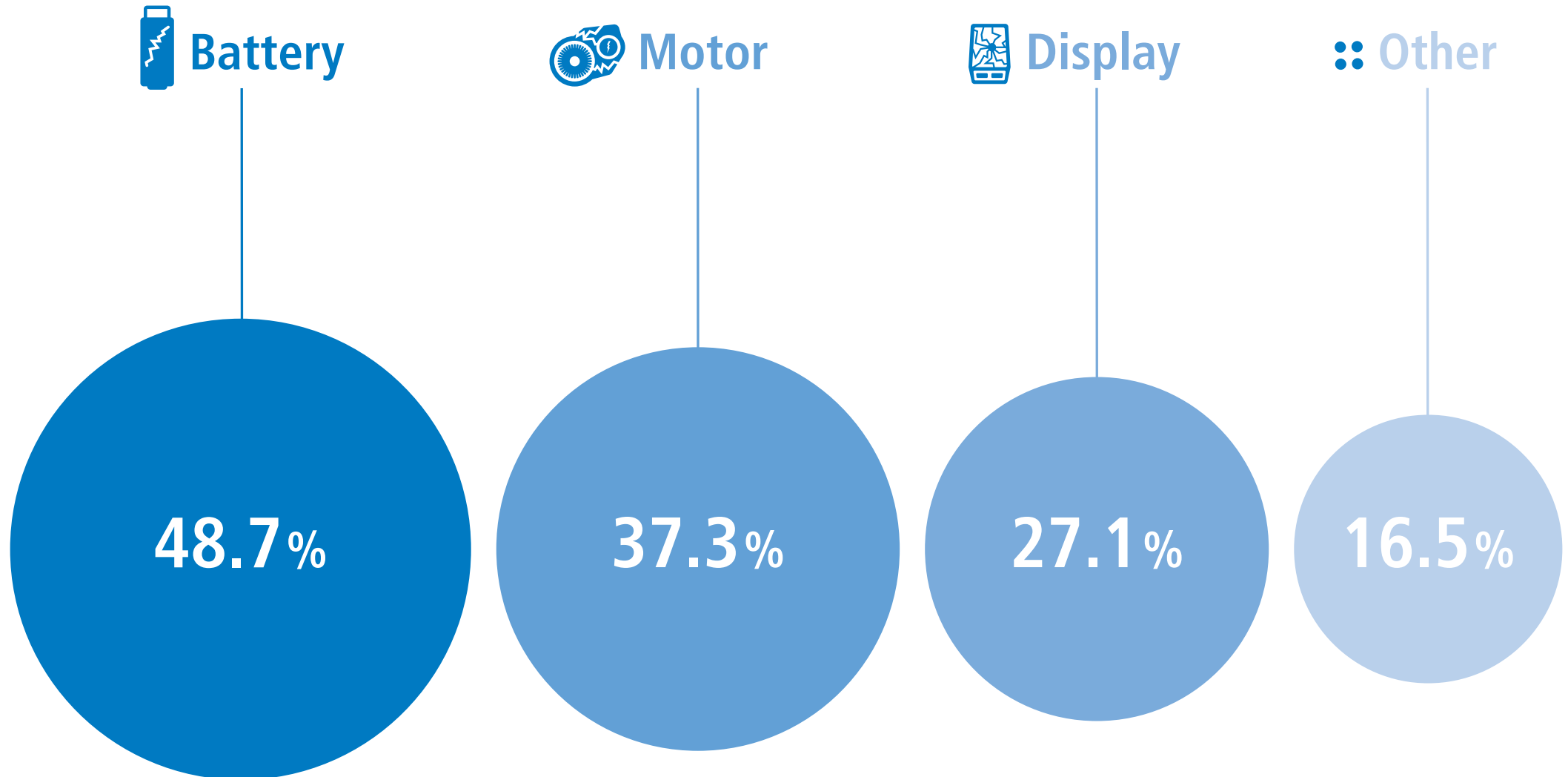
Components affected by technical defects

## Problems with the battery are widespread

Almost 50% of the batteries have technical problems; 37.3% of the motors are affected. Disproportionately high is the percentage of displays with technical defects.

› n = 351

› Multiple answers possible



Accident-related damage to the e-bike

## Battery again hit the hardest

With 44.3%, the battery bears the brunt, followed by the handlebar, motor and display. Also at risk are the wheels and stems.

▶ n = 271

▶ Multiple answers possible



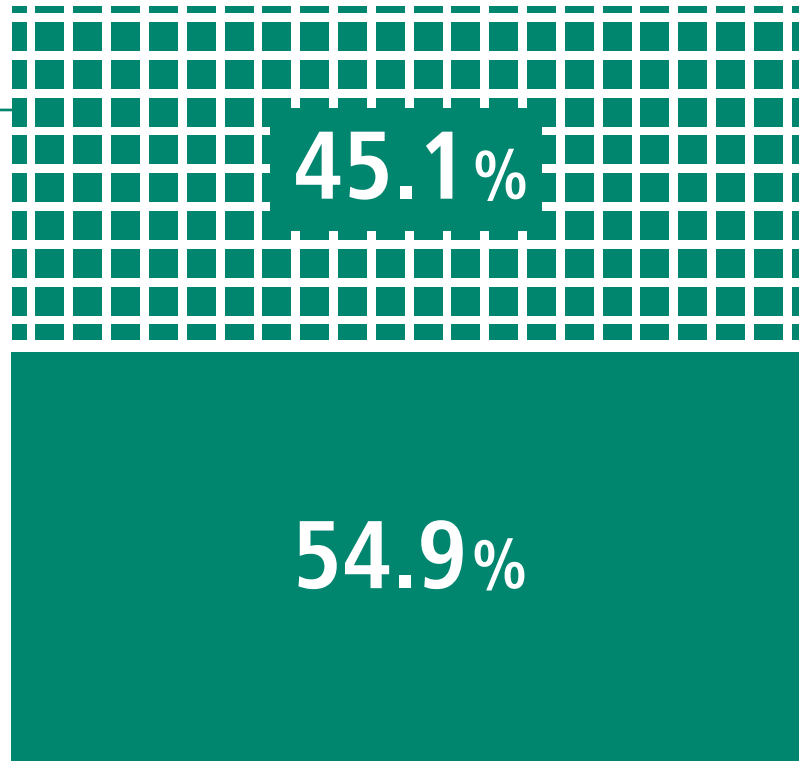
44.3%	Battery	32.5%	Display	18.5%	Fork/suspension fork
35.8%	Handlebar	24.0%	Wheel/spoke	17.7%	Lighting
34.3%	Motor	23.2%	Tyre	8.9%	Other

Theft frequency with e-bikes

## E-bikes and components are almost equally at risk

Most thieves steal the entire e-bike, but in 45.1% of cases individual components such as the battery are targeted.

Individual components of the e-bike were stolen.



45.1%

54.9%

The entire e-bike was stolen.

n = 71





Damage distribution:

# Motors, batteries & displays

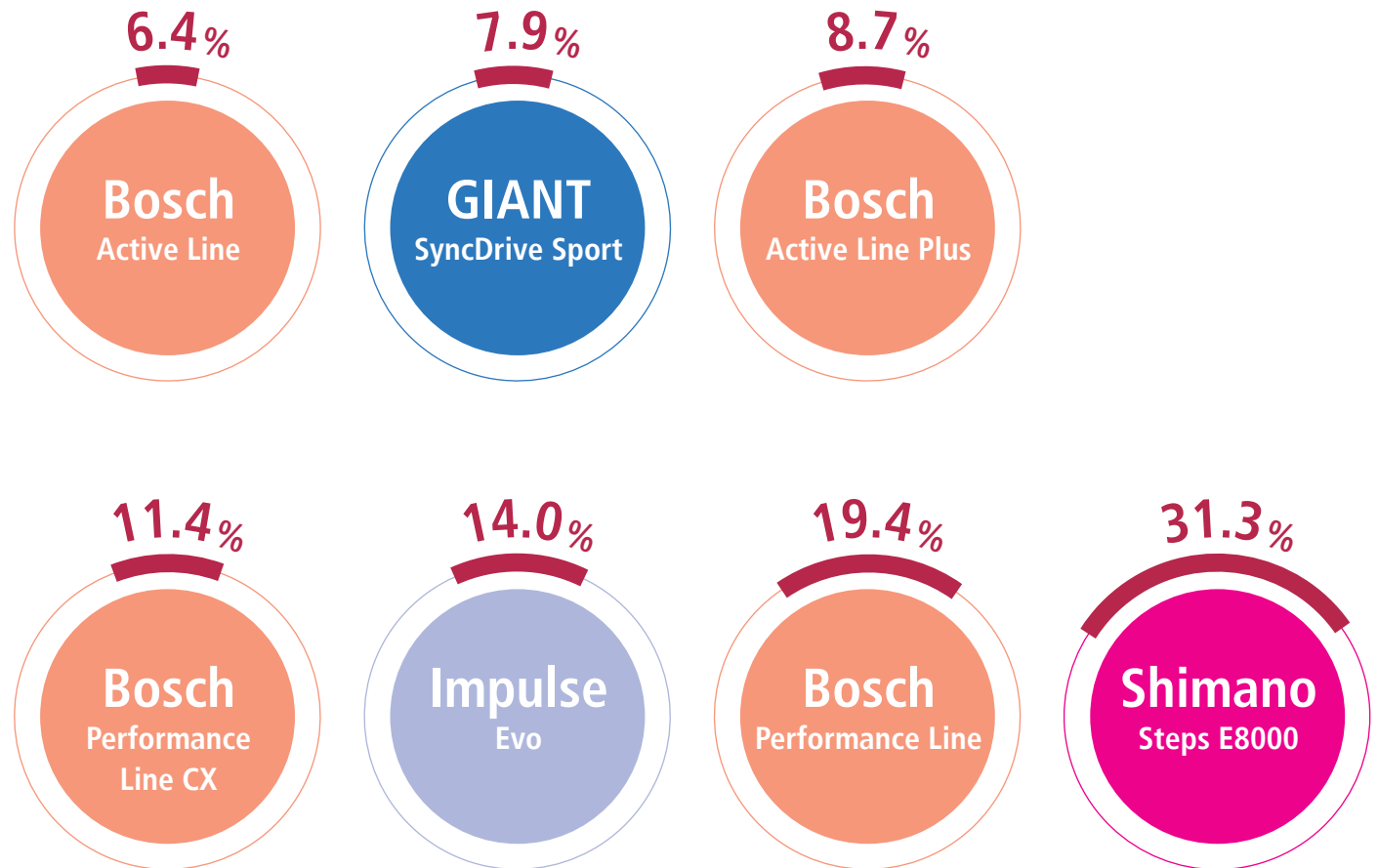
The motor, battery and display are essential components of the e-bike, so the damage distribution with regard to these components is very interesting. Taken into account were damages caused by accidents as well as by technical defects.

A striking feature is that the frequency of damage to the motor, battery and display varies greatly depending on the model. It is less than 10 per cent for the Bosch Active Line, GIANT SyncDrive Sport and Bosch Active Line Plus e-bike motors, while almost a third of the Shimano Step E8000 motors have defects. The investigation into the damage distribution for e-bike batteries also shows clear deviations: Yamaha Lithium Ion and Impulse Li-Ion 36 V achieve top values with 3.0 and 4.2 per cent, while batteries by Bosch and GIANT rank third to fifth (13.4 - 16.7 per cent). Shimano Steps BT-E8020 batteries are by far the most susceptible to damage with well over 50 per cent. The situation is similar in terms of damage distribution for selected e-bike displays: Shimano SC-E7000 shows defects in over a quarter of the displays, while with Bosch Intuvia and Bosch Purion the value is significantly lower at 8 per cent and 11.7 per cent, respectively.

Damage distribution for e-bike motors

## Bosch Active Line is the most robust

With only 6.4% of motor engine damage, Bosch secured the first place; with Shimano Steps E8000, however, almost a third of the motors were deficient.



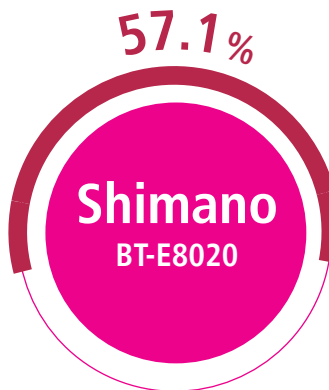
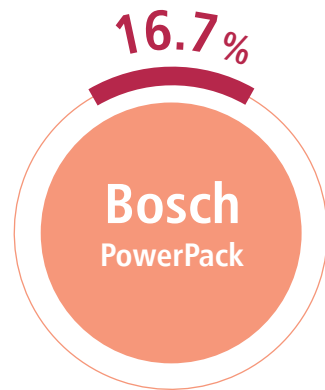
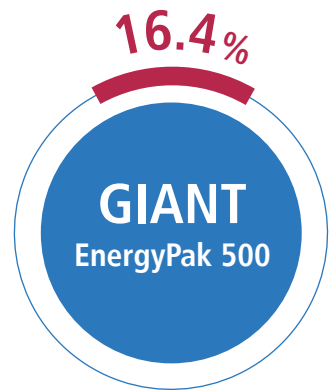
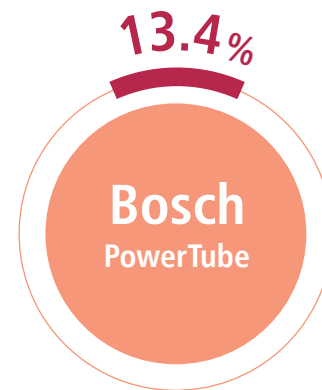
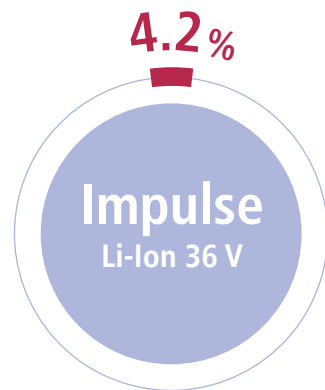
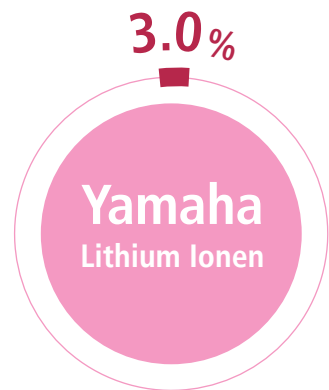
▶ Min. no. of respondents: 20

▶ Min. no. of damages: 1

Damage distribution for e-bike batteries

## Unbeatable: Yamaha Lithium Ion

Only 3% of these batteries have problems, compared to 13.4% for Bosch PowerTube. Shimano BT-E8020 trails far behind with 57.1%.



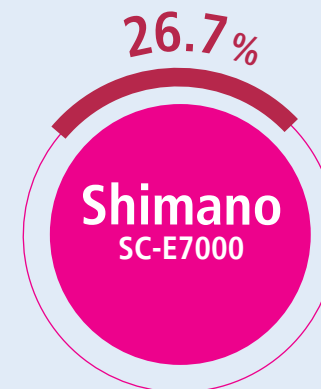
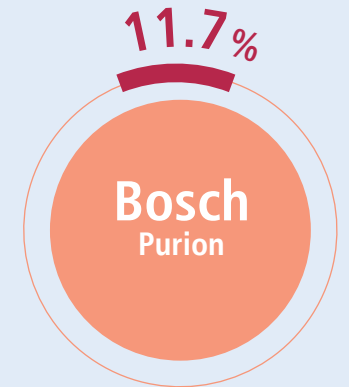
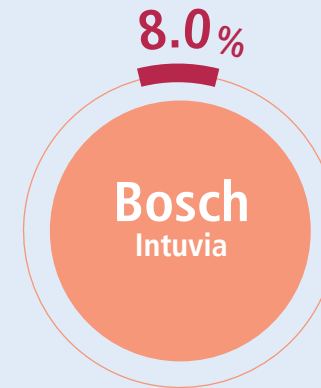
▶ Min. no. of respondents: 20

▶ Min. no. of damages: 1

Damage distribution for e-bike displays

## Shimano brings up the rear again

Bosch Intuvia and Purion displays rarely show any damage. Shimano SC-E7000 are more fragile with 26.7%.



▶ Min. no. of respondents: 20

▶ Min. no. of damages: 1

Damage & protection:

# Security measures

E-bike users want to protect their vehicle as best as possible. They often use stable chain locks or U-locks for this. One in five even uses multiple locks simultaneously. Precautions are also taken against technical defects and accidents: 31.7 per cent of those surveyed have appropriate insurance against damage.

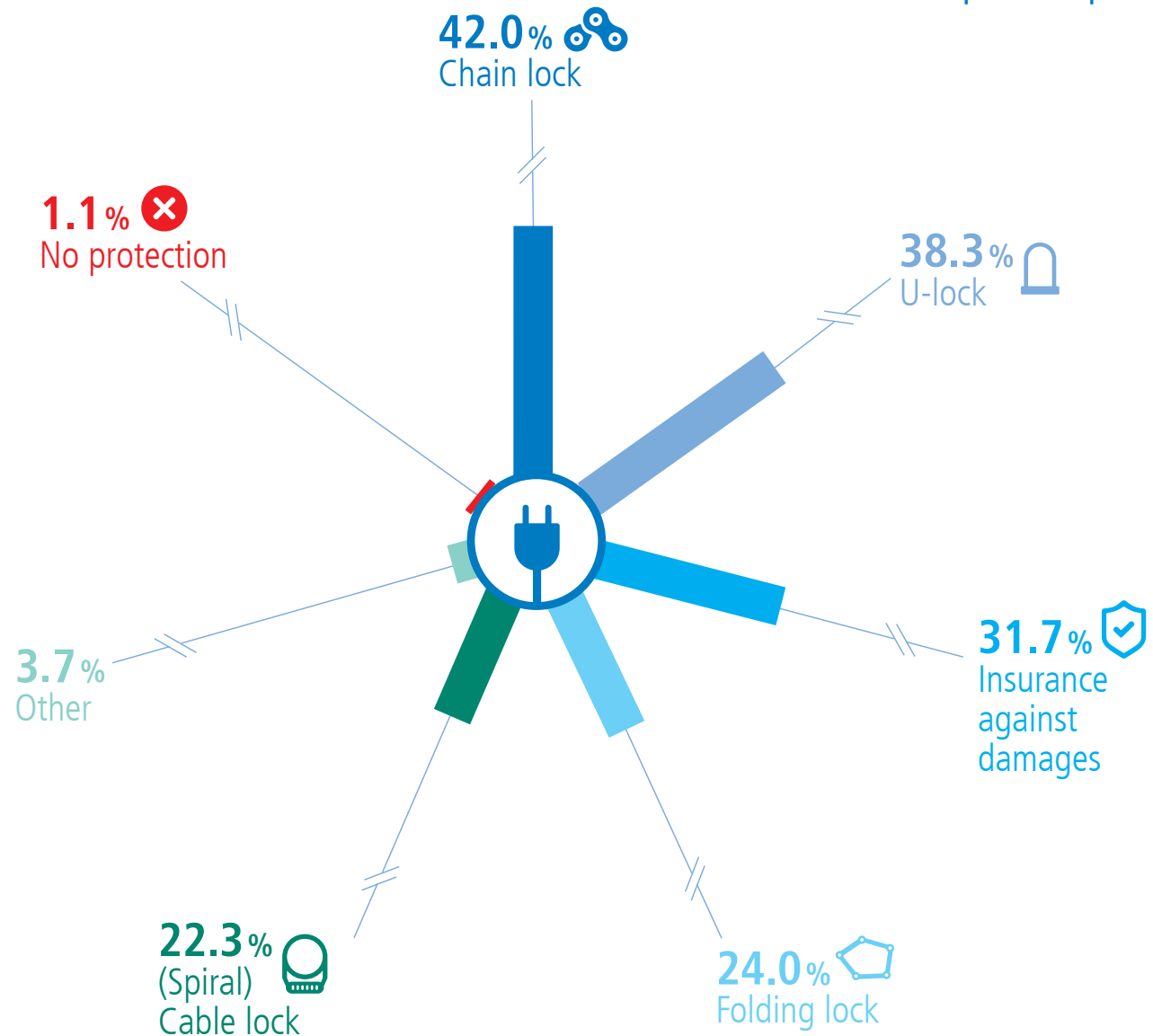
The choice where to leave the e-bike at night also indicates that the fear of theft is very widespread: only 8.6 per cent of e-bikes stay outdoors at night, all others are safely locked-up in the house, garage, etc. Battery protection polarizes: if the e-bike is outdoors, the battery will keep it company with a 45.8 per cent chance. The other owners remove the expensive battery and take it with them.

## Securing the e-bike Lock and insure

Stable locks are very popular, with 31.7% taking out insurance.  
Only 1.1% do without any protection.

› n = 1,714

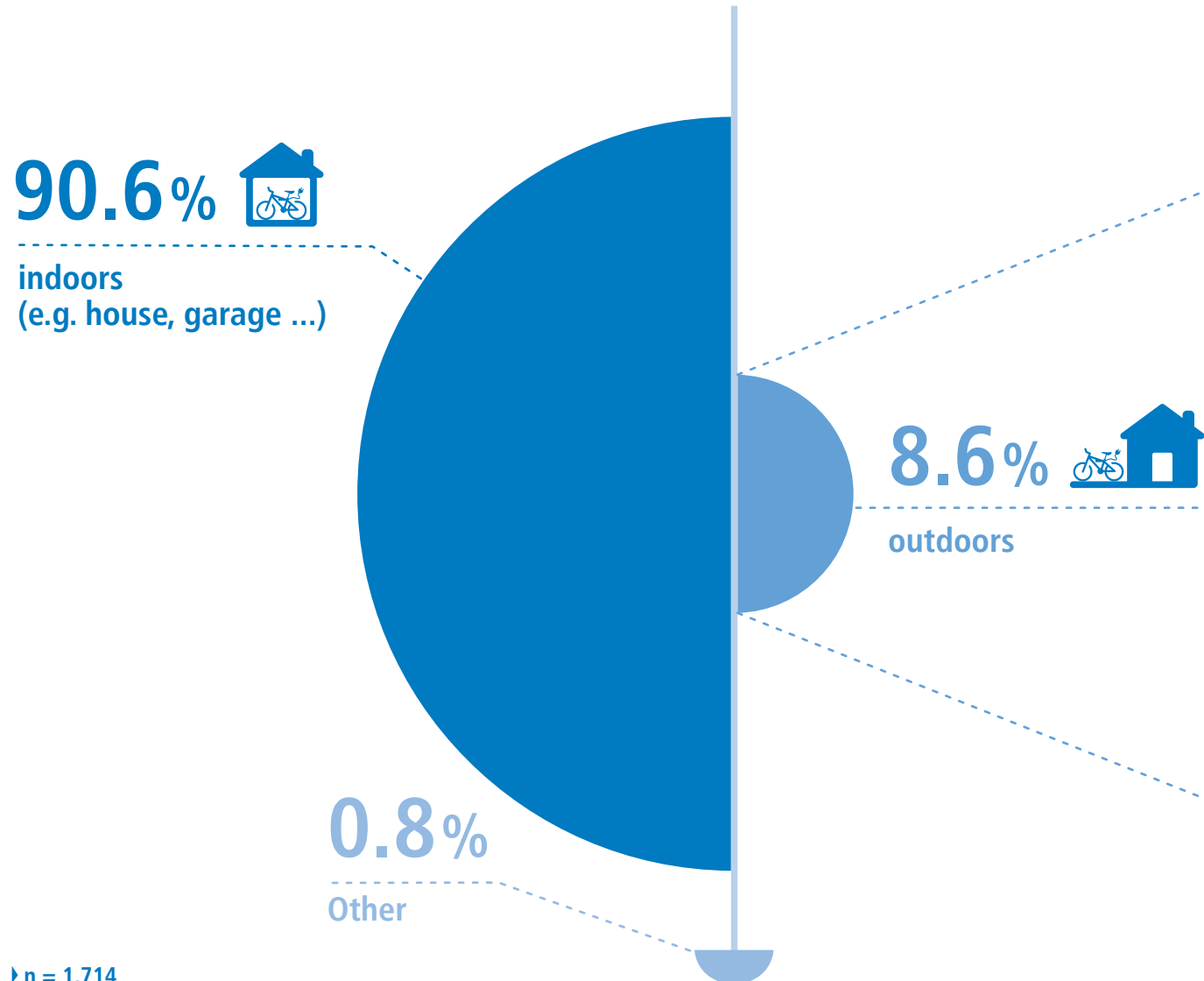
› Multiple answers possible



Overnight parking

Few e-bikes stay outside

Fear of theft is widespread: over 90% of all e-bikes stay locked-up indoors.

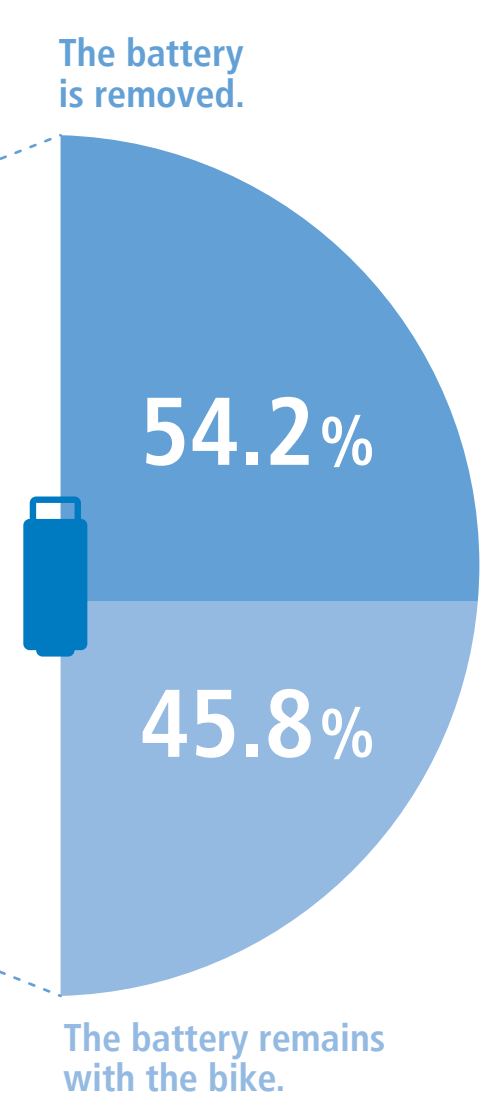


n = 1,714

Securing the e-bike battery

Here, opinion is divided

In 45.8% of e-bikes left outside, the battery remains with the bike even though the removable battery is a popular item among thieves.



n = 1,468

Repair behaviour:

# Self-repair vs. bicycle workshop

This chapter provides surprising results: the will to self-repair an e-bike is extremely high. More than 40 per cent of those surveyed stated that they only resorted to assistance when necessary and repaired e-bike components themselves if possible. Only 34.7 per cent bring the damaged bike to the workshop.

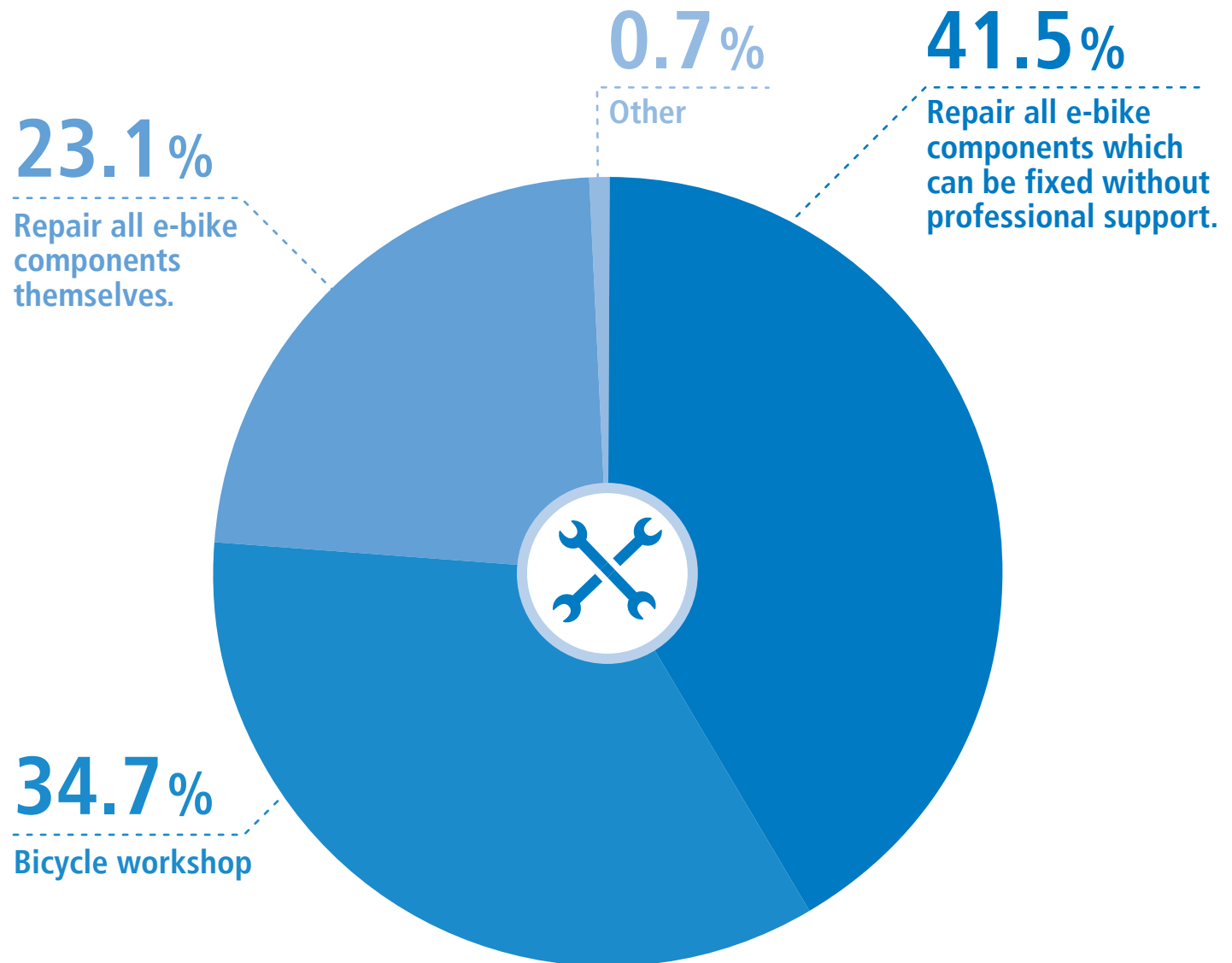
Even more astonishing is the fact that 23.1 per cent of users completely repair their e-bikes themselves. Although men have more confidence in self-repair, the group of women who are keen to repair is also remarkable at 44.4 per cent. The age group of 30-39 year olds reinforces this trait with both men (47.1 per cent) and women (46.4 per cent).

How are damages repaired?

**The trend: do-it-yourself**

Only around a third have repairs carried out, and 41.5% partially fix their bikes. Surprisingly, 23.1% repair their bike completely.

n = 545

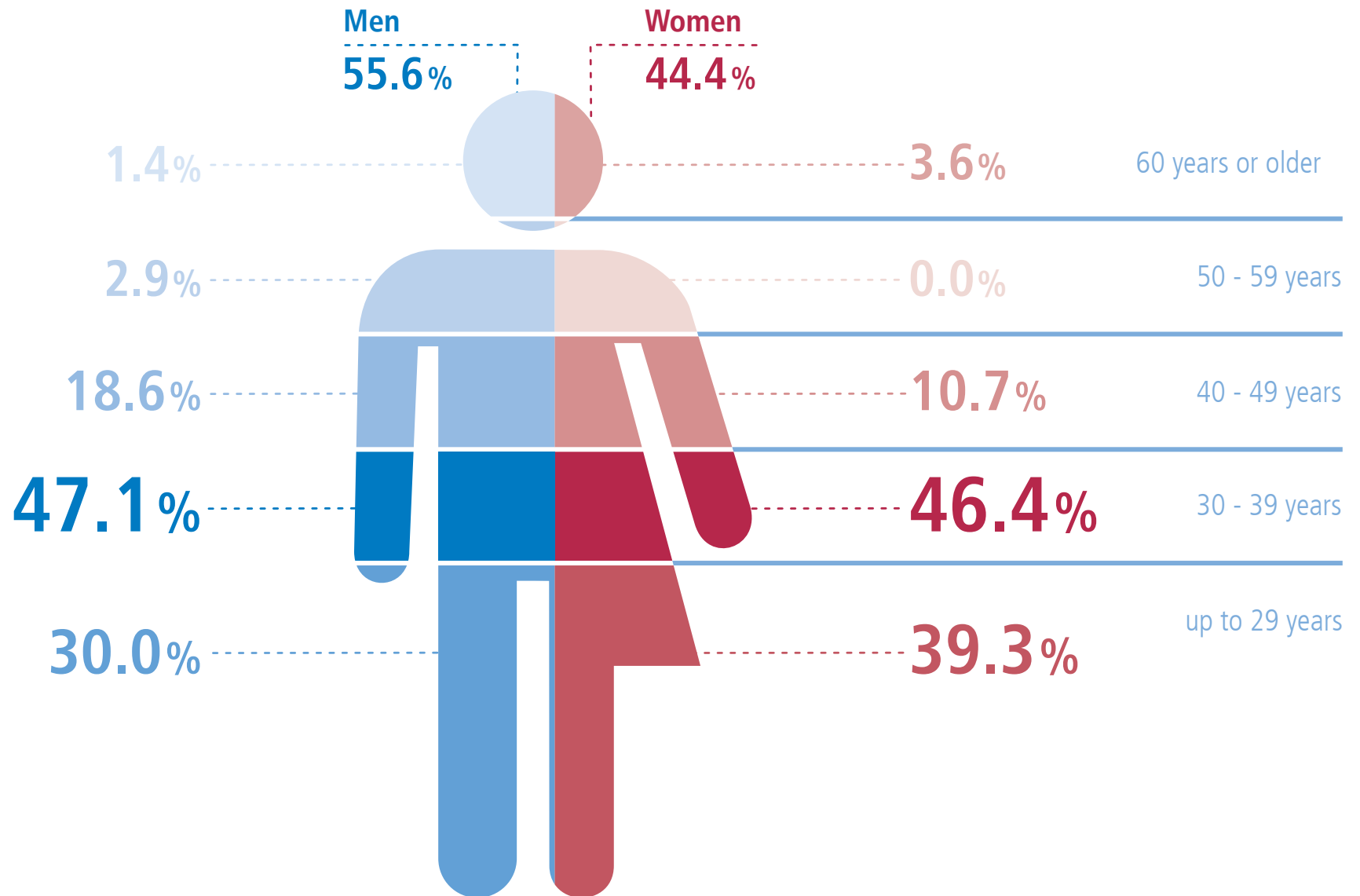


Complete self-repair

Men are more likely to lend a hand

Overall, more men make repairs (55.6%), especially 30-39 year olds. In the age group 29 or younger, women are in front with 39.3%.

n = 126



# Repurchase probability & battery satisfaction

The users's satisfaction with their e-bike brand is expressed in their likelihood of repurchase: Hercules takes first place with 82 per cent, CityBlitz convinced 77 per cent of its users. Kettler and BMC have customer loyalty of 76 per cent each, followed by Fischer in fifth place with 72 per cent.

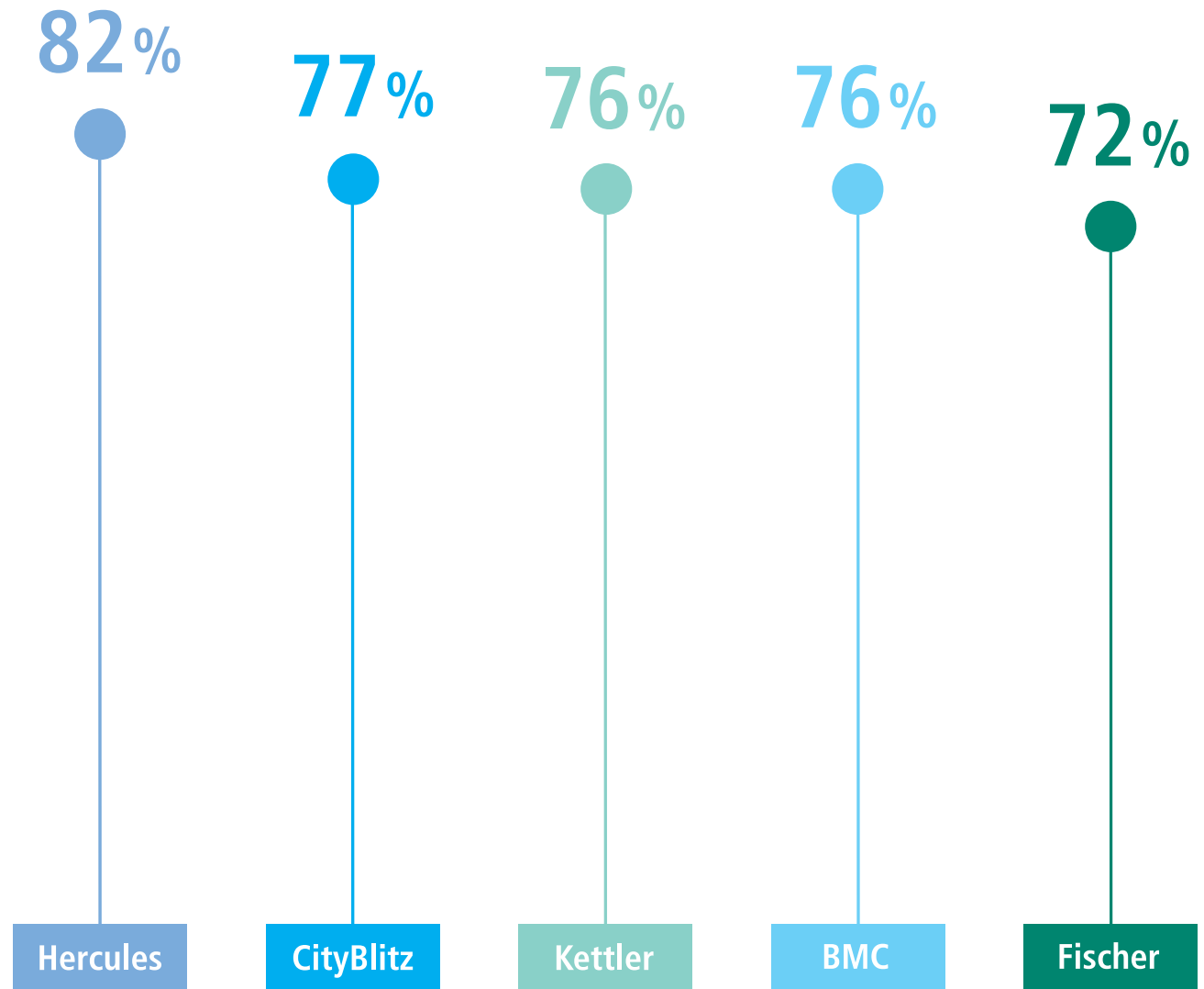
The battery range is of particular importance: Hercules is again at the head of the top 5 in battery satisfaction – the Rob Fold R8 500Wh convinced 87 per cent of users. BMC Alpenchallenge AMP Sport One 2019 ranks second with 84 per cent, CityBlitz CB024 wins bronze. 80 per cent each are satisfied with the battery range of the Kettler Traveler E Gold Altus and the Cube Access Hybrid ONE 400 model 2019.

The Flop 5 is rather composed of low-budget models or products from niche manufacturers: Victoria St. Moritz is in first place with 67 per cent, followed by Fischer CITA 4.0i 26' and Prophete Navigator 7.8 with 65 per cent each and AsVIVA B13 (64 per cent). The Zündapp Silver 5.5 is far behind, half of all users are dissatisfied with its battery range.

Repurchase probability by manufacturer

Particularly satisfied: Hercules riders

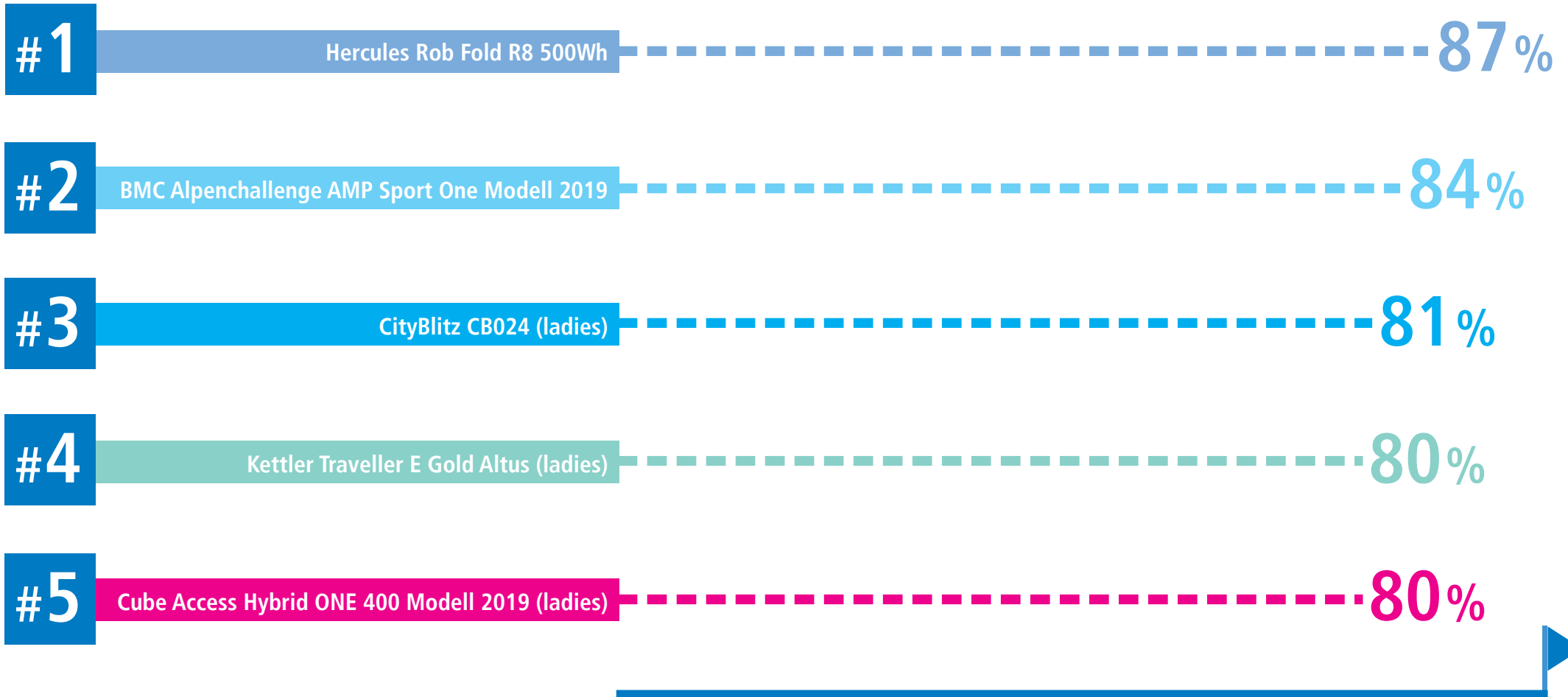
82% of Hercules e-bikers would probably buy again, 72% are convinced of Fischer.



Top 5: Satisfaction with the battery range

## Hercules again in 1<sup>st</sup> place

With Rob Fold R8 500 Wh, Hercules has 87% customer loyalty, in second place BMC Alpenchallenge AMP Sport One 2019 with 84%.

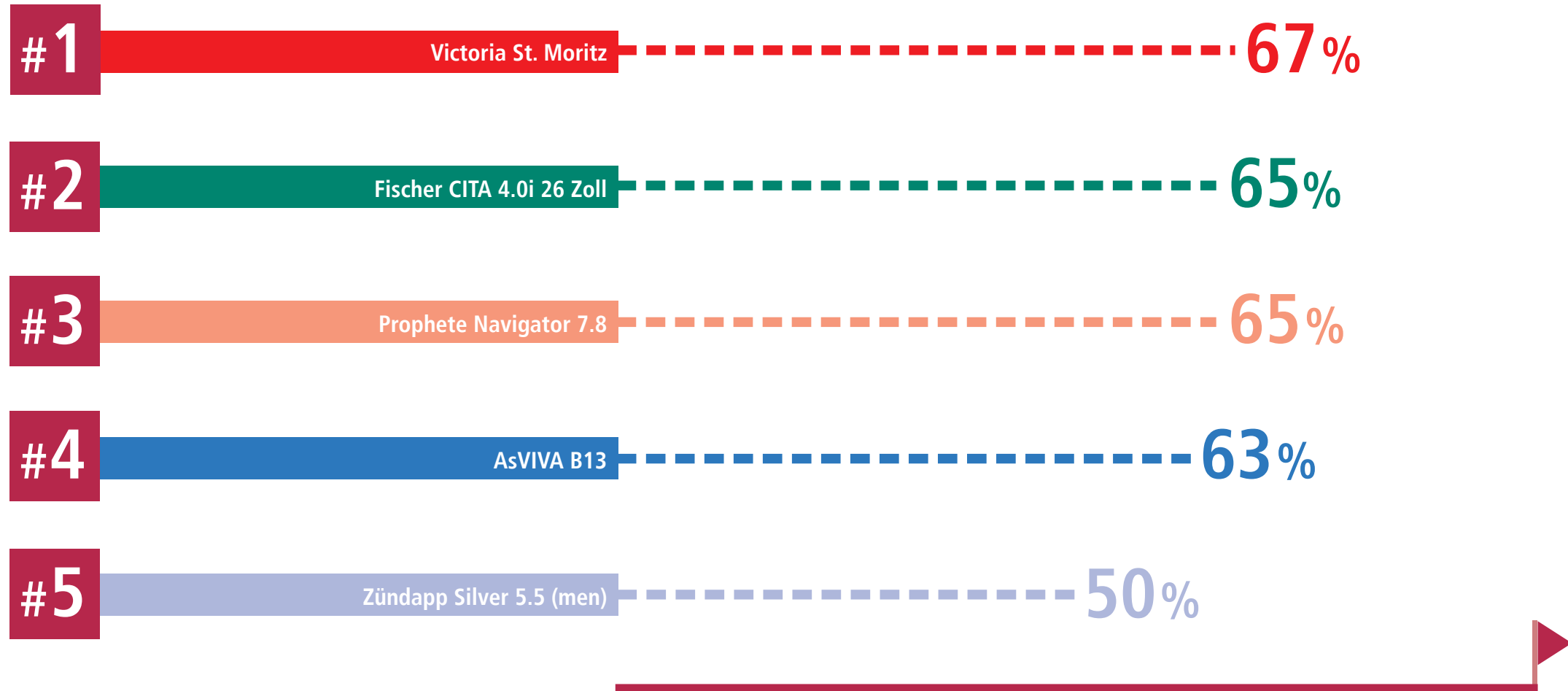




Flop 5: Satisfaction with the battery range

## These batteries are less convincing

The battery range of Victoria St. Moritz is okay for 67%,  
Zündapp Silver 5.5 (men) only satisfies half of the users.



## In the spotlight: The e-bike users

While the gender distribution of e-bike riders is relatively balanced, there is a surprising result in terms of age: only 14.2 per cent are 60 years or older, while 24.7 per cent fall in the 30-39 age group, making this demographic the most represented.

The e-bike is mostly used for leisure & sport. Only 49.5 per cent use it to commute. More than half ride several times a week, 25.2 per cent even use the bike every day. It is all the more astonishing that 29.7 per cent only travel 500 kilometres a year.

The gender-specific frequency of accidental damage corresponds to the general gender distribution, with men at 53.1 per cent. Surprisingly, the risk of accidents decreases with increasing age – it is 38.4 per cent for 30-39 year olds and only 3.7 per cent for those over 60. Alarmingly, 36.5 per cent of all accident-related damage occurs in the group of 29 year olds and younger, despite this group only owning 15.9 per cent of all e-bikes.

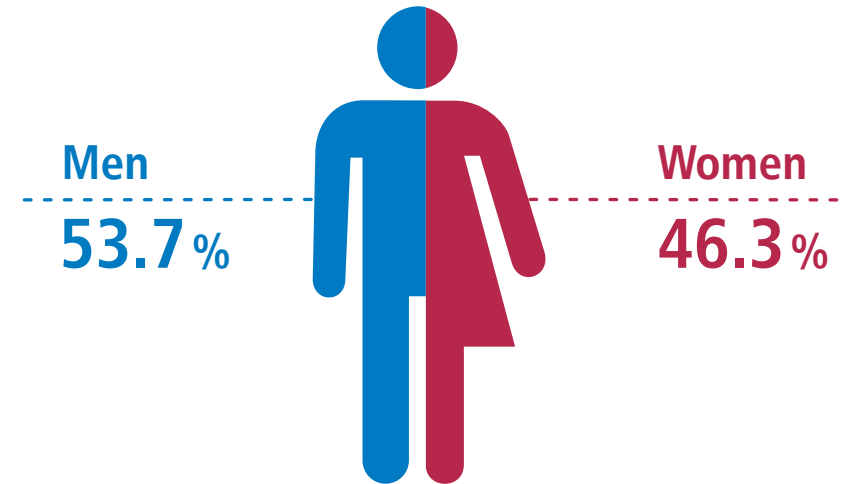
In the damage frequency by federal state, all causes of damage were taken into account. The national average is 31.8 per cent, with a particularly large number of damages in the city-states, possibly due to higher traffic density. Outstandingly, Mecklenburg-Western Pomerania is almost damage-free with only 8 per cent.

▶ n = 1.714

E-bike users / gender

### Most e-bikers are male

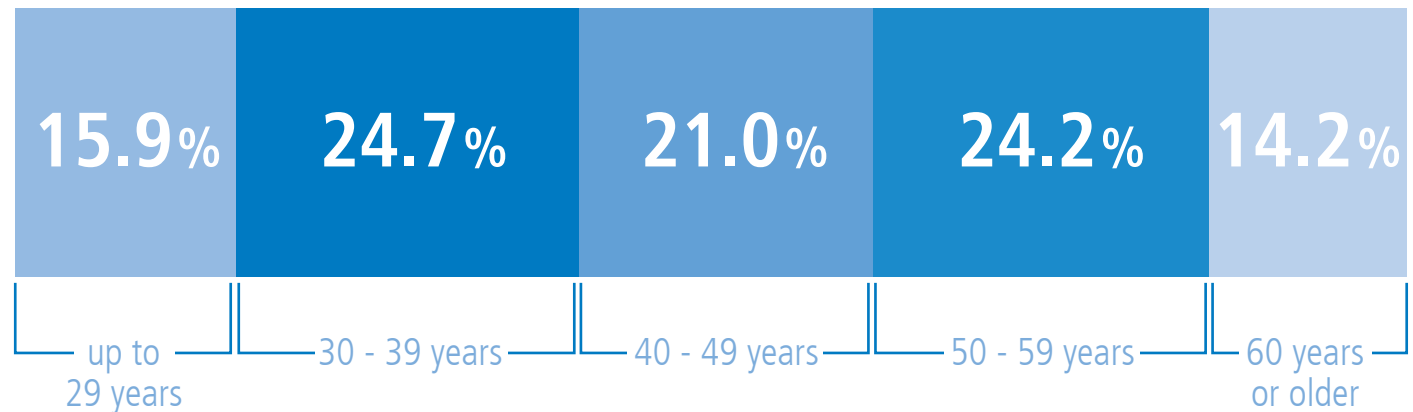
The majority of e-bike users are men, with women accounting for 46.3% of the total.



E-bike users / age

### Over 60 per cent younger than 50 years

Most frequently represented are 30-39 year olds with 24.7%, only 14.2% of the users are 60 years or older.



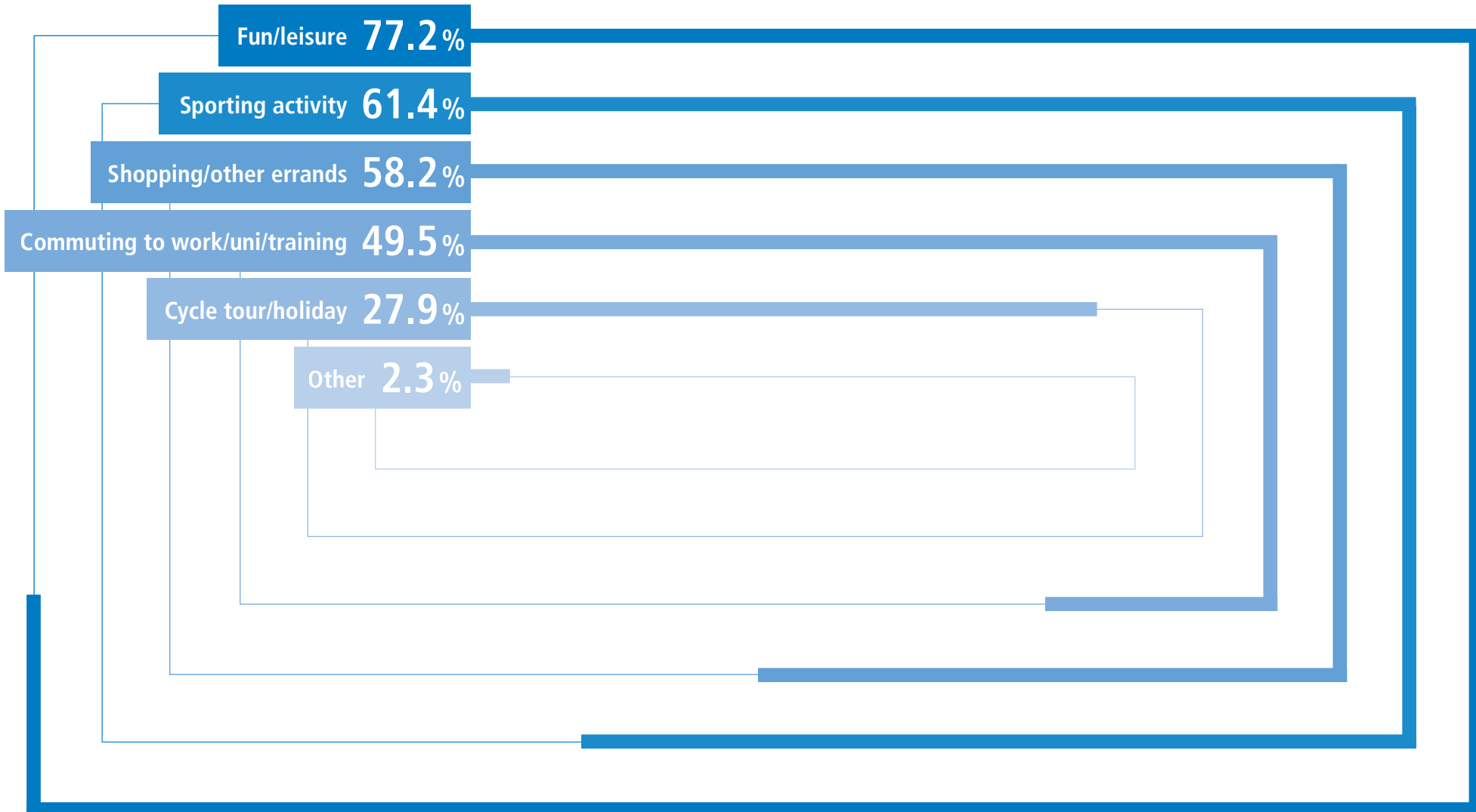
What is the e-bike used for?

## The focus is on leisure

More than three quarters of the owners use their e-bike mainly as a leisure activity, only 49.5% use it to go to work or a training facility.

› n = 1,714

› Multiple answers possible



How often is the e-bike used?

## Many cycle several times a week

Over half of the users travel several times a week, 25.2% do so daily. One-tenth use the e-bike once a week.

n = 1,714

**52.6%**  
Several times  
per week

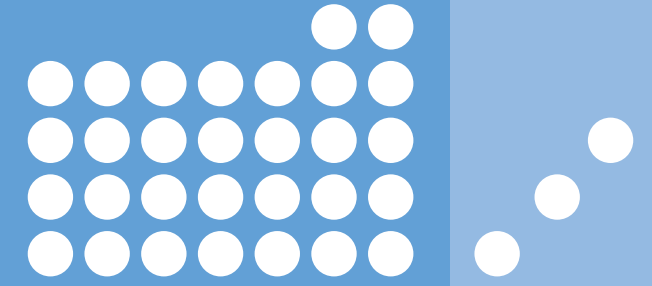
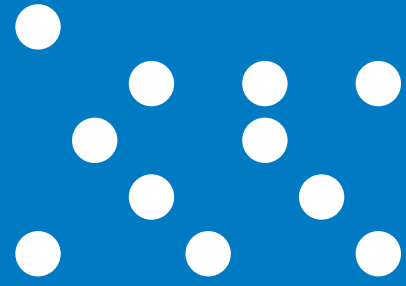
**10.2%**  
Once per week

**3.6%**  
Less often

**25.2%**  
Daily

**0.1%**  
Never

**8.3%**  
Several times  
per month

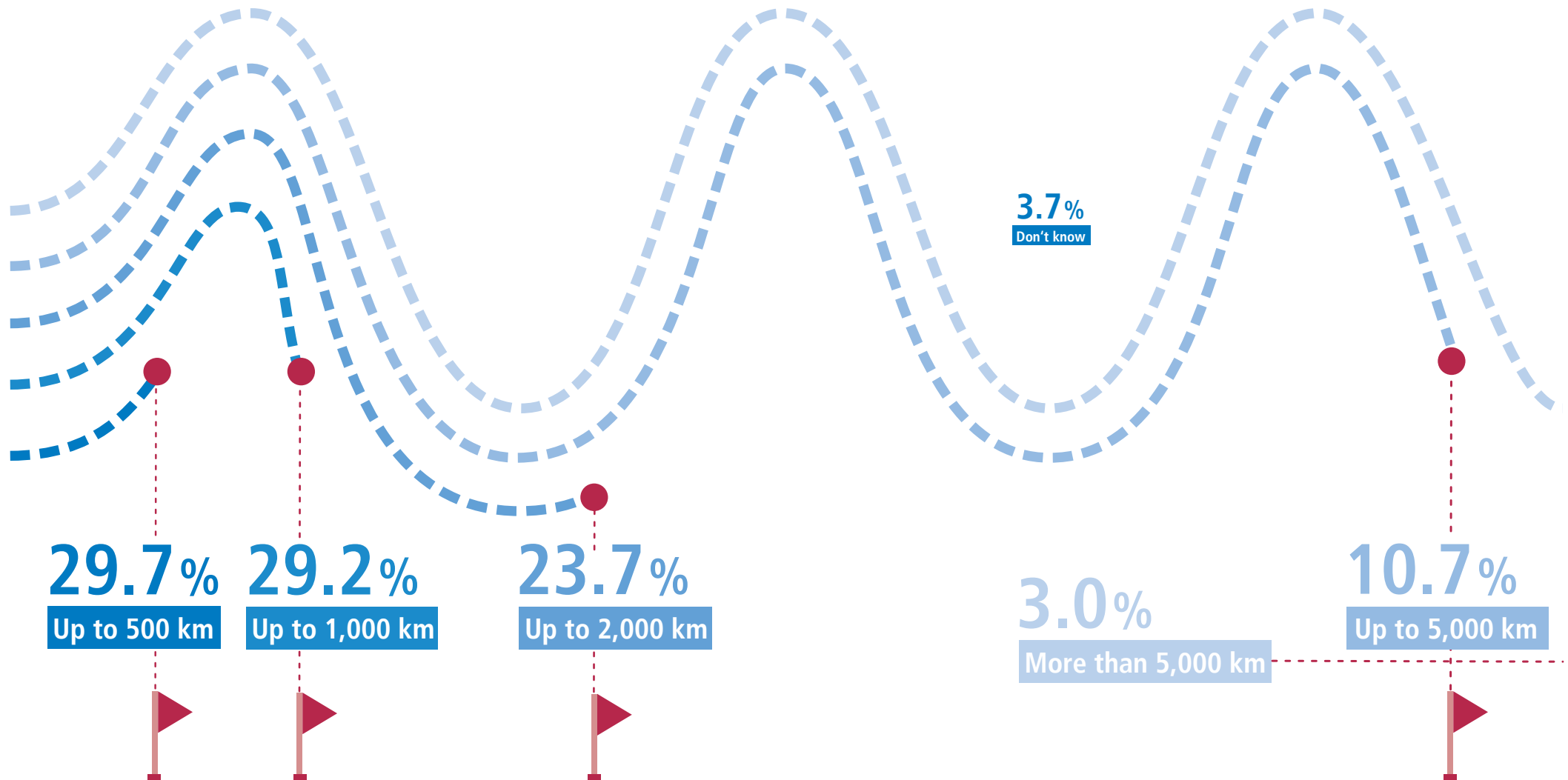


Routes travelled annually:

## Often only up to 500 kilometres

29.7% of users cycle up to 500 kilometres per year, 29.2% up to 1,000. Almost a quarter of them cover 2,000 kilometres a year.

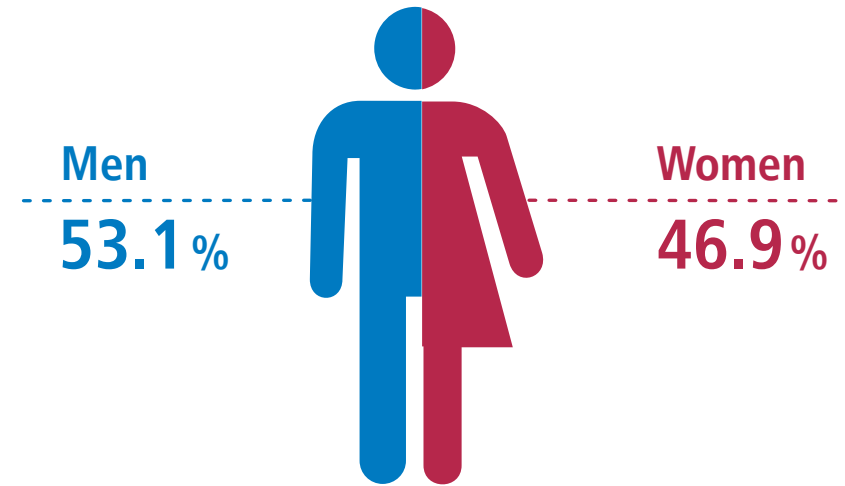
n = 1,714



Frequency of accident-related damage / gender

### Men are a little more prone to accidents

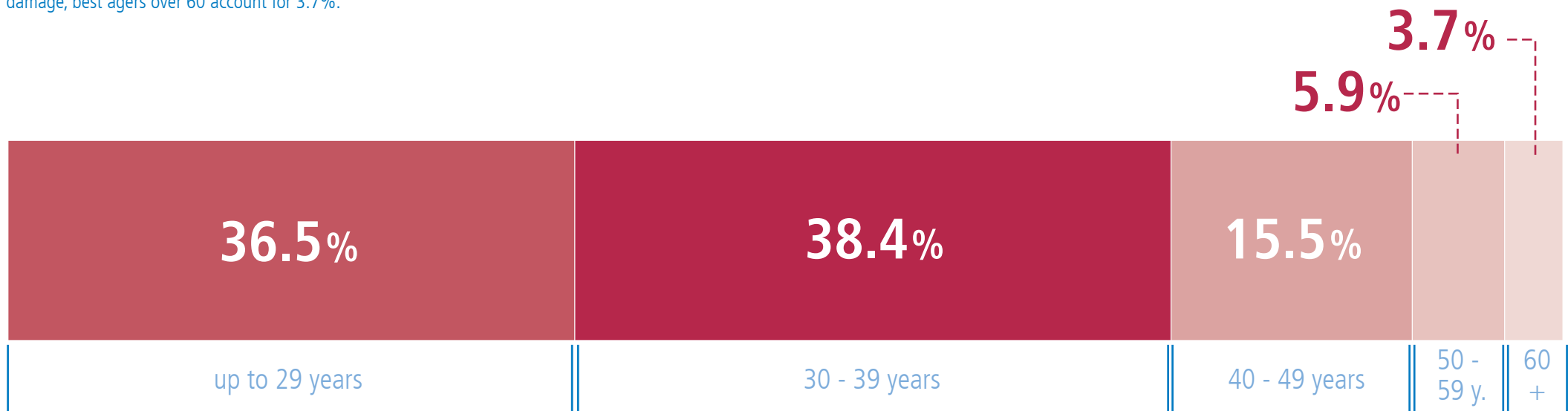
53.1% of the accident-related damage is caused by male cyclists, women account for 46.9%.



Frequency of accident-related damage / age

### Best agers drive particularly carefully

The 30-39 age group causes 38.4% of the accident-related damage, best agers over 60 account for 3.7%.

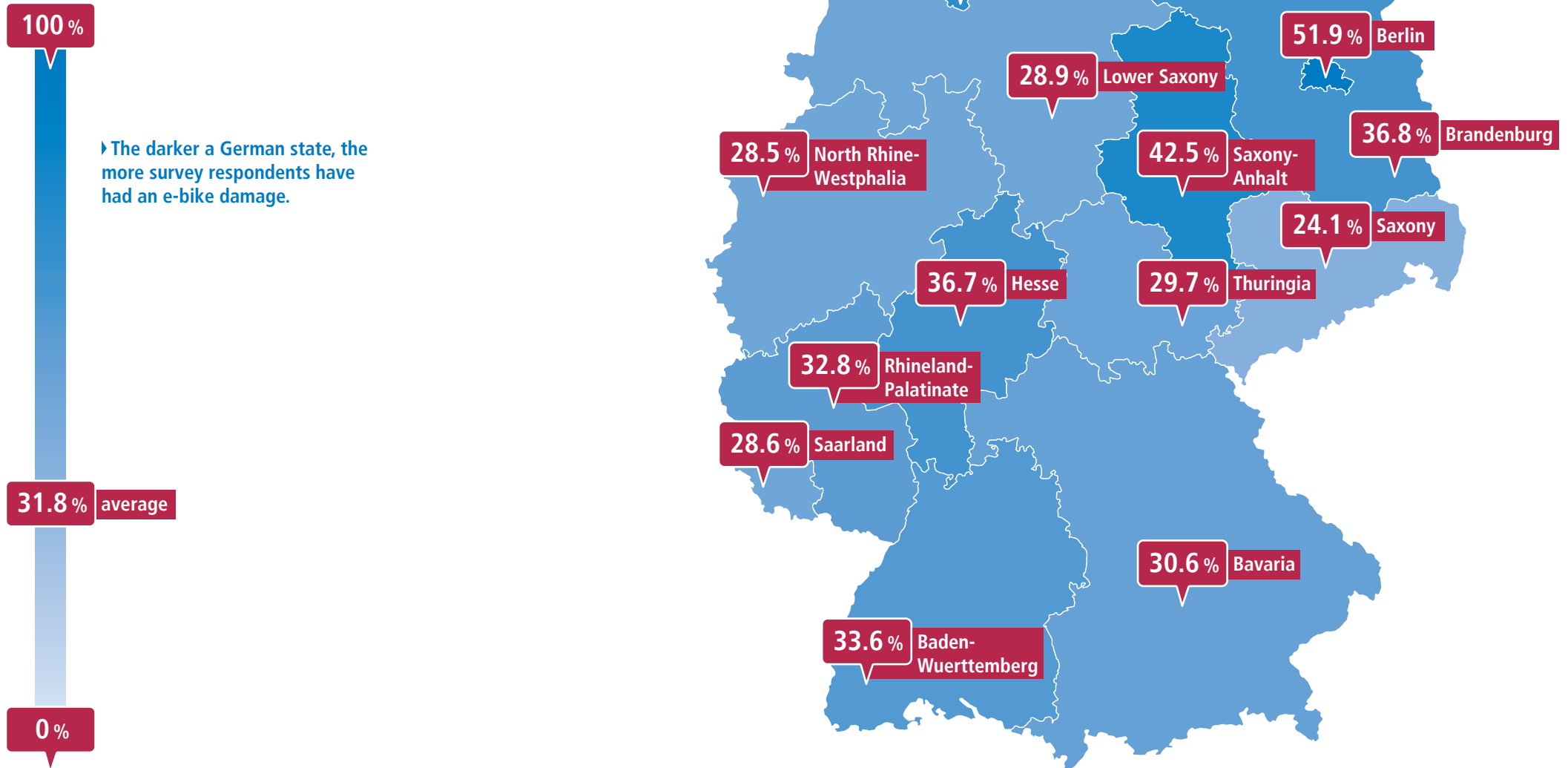


▶ n = 271

Damage frequency by federal state

## City-states disproportionately represented

Berliners had 51.9% cases of damage, followed by Saxony-Anhalt, Hamburg and Bremen. Gratifyingly, Mecklenburg-Western Pomerania had 8%.



Good to know:

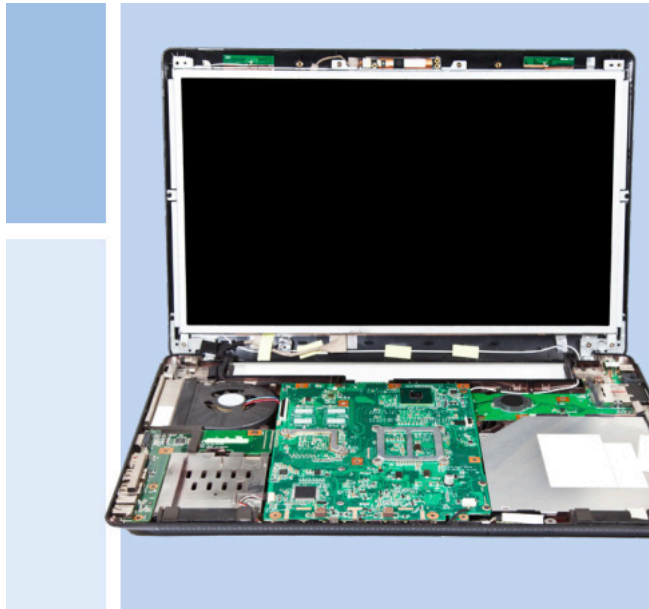
# Further WERTGARANTIE studies

Laptops in the spotlight

## Laptop Repair Study 2018

With the Laptop Repair Index and the corresponding Repair Study, WERTGARANTIE provides a comprehensive overview of the robustness and durability of individual laptop models. A representative survey of 11,140 users was conducted for the study.

» [Click here for the study.](#)



Tablets in the spotlight

## Tablet Repair Study 2018

Using the Repair Index, WERTGARANTIE reveals how durable and robust individual tablets are. The study shows, among other things, which tablets break particularly often and which models are expensive to repair.

» [Click here for the study.](#)

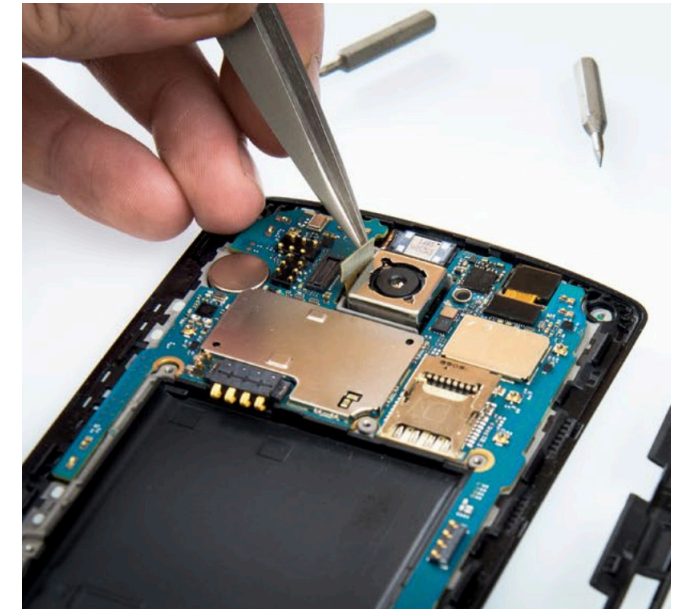


Smartphones in the spotlight

## Smartphone Repair Study 2019

clickrepair provides an overview of the robustness of current and older smartphone models. The study shows which manufacturers build the most robust devices, which have particular weaknesses in smartphones and more.

» [Click here for the study.](#)





# A good drive every day with the BikeManager App

No matter whether they have a city bike or trekking bike, e-bike or pedelec - the BikeManager is just the right app for everyone who likes cycling.

With this app, all important bike information is always digitally at hand. In case of damage, the pick-up service can simply be called via the app, whereas the workshop finder navigates the user to the nearest repair partner.

## The BikeManager App Our service for all bikes



## Theft report made easy

If the bike or e-bike/pedelec is stolen, the app user can quickly and easily export the bike passport as a PDF for theft report to the police and insurance company.

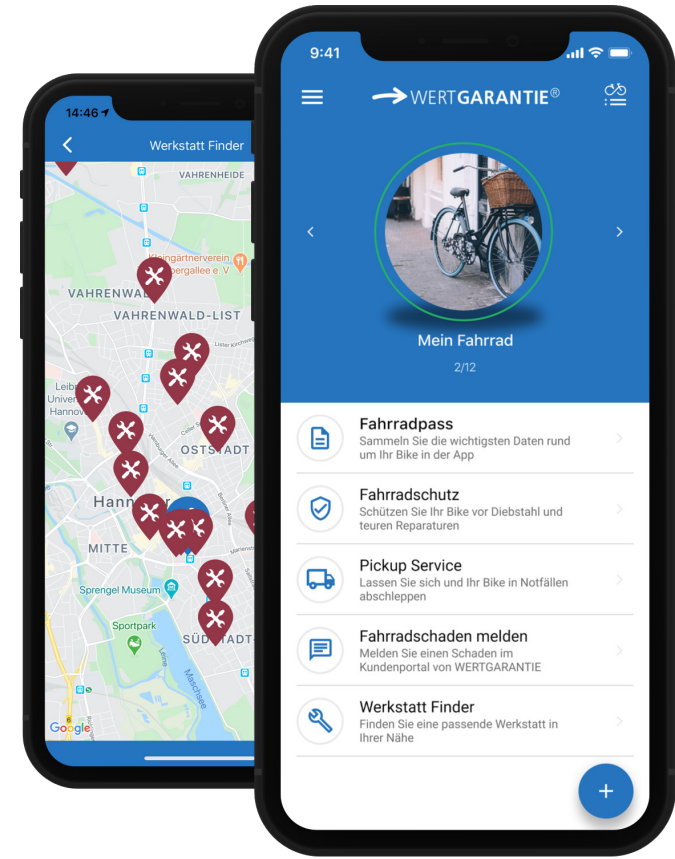
## Repair workshop needed?

With the workshop finder, all app users have access to over 1,700 partners across Germany and Austria who will help in case of damage. And as soon as the user has decided on a workshop, the integrated navigation function will show the direct route to its location.

## Bicycle breakdown? No problem!

Customers with an insured e-bike/pedelec can call the pick-up service directly via the app. The breakdown service will take them back to a workshop or the starting point of their tour. The following also applies: the owner of the first uninsured bike or e-bike/pedelec, which is being registered manually via the app, is entitled to a 6 months free pick-up service!

Discover our BikeManager yourself:  
[www.bike-manager.de](http://www.bike-manager.de)



Currently only available in the German App-Store.  
▶ As per: May 2020

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This study provides just a selection of the results that were collected and analysed. Please get in touch with us if you would like to have more detailed information!

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