

E-Bike Repair Study 2021



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* The basis of this study is a representative survey of 2.098 participants aged 18 years and over conducted in cooperation with Statista. The survey period was between 14.12.2020 and 21.01.2021. The results of the survey and the e-bikes/pedelecs insured by WERTGARANTIE provided the data on which the Repair Index is based.

Dear readers,

Never before have so many e-bikes been sold as in 2020 - around 1.95 million according to Statista. As our e-bike study shows, damages have also increased slightly. However, technical defects and accidents are still the main sources of damage which e-bike owners are increasingly protecting themselves against with insurance. Theft accounts for only 5.8 per cent of the damage, possibly because users effectively secure their expensive bikes against unauthorised access. For example, it can be observed that instead of easily removable spiral locks, more and more stable chain and folding locks are being used.

The e-bike repair index and the associated repair study* by WERTGARANTIE provide many revealing insights regarding the susceptibility to damage and the repair costs of selected e-bikes and brands. In addition, this study also sheds light on repair behaviour, whereby it becomes clear that the trend towards self-repair is continuing: Almost half of all e-bike users repair individual components themselves. The willingness to carry out complete repairs, on the other hand, has decreased significantly; instead, the professional services of bicycle repair shops are being used more frequently. This is a positive development, as it reduces the risk of improper repairs and the resulting safety impairments.

By far the most striking changes compared to the previous year can definitely be found in the area of usage behaviour. There is a strong increase in young e-bike riders. In addition, the e-bike is used significantly more for leisure and sport than before. Daily use has decreased, but weekly use has increased. Last but not least, annual distances of up to 500 kilometres are giving way to annual distances of up to 1,000, 2,000 and 5,000 kilometres. In summary, the changed usage behaviour for e-bikes can be clearly attributed to the effects of the corona pandemic.

We wish you new insights while reading this study!

Marco Brandt
Division Manager Digital Business

DAMAGE FACTS:

The most frequent causes of damage

Almost a quarter of all e-bike damage is due to technical problems, mainly caused by the battery and motor. There are many possible reasons for this, whether faulty manufacturing, improper self-repair and handling or lack of maintenance. While motor and display-related technical problems increased slightly compared to the previous year, the battery, on the other hand, proved to be much more robust. A possible reason for this is that e-bikes and their batteries are more often kept indoors at night, protected from the weather. In addition, batteries are increasingly integrated into the frame and are therefore generally better protected against defects.

This protection also plays a role in the outcome of accidents, which cause 16.4 per cent of all damage: Accident-related defects to the battery decreased by 7.7 per cent, the handlebar is thus the most affected component with 39.5 per cent. The motor is also less susceptible to accident damage than before, at 7.9 per cent, possibly because the manufacturing trend is towards the mid-mounted engine, which is less vulnerable to rear-end collisions.

The fear of bicycle theft is widespread, but despite a slight increase, it only accounts for 5.8 per cent of the total damage. This illustrates the relevance of protecting e-bikes from technical and accidental damage, although of course anti-theft solutions remain important. Overall, e-bikes seem to be even better protected than before, as 3.1 per cent fewer complete bikes were stolen. However, component theft increased to 48.2 per cent, which illustrates the need for the expensive battery to be effectively protected against third-party access.

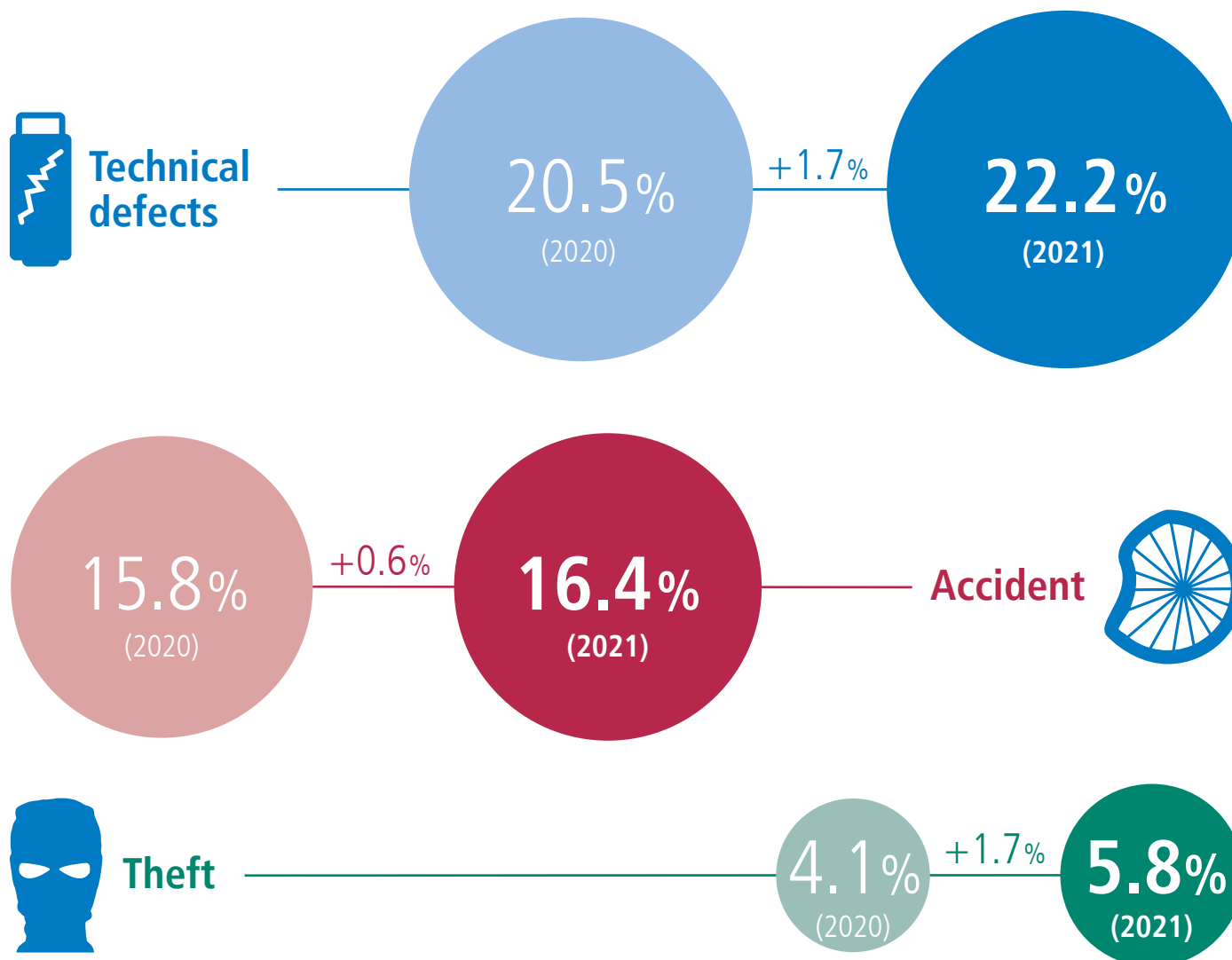
Causes of e-bike damage

Technical problems predominate

Technical problems and accidents continue to be the largest sources of damage; theft damage is significantly less frequent at 5.8%.

› n = 2,098 (2021)

› Multiple answers possible



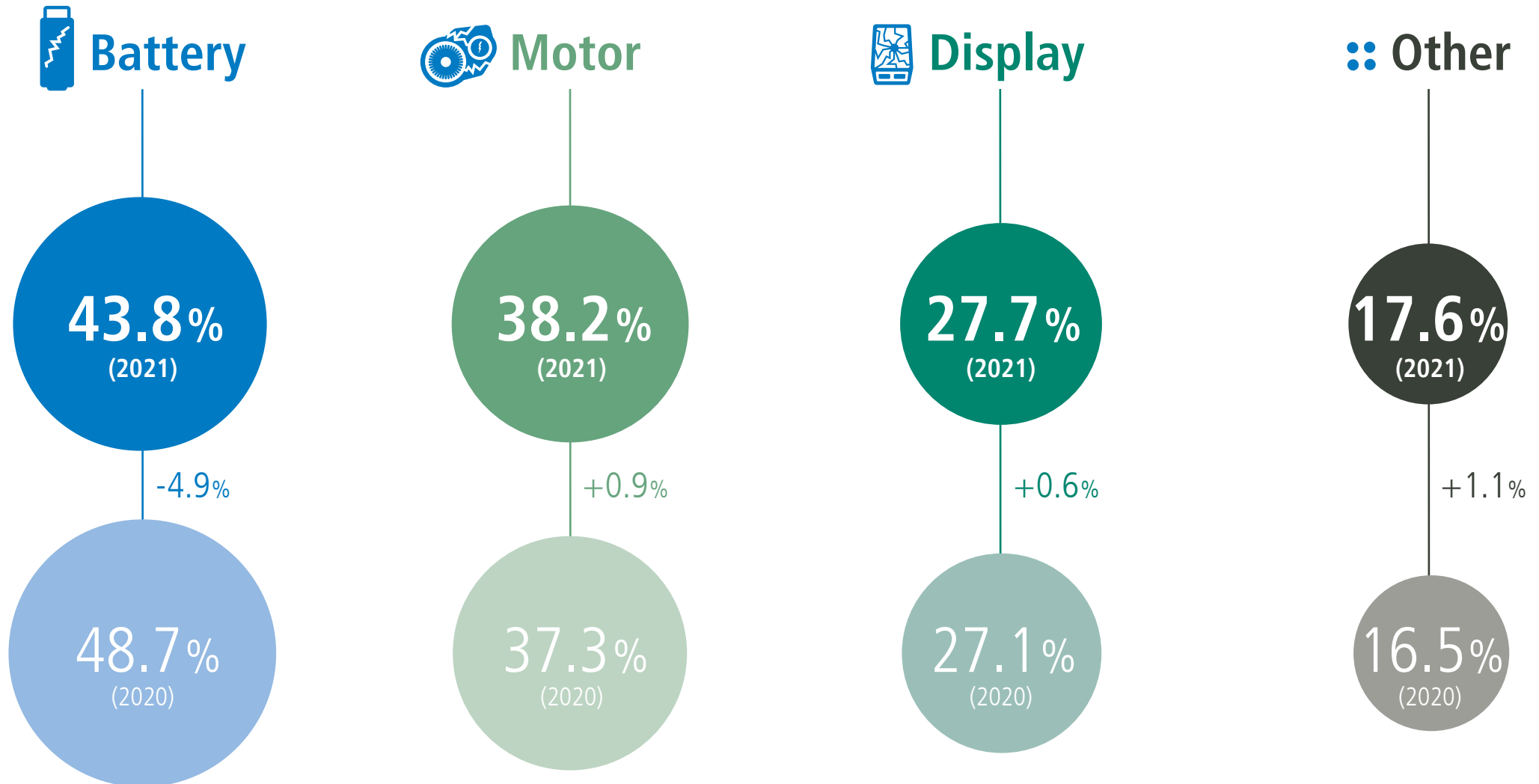
Components affected by technical defects

Battery technically less at risk than last year

Technical defects account for 22% of total damage. Although batteries are the number one source of technical defects, their share has fallen by 4.9% compared to the previous year. Also susceptible to failure: motor and display.

▶ n = 466 (2021)

▶ Multiple answers possible



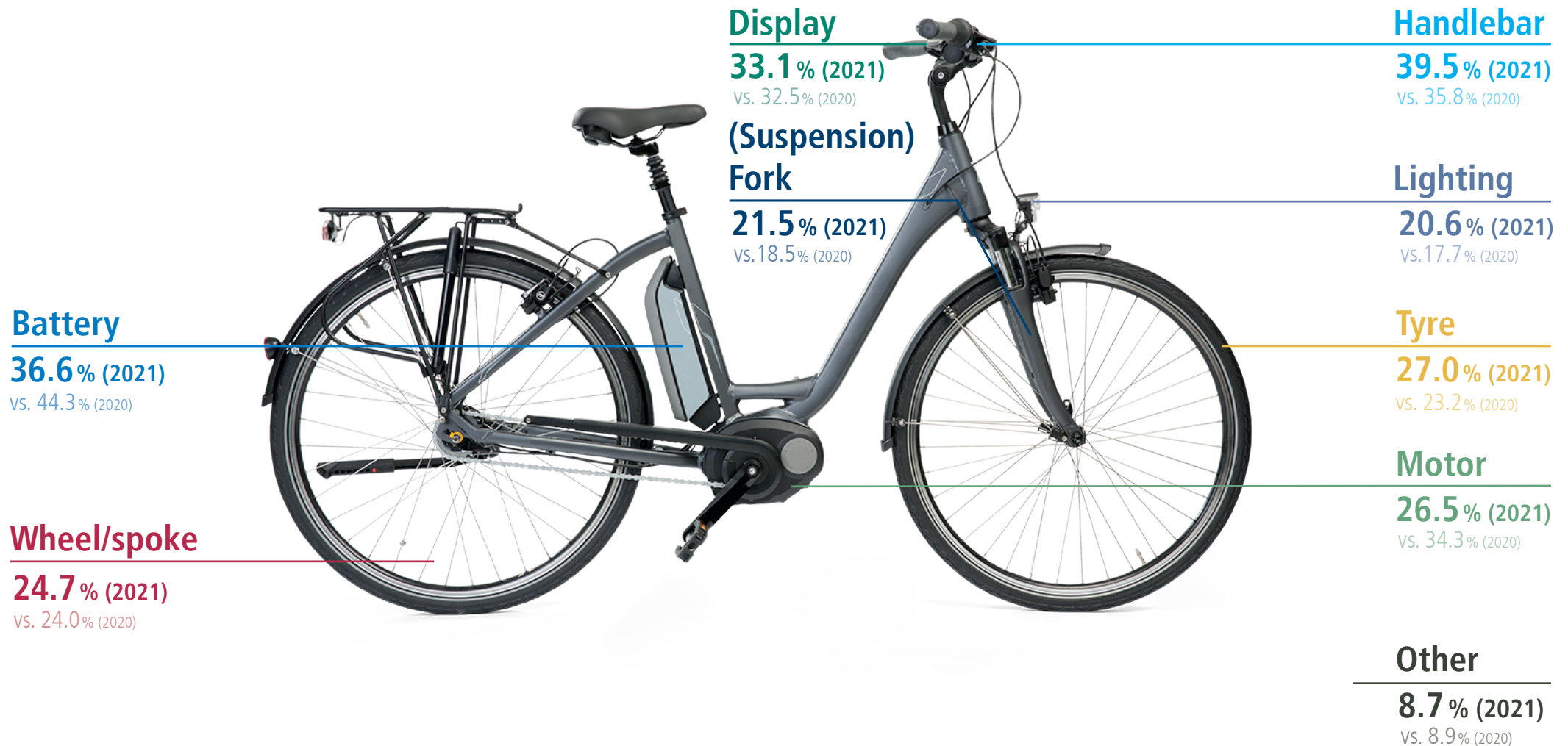
Accident-related damage to the e-bike

Handlebars most affected by accidents

16.4% of all damage is caused by accidents, 39.5% of which affects the handlebars, followed by the battery and display with 36.6% and 33.1% respectively.

▶ n = 271 (2021)

▶ Multiple answers possible



Battery

36.6% (2021)

vs. 44.3% (2020)

Wheel/spoke

24.7% (2021)

vs. 24.0% (2020)

Display

33.1% (2021)

vs. 32.5% (2020)

(Suspension)

Fork

21.5% (2021)

vs. 18.5% (2020)

Handlebar

39.5% (2021)

vs. 35.8% (2020)

Lighting

20.6% (2021)

vs. 17.7% (2020)

Tyre

27.0% (2021)

vs. 23.2% (2020)

Motor

26.5% (2021)

vs. 34.3% (2020)

Other

8.7% (2021)

vs. 8.9% (2020)

Theft frequency with e-bikes

Component theft increases significantly

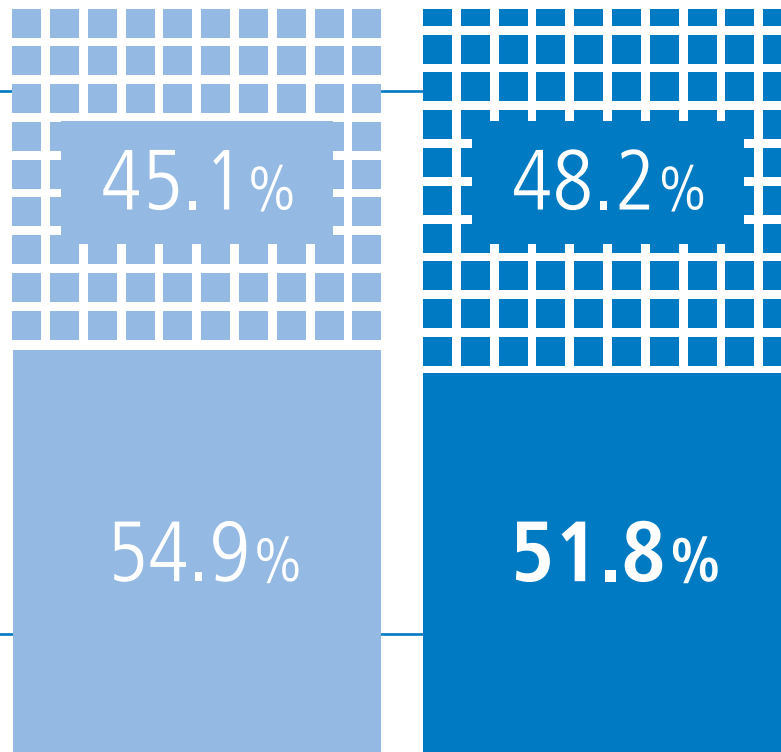
Bicycle theft causes a total of 5.8% of all damage. At 48.2%, components were much more popular with thieves than in the previous year, but the theft of complete e-bikes also increased to 51.8%.



Individual components of the e-bike were stolen.



The entire e-bike was stolen.



2020

2021

n = 85 (2021)



DAMAGE DISTRIBUTION:

Motors, batteries & displays

It is the motor, battery and display which make a bicycle an e-bike - and that is what makes the analysis of the distribution of damage to these components so interesting. Damage due to accidents as well as due to technical defects was taken into account here.

The frequency of damage depends to a large extent on the respective model of the component; motors and batteries in particular show a wide range of susceptibility to damage. The Yamaha PW-ST e-bike motor, for example, is only damaged 4.3 per cent of the time. The Giant SyncDrive Sport, Bosch Performance Line, Fischer Silent Drive and Bosch Active Line Plus motors are also robust. The Brose Drive S Mag mid-mounted motor and the Shimano Steps E6100 are different: both models have a damage frequency of over 40 per cent.

The batteries are similarly divergent. The front-runner Panasonic SF-06-S is only 4 per cent defective, followed by GIANT EnergyPak 500 and Yamaha Lithium Ion with defects well below 10 per cent. The Shimano BT-E8010, on the other hand, has a defect frequency of 24.1 per cent. The situation is even worse for the Shimano Steps BT-E8014: 65 per cent suffer damage, equally due to technical problems and accidents.

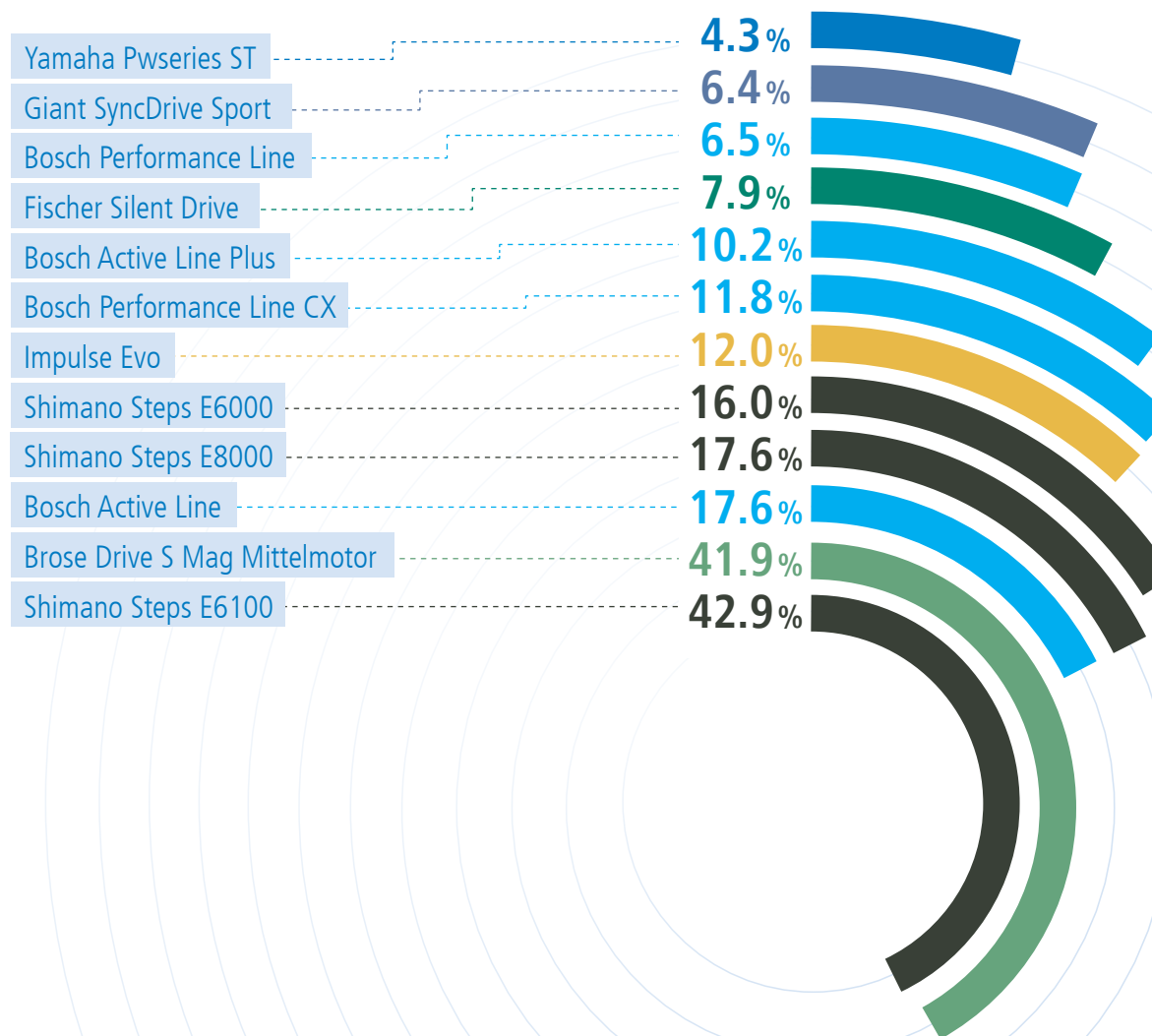
The damage frequency for e-bike displays is less pronounced, but still clear. Best rated is Bosch Kiox with 1.8 per cent damage, in the midfield Shimano SC-E6100 and Bosch Purion with 8.0 and 9.1 per cent defective devices respectively. Shimano has to concede defeat again, its SC-E7000 display shows clear weaknesses with 21.9 per cent.

Damage distribution for e-bike motors

Convincingly robust: Yamaha Pwseries ST

With only 4.3% of defective motors, the Japanese model scores well. Some motors from Giant, Bosch and Fischer are also very reliable. Clearly more susceptible: Brose Drive S Mag mid-mounted motor and Shimano Steps E6100 with over 40% each.

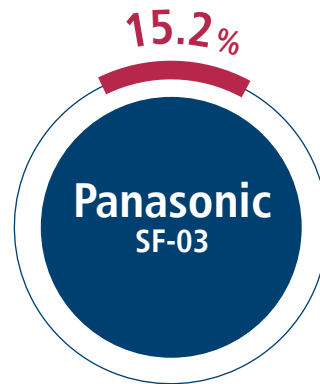
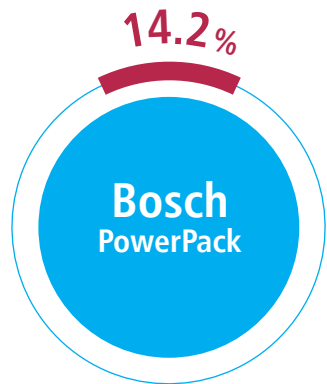
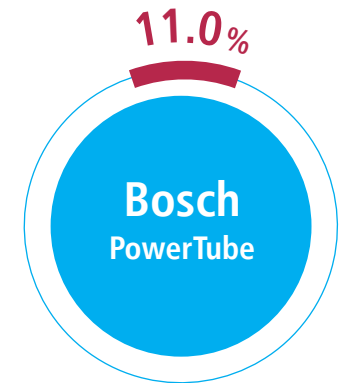
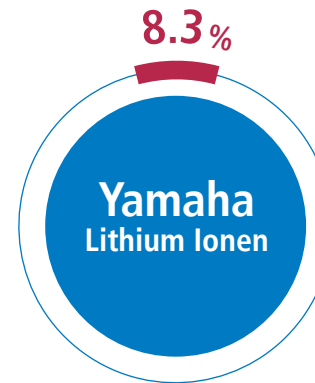
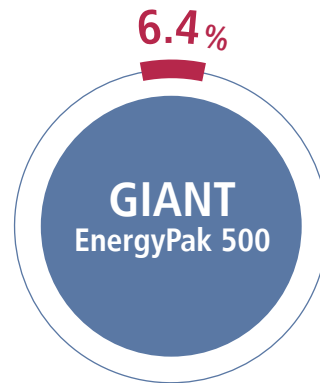
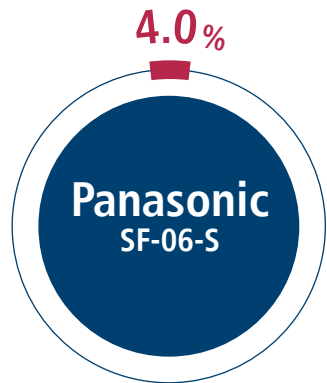
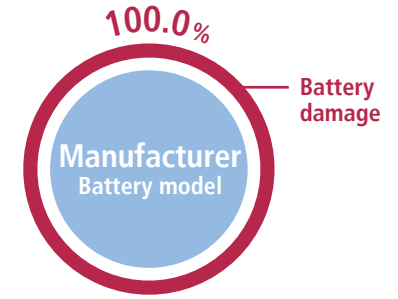
▶ Min. no. of respondents per motor: 20



Damage distribution for e-bike batteries

Panasonic SF-06-S is outstandingly stable

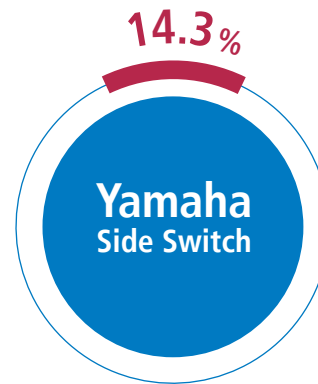
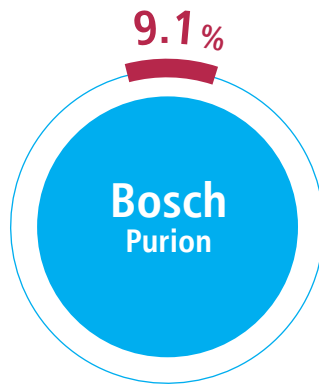
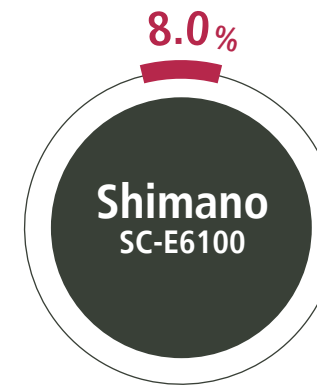
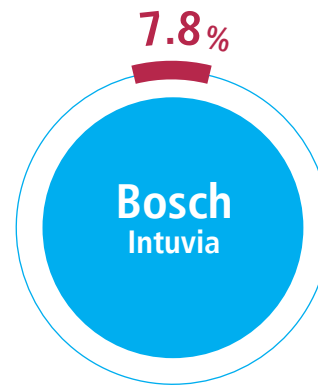
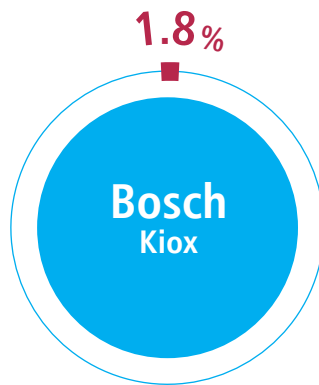
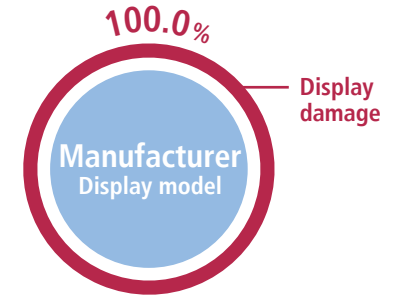
With a damage frequency of only 4%, these batteries are very robust. GIANT EnergyPak 500 and Yamaha Lithium Ion also prove their worth. Extremely vulnerable: Shimano Steps BT-E8014 with 65.0%.



▶ Min. no. of respondents per battery: 20

Damage distribution for e-bike displays
Bosch Kiox clear number 1

With a damage frequency of only 1.8%, this display proves to be extremely robust. Bringing up the rear once again: Shimano SC-E-7000 with 21.9%.



▶ Min. no. of respondents per display: 20

Security measures

The willingness to protect the e-bike against unauthorised access and damage is greater than ever before: almost all e-bikers surveyed use security measures. 1.1 per cent don't do so, whereby these are most likely MTB or road bike riders who only use their e-bike as sports equipment that is not left unattended anyway.

The general trend is towards high-quality locks: 43.2 per cent of users rely on the tried and tested chain lock. U-locks have fallen slightly out of favour, presumably because they are less flexible when connected to fixed objects and are also quite heavy. This is also confirmed by the fact that folding locks, which are not only secure but much more flexible, are used 3.8 per cent more often than in the previous year. The less secure spiral lock, on the other hand, is only used by 19.1 per cent of e-bike owners. The desire to protect oneself against technical defects and accidents has also increased significantly: by now, 36.8 per cent have a corresponding insurance policy.

In addition, the e-bike is more often safely stored indoors at night than in the previous year, more precisely by 91.5 per cent of users. In addition, the battery, which is one of the most expensive components of the e-bike, is removed and taken indoors significantly more often than in the previous year. 42.9 per cent leave the battery on the e-bike, although it should be noted that more and more batteries are integrated into the frame and thus automatically protected against theft.

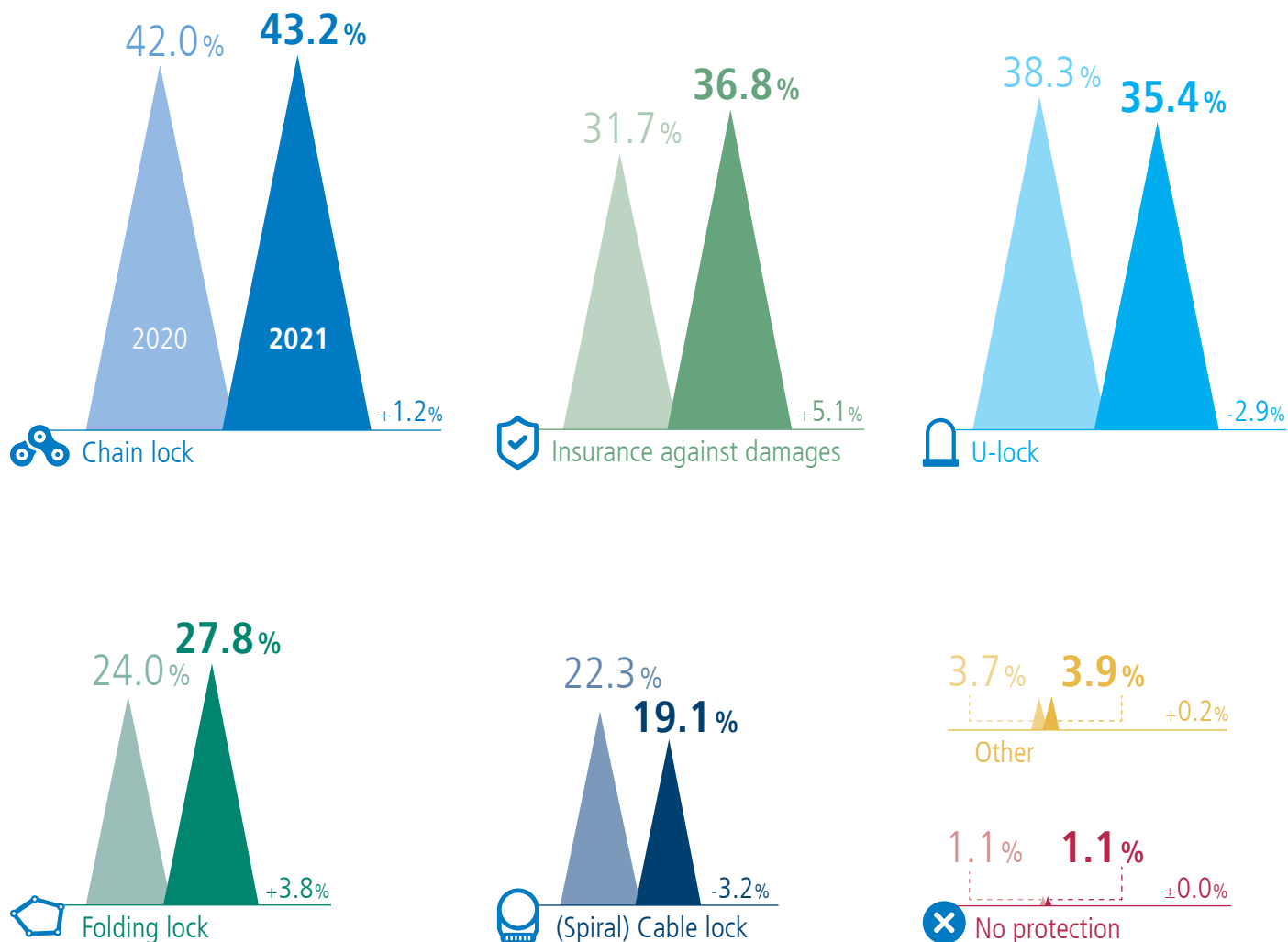
Securing the e-bike

Particularly popular: high-quality locks and insurance

Users increasingly trust solid chain or folding locks. In addition, significantly more insurance policies against damage have been taken out. On the decrease: spiral locks.

▶ n = 2,098 (2021)

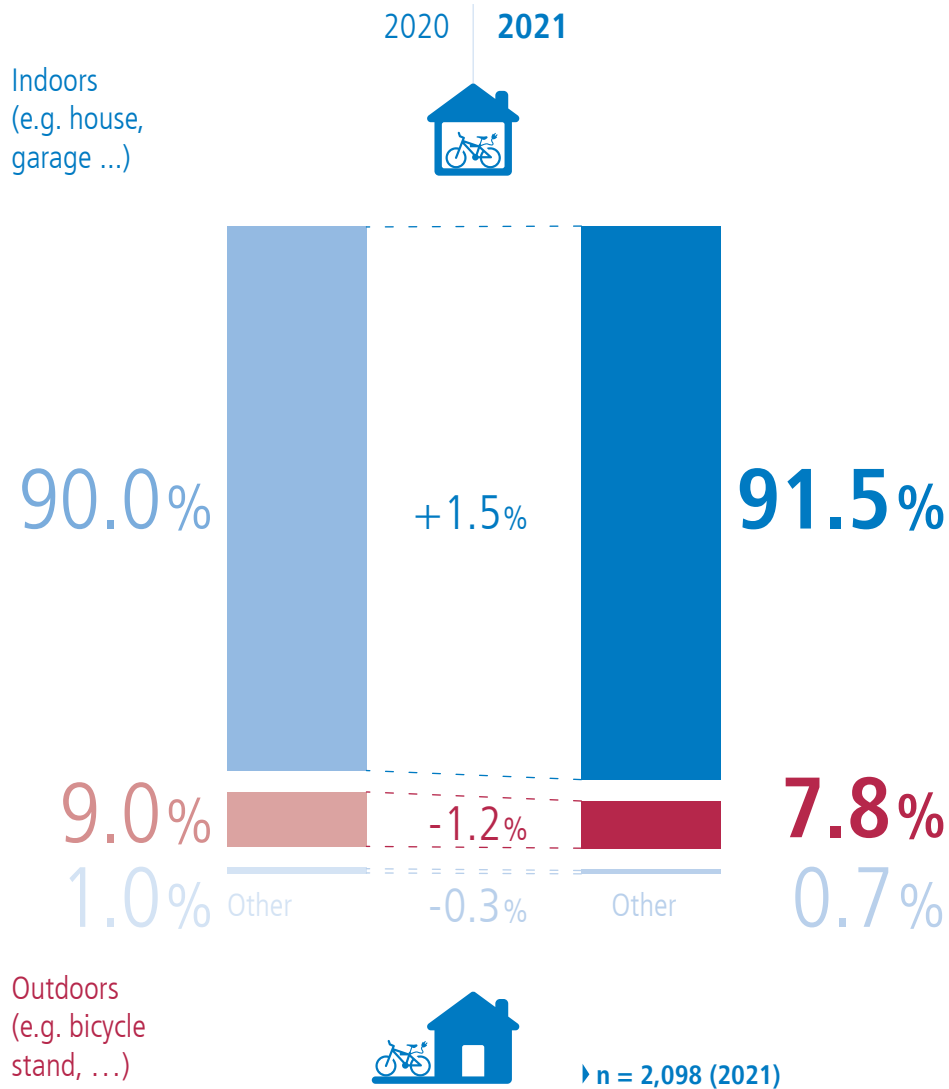
▶ Multiple answers possible



Overnight parking

E-bikes mostly spend the night indoors

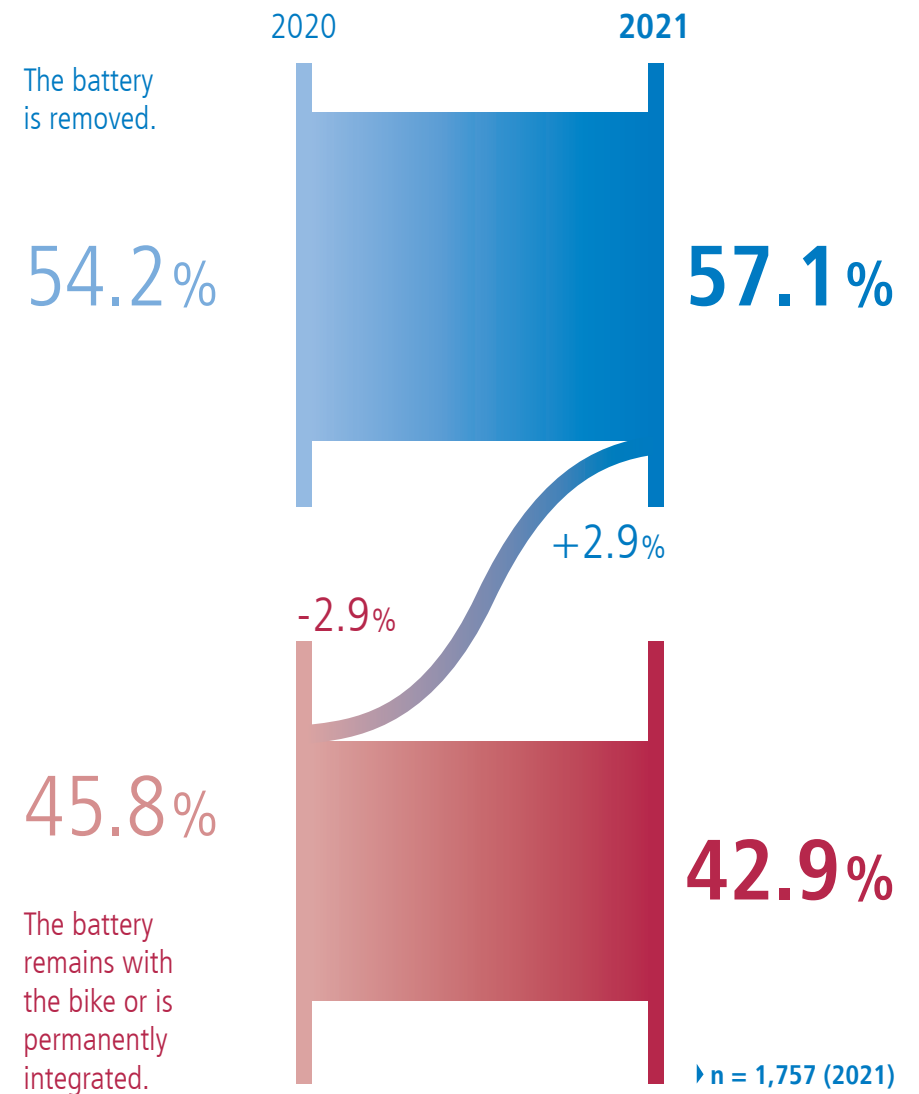
The trend towards secure storage is on the rise: more than 9 out of 10 e-bike owners park their bikes indoors, in their garage, etc. at night.



Securing the e-bike battery

Battery stays on the bike less often

By now, 57.1% of all users remove the battery, 2.9% more than last year. No wonder - after all, it is one of the most expensive components.



REPAIR BEHAVIOUR:

Self-repair vs. bicycle workshop

The willingness to get one's hands dirty in case of a defect is still high. 44.9 per cent, i.e. almost half of all users, repair e-bike components themselves as much as they can. On the other hand, the number of those who repair their e-bike completely themselves has fallen: only 17 per cent, and thus 6.1 per cent less than in the previous year, do completely without professional support. Almost three quarters of this group are male and the majority (50.6 per cent) are between 30 and 39 years old. However, women up to 29 years of age set the record in terms of complete self-repair with 55.9 per cent.

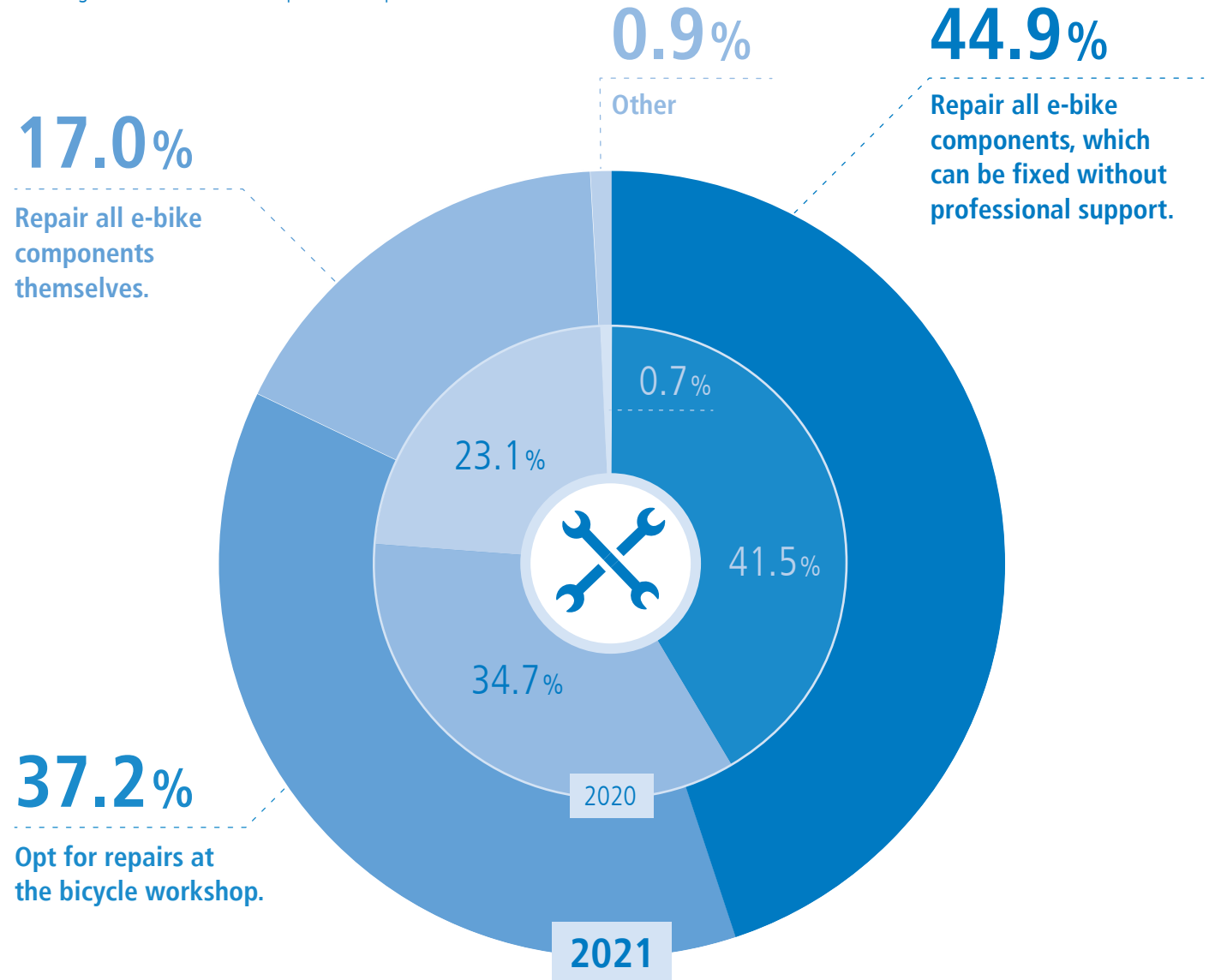
One reason for the lower figures regarding complete self-repair could be the fact that e-bike components such as the battery are more often permanently integrated and therefore more difficult to access, or that additional special tools are needed for a repair. On the other hand, the desire for professional repair has increased: 37.2 per cent of respondents use the services of a bicycle repair shop in case of damage; 2.5 per cent more than in the previous year.

How are damages repaired?

Bicycle repair shops more in demand

At 44.9%, many users repair their bikes partially themselves, 37.2% rely on professional repair, and the trend is rising. Declining: the trend towards complete self-repair.

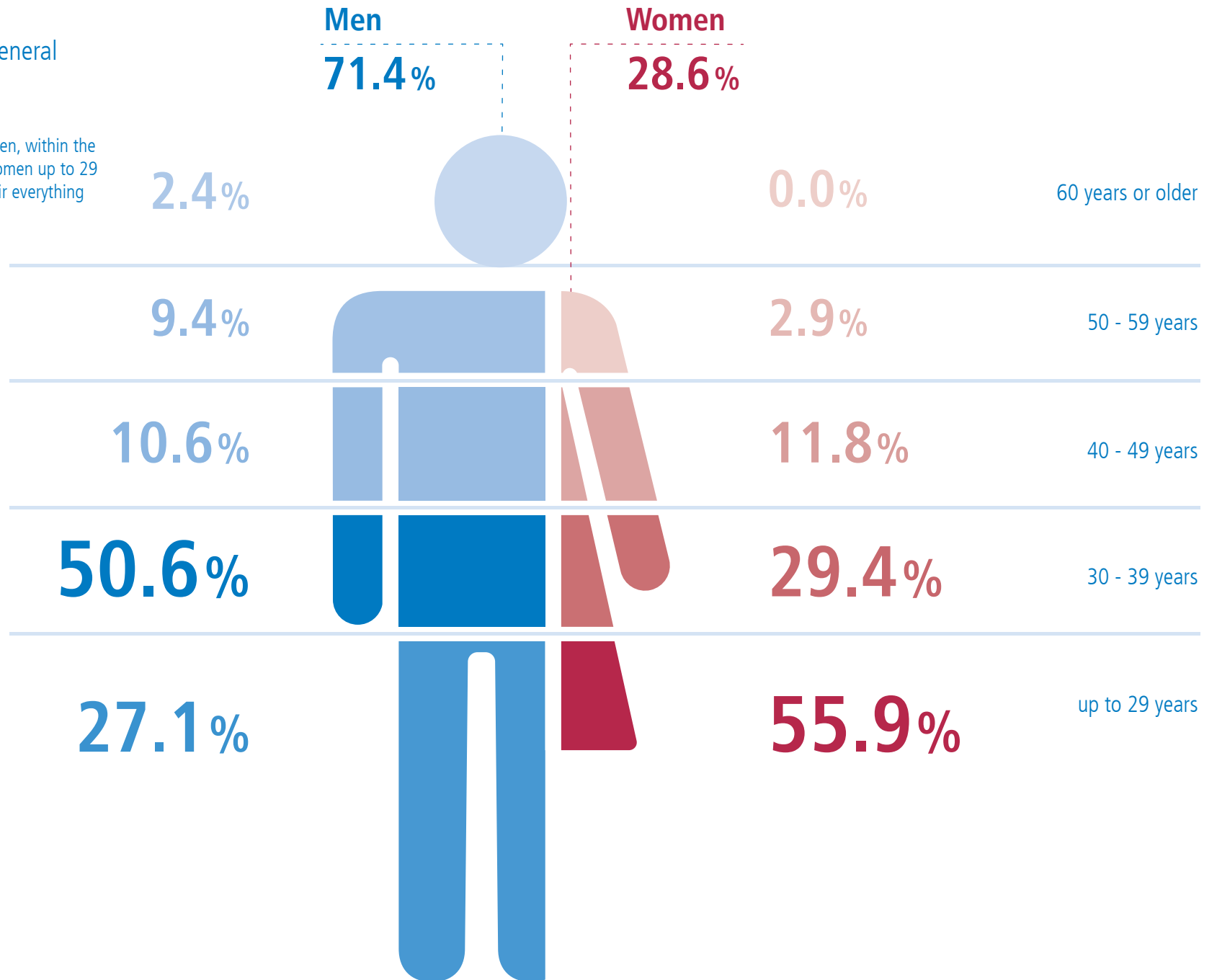
n = 699 (2021)



Complete self-repair

Most willing to repair: men in general and women under thirty

Almost three quarters of self-repairers are men, within the 30 - 39 age group being the most active. Women up to 29 years old achieve the top value: 55.9% repair everything on the e-bike themselves.



REPURCHASE PROBABILITY AND SATISFACTION:

Motors, batteries & displays

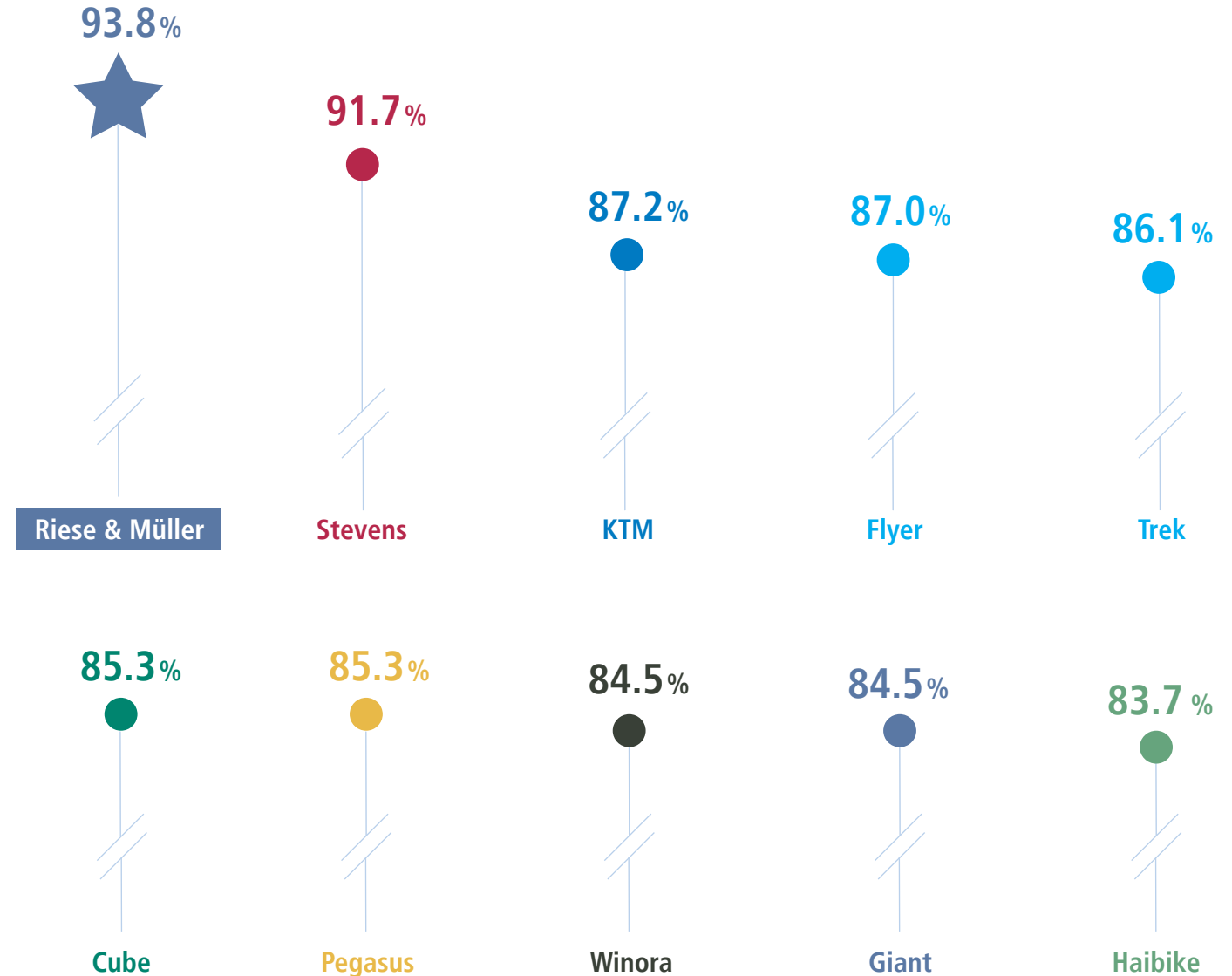
No value expresses the satisfaction of users with their e-bike brand as strongly as the likelihood of repurchase: among the ten best manufacturers, Riese & Müller is in first place with 93.8 per cent, followed by Stevens and KTM with 91.7 and 87.2 per cent respectively. Satisfaction with the motor, battery and display was examined separately.

Gazelle Arroyo C7 HMS (2017) and the ladies' model of the Diamant Achat Deluxe+ (2019) achieved first place in the motor rating with 88 per cent. The Bergamont E-Contrail 6.0 Plus (2018) has the least customer loyalty here with only 69 per cent.

When it comes to battery range, however, this Bergamont model redeems itself: with 83.3 per cent repurchase probability, it is in second place. Diamant Achat Deluxe+ and Gazelle Arroyo C7 HMS score high again and are in first and third place. All three models are often equipped with Bosch batteries, which were generally rated as high quality by respondents to this study. Models from Fischer, Cube and Bianchi fared significantly worse. Only 77.1 per cent of users would remain loyal to the Bianchi E-SUV Rally (2020). One possible reason for the battery dissatisfaction could be that this e-mountain bike requires relatively high battery power for off-road rides. This reduces the actual range enormously - and often contradicts the manufacturer's specifications on the distance that can be achieved with one battery charge.

Top 10: Repurchase probability by manufacturer Riese & Müller most popular

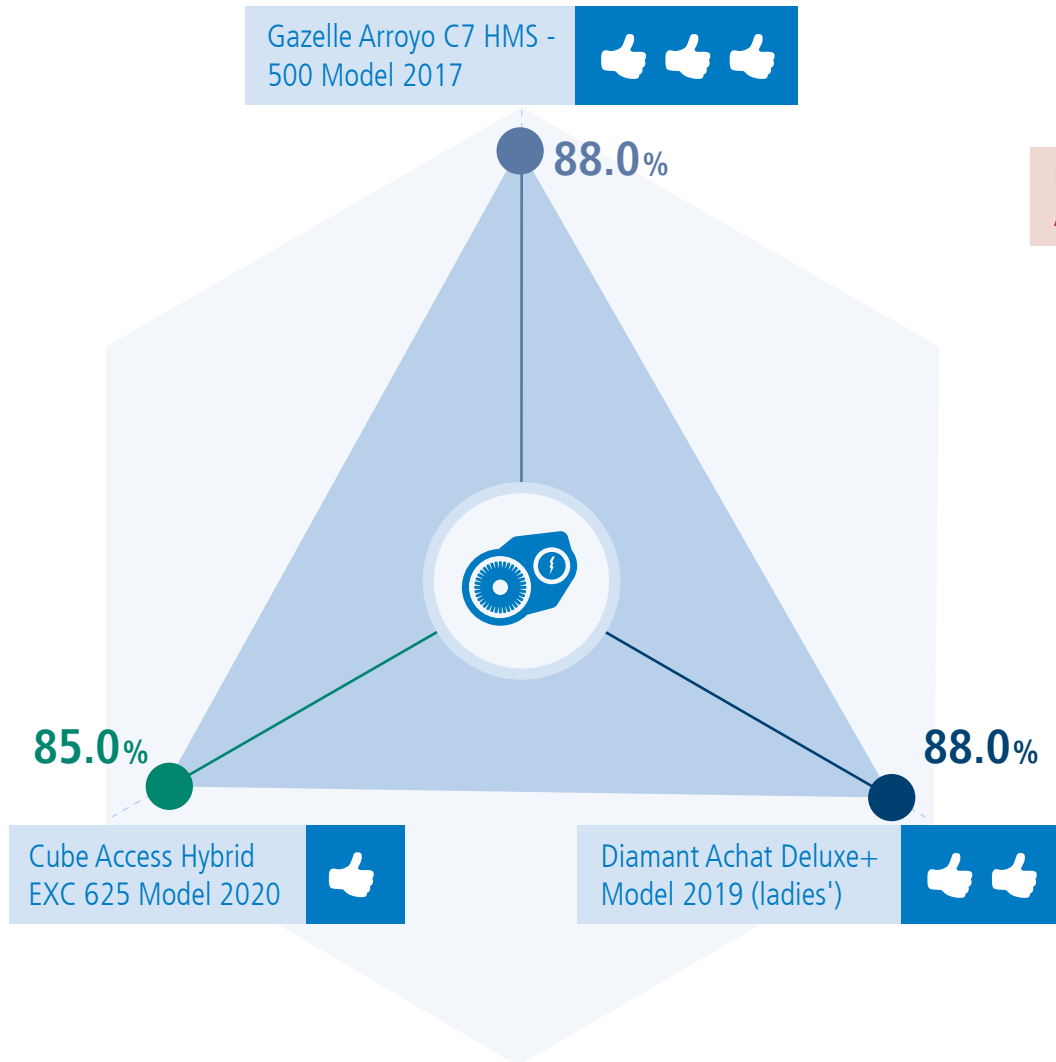
Almost 94% of users would buy an e-bike from this company again, but satisfaction with Stevens, KTM and many other manufacturers is also high.



Top 3: Satisfaction with the motor

Dual leadership: Diamant and Gazelle

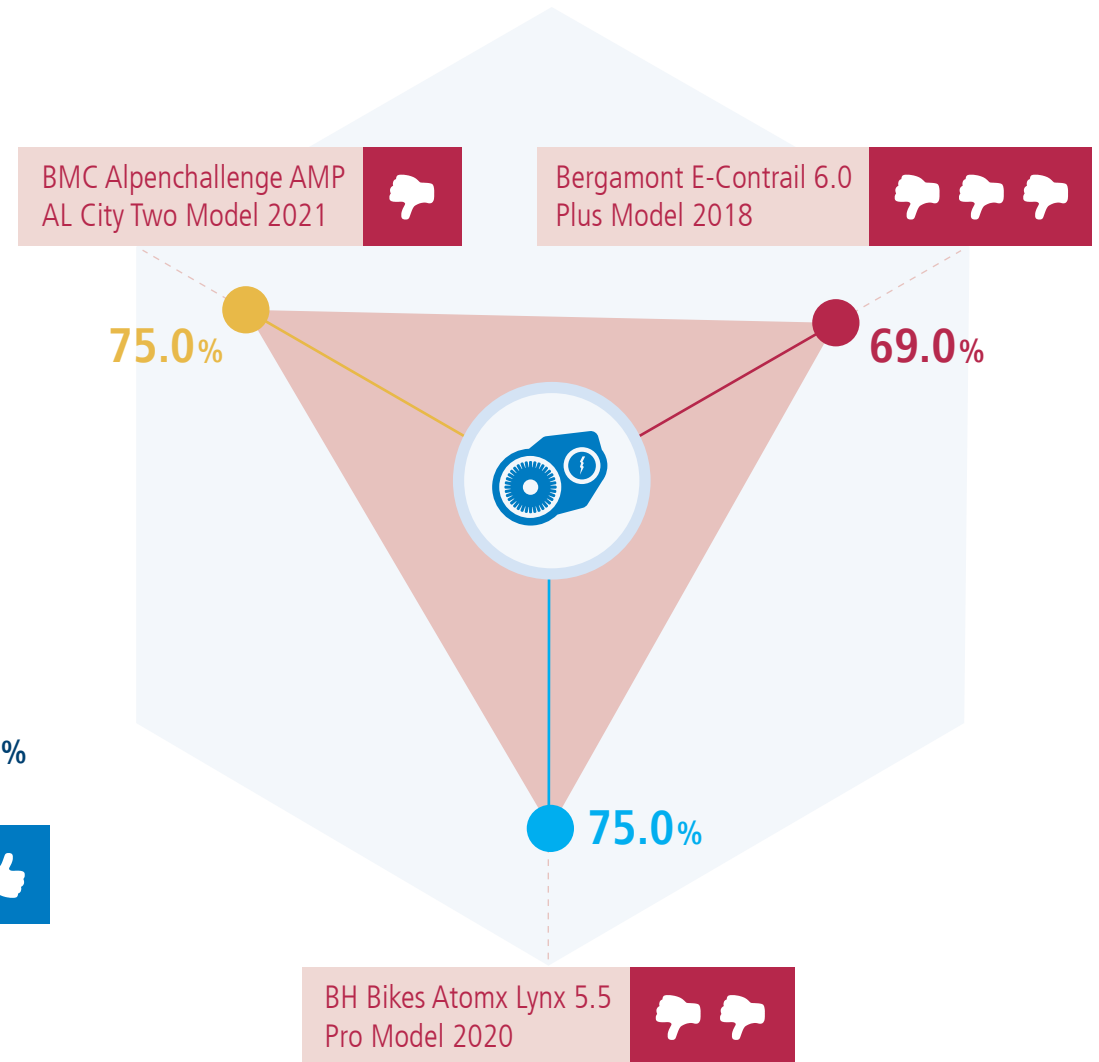
With 88% motor-related customer satisfaction, Diamant Achat Deluxe+ and Gazelle Arroyo C7 HMS - 500 score well, as does the Cube Access Hybrid EXC 625 with 85%.



Flop 3: Satisfaction with the motor

Disappointing results for Bergamont

Only 69% of users see their expectations fulfilled with the motor of the Bergamont E-Contrail 6.0 Plus. BMC Alpenchallenge AMP AL City Two and BH Bikes Atomx Lynx 5.5 leave users dissatisfied.



Top 3: Satisfaction with the battery range

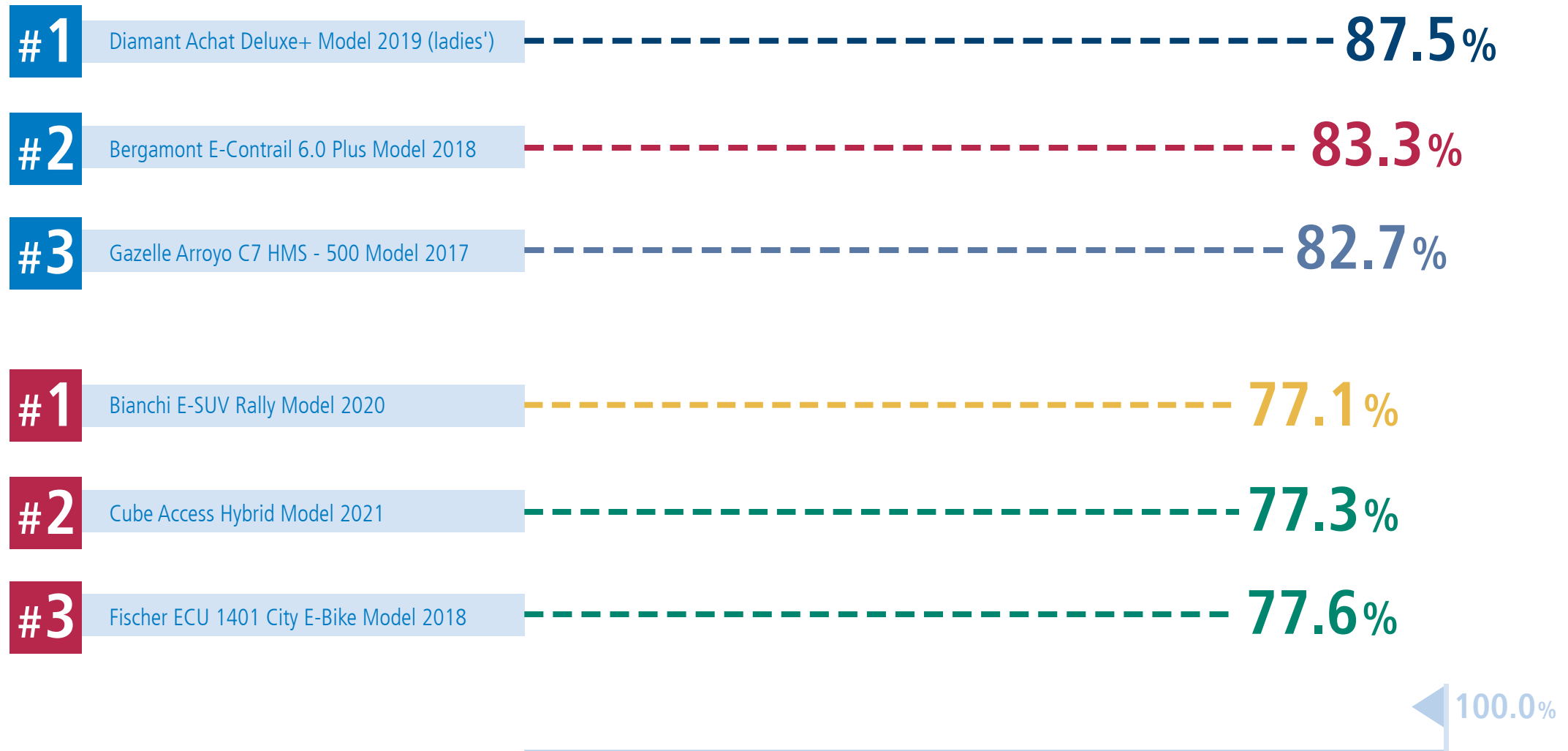
Diamant is eating up the kilometres

The ladies' model of Diamant Achat Deluxe+ impresses 87.5% of users in terms of range, followed by Bergamont E-Contrail 6.0 Plus and Gazelle Arroyo C7 HMS - 500.

Flop 3: Satisfaction with the battery range

Less impressive: Bianchi, Cube and Fischer

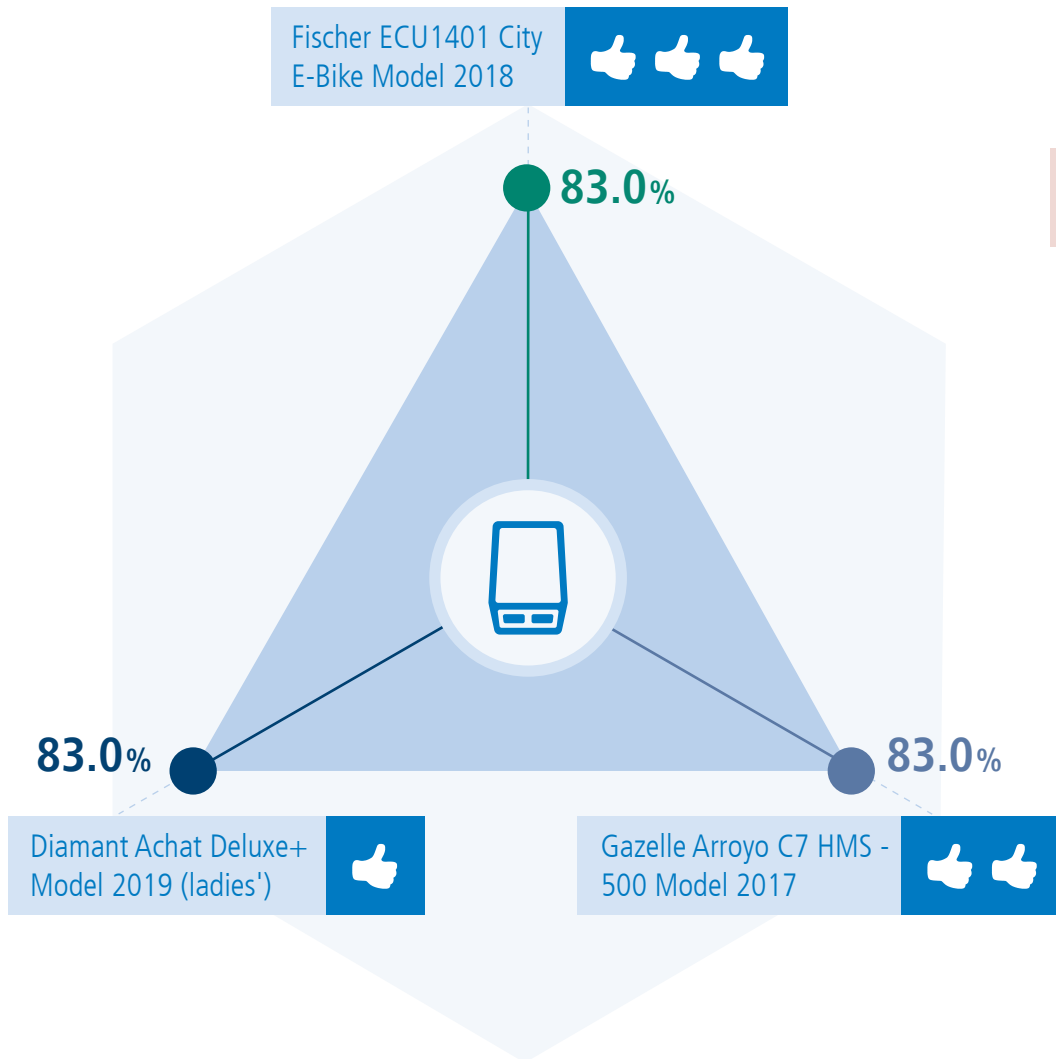
With approx. 77%, the range of the Bianchi E-SUV Rally, the Cube Access Hybrid and the Fischer ECU 1401 City E-Bike could only satisfy a good three quarters of the users.



Top 3: Satisfaction with the display

Fischer, Diamant and Gazelle right at the top

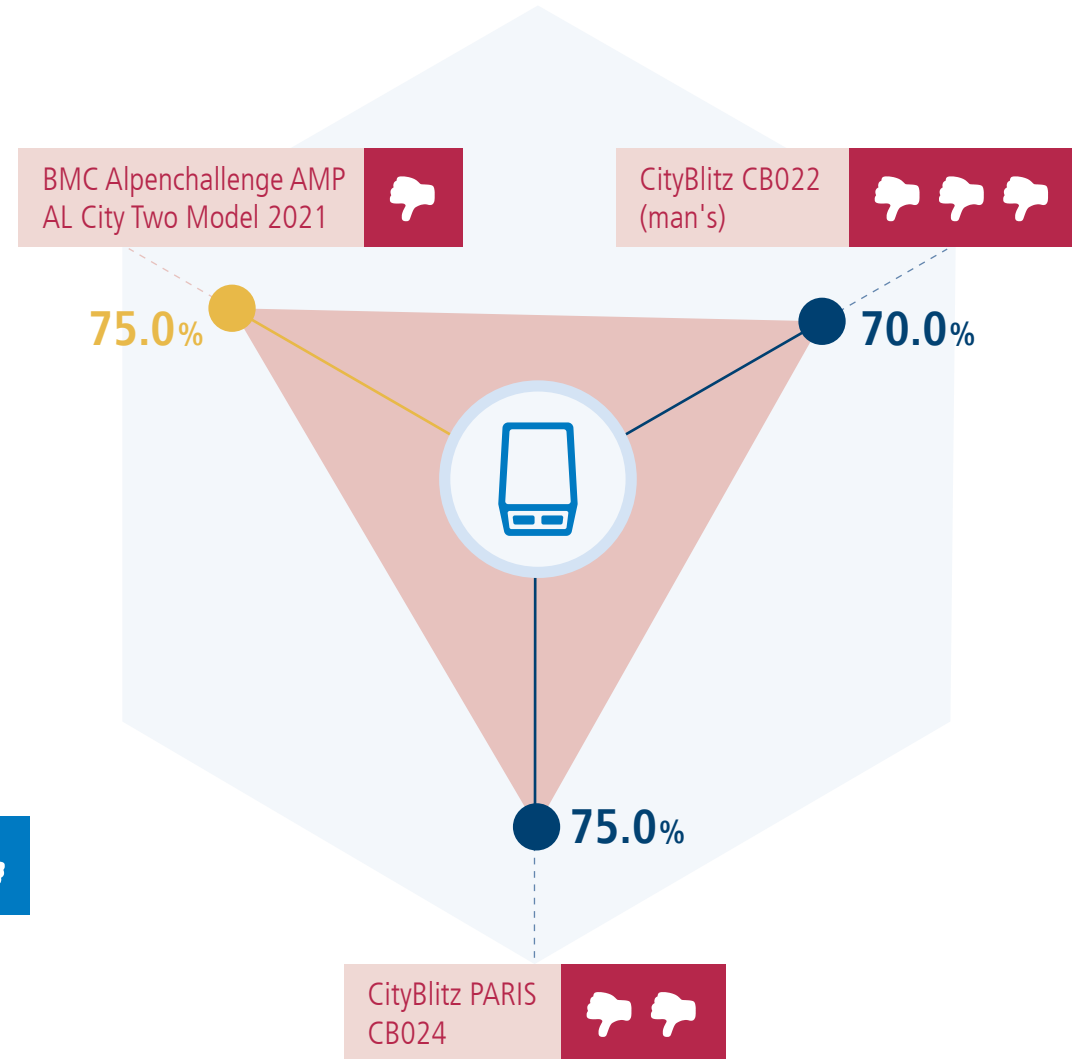
In addition to the perennial winners Diamant Achat Deluxe+ and Gazelle Arroyo C7 HMS - 500, the display of the Fischer ECU 1401 City E-Bike is also at the very forefront. All three manufacturers would be bought again by 83%.



Flop 3: Satisfaction with the display

CityBlitz brings up the rear

Only 70% of the users appreciate the display of the man's CityBlitz CB022. CityBlitz PARIS CB024 BMC and Alpenchallenge AMP AL City Two only receive 75% positive votes.



IN THE SPOTLIGHT:

The e-bike users

In the results of the survey on e-bike users, there were quite a few changes compared to the previous year, some of which were striking. For example, the gender distribution of e-bike riders has shifted by almost 5 per cent, so that the share of men is now 58.4 per cent. The survey participants are broadly based in terms of age structure, with over a quarter of users aged between 30 and 39 years old. The growth of the under 29 age group is remarkable: with an increase of 5.8 per cent, this now forms the second strongest fraction. Here we can assume that cycling has also become a distraction for younger people due to the restrictions imposed by COVID.

This theory is also supported by the fact that more than 80 per cent of the respondents use their e-bikes for leisure / fun. As a sports device, the e-bike is now used by 68.6 per cent, which corresponds to an increase of 7.2 per cent compared to the previous year.

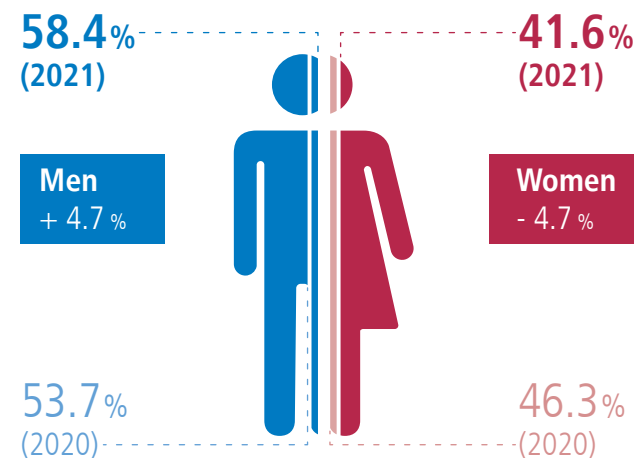
Regarding the frequency of use, well over half of the respondents use the e-bike several times a week, but only one in five rides it daily. Here, too, there could be a connection to the current situation, because for many people the commute to work is no longer necessary as they work from home. This would also explain why the previously most travelled annual distance of up to 500 kilometres has fallen by 6.3 per cent and is now in third place. More than 30 per cent of the respondents now travel up to 1,000 kilometres annually, a good quarter even more than 2,000 kilometres.

E-bike users / gender

Proportion of men has increased significantly

The majority of e-bikers are now male. The share of women is 41.6%; in the previous year, 46.3% of e-bikers were female.

▶ n = 2,098 (2021)

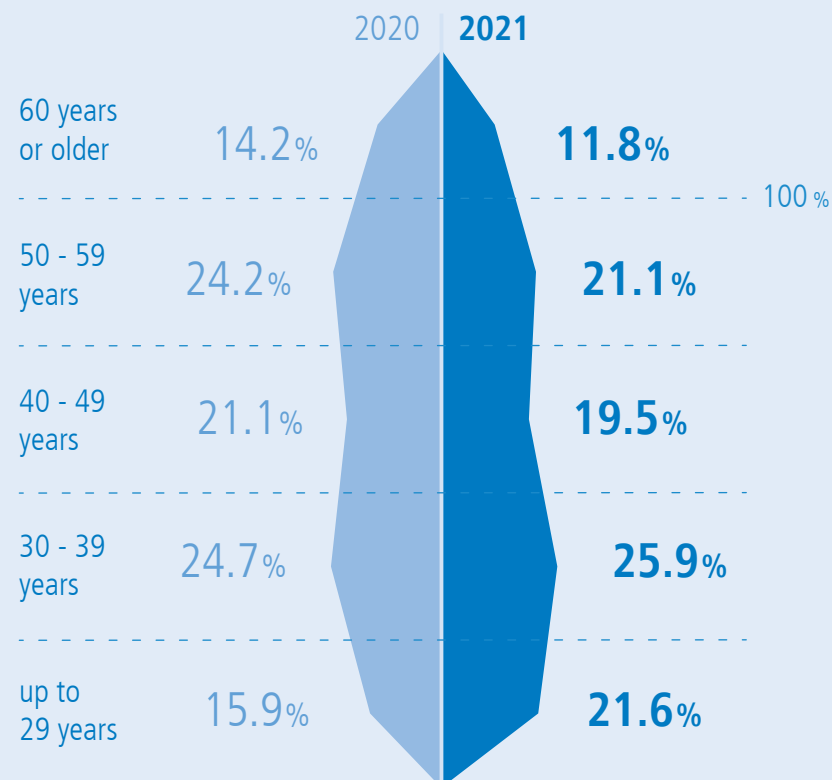


E-bike users / age

Almost half of all drivers surveyed are under 40

With 25.9%, the age group 30 - 39 years is most strongly represented. Striking: the number of drivers under 29 increased by a significant 5.8%, while the number of those over 50 decreased.

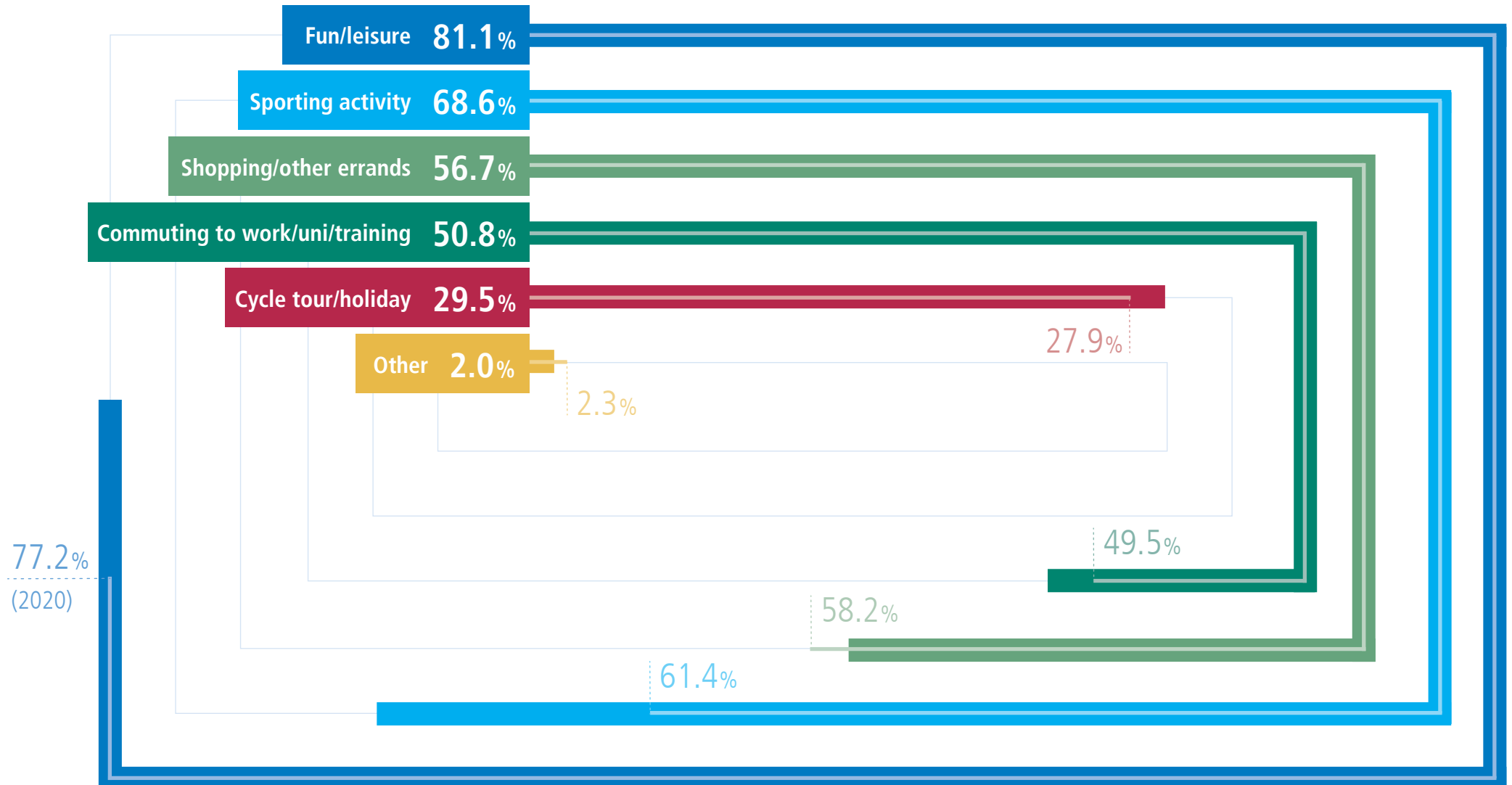
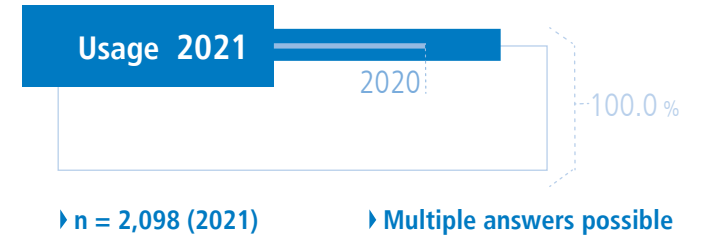
▶ n = 2,098 (2021)



What is the e-bike used for?

Increasing relevance in terms of sport and recreation

81.1% use the e-bike for leisure activities. As sports equipment, 7.8% more riders use it than in the previous year. Only 29.5% use it for cycling trips or holidays.

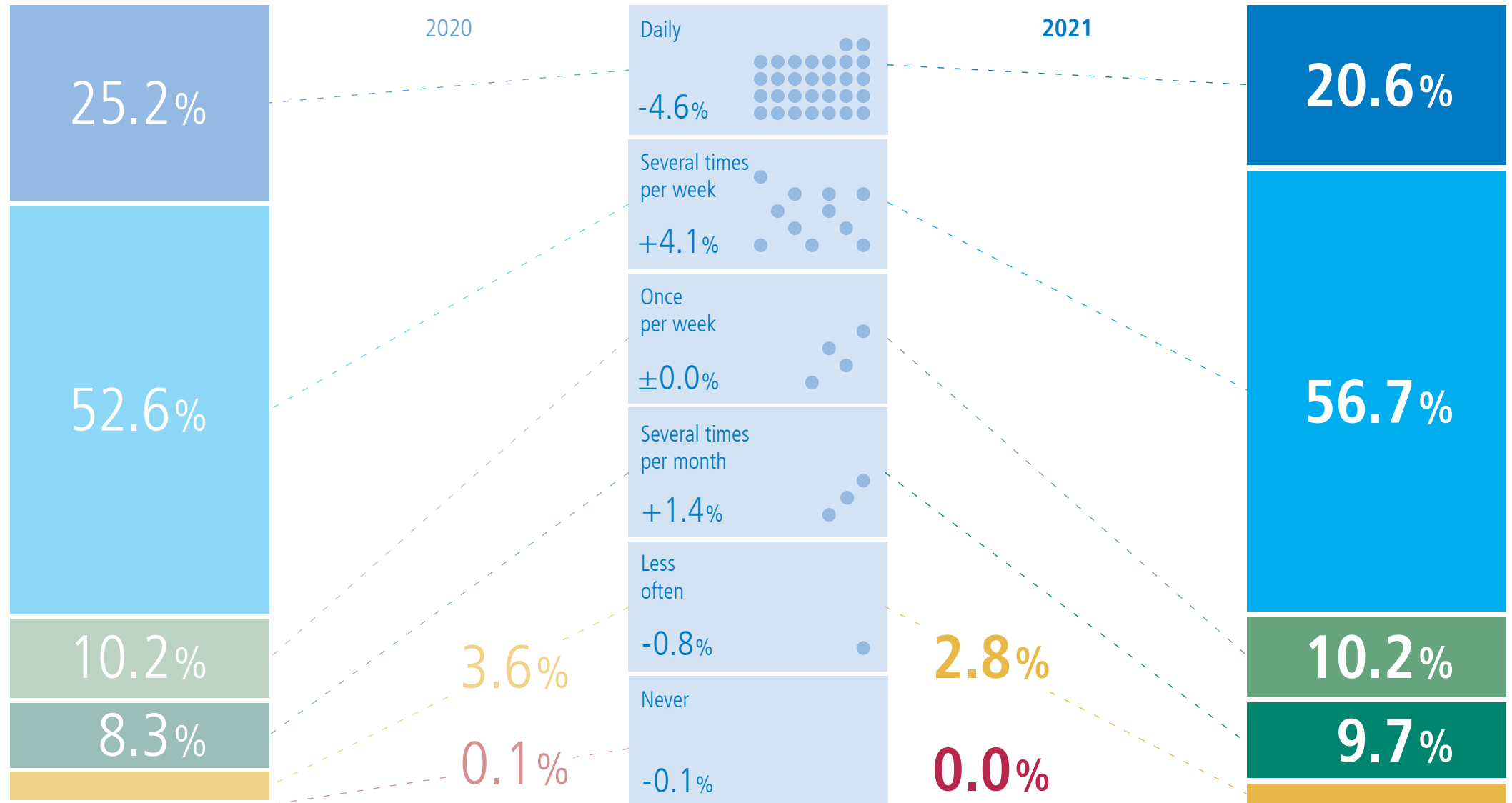


How often is the e-bike used?

Daily use declining

The majority of respondents (56.7%) ride several times a week, only one in five currently uses their e-bike daily - 4.6% less than in the previous year.

▶ n = 2,098 (2021)

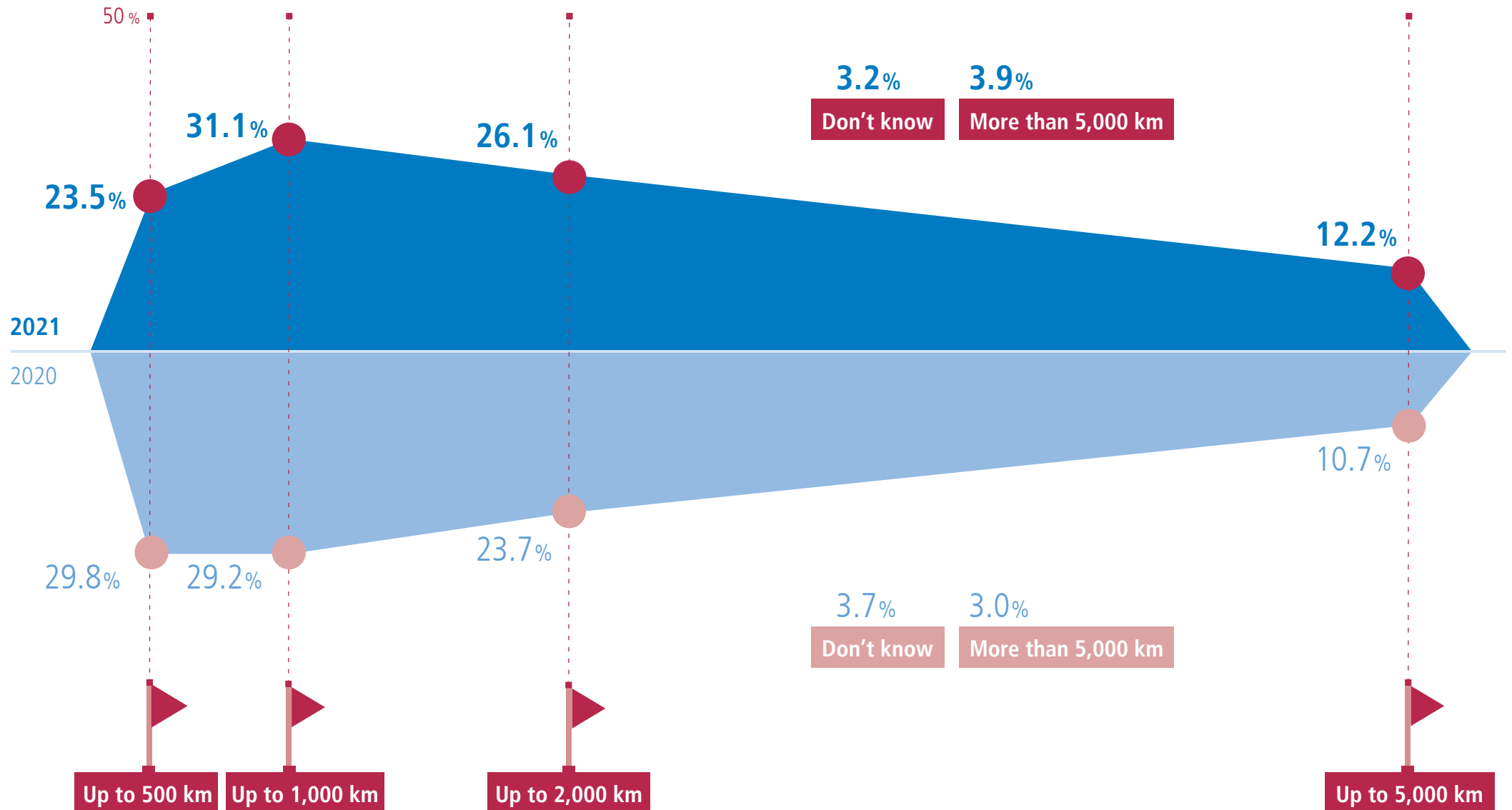


Routes travelled annually:

Nearly a quarter travel up to 2,000 kilometres

The majority of users travel 1,000 kilometres per year, 12.2% even 5,000. Fewer users travel 500 kilometres annually.

n = 2,098 (2021)

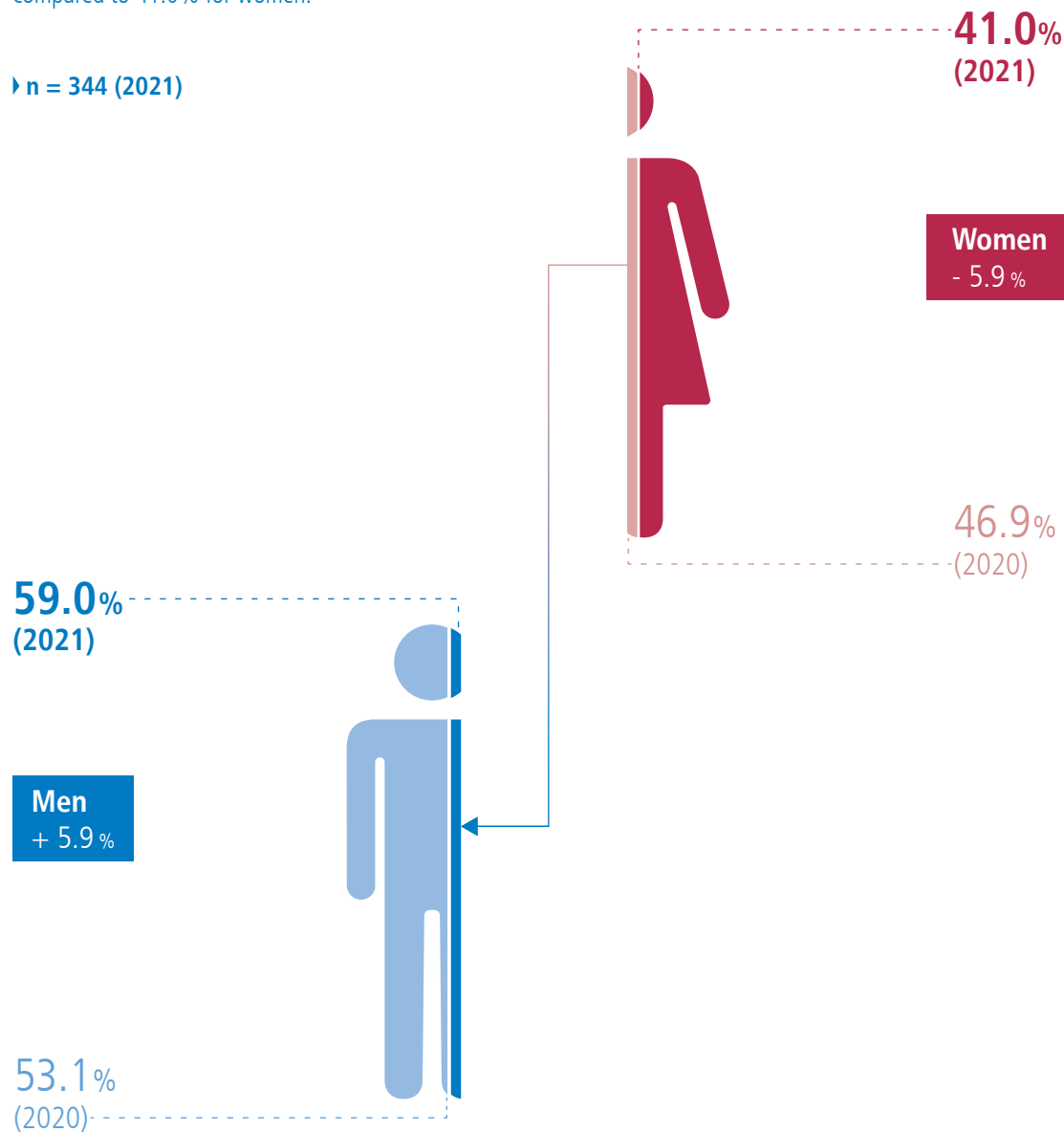


Frequency of accident-related damage / gender

Men considerably more often involved in accidents

Men now cause 59.0% of accident-related damage, compared to 41.0% for women.

▶ n = 344 (2021)

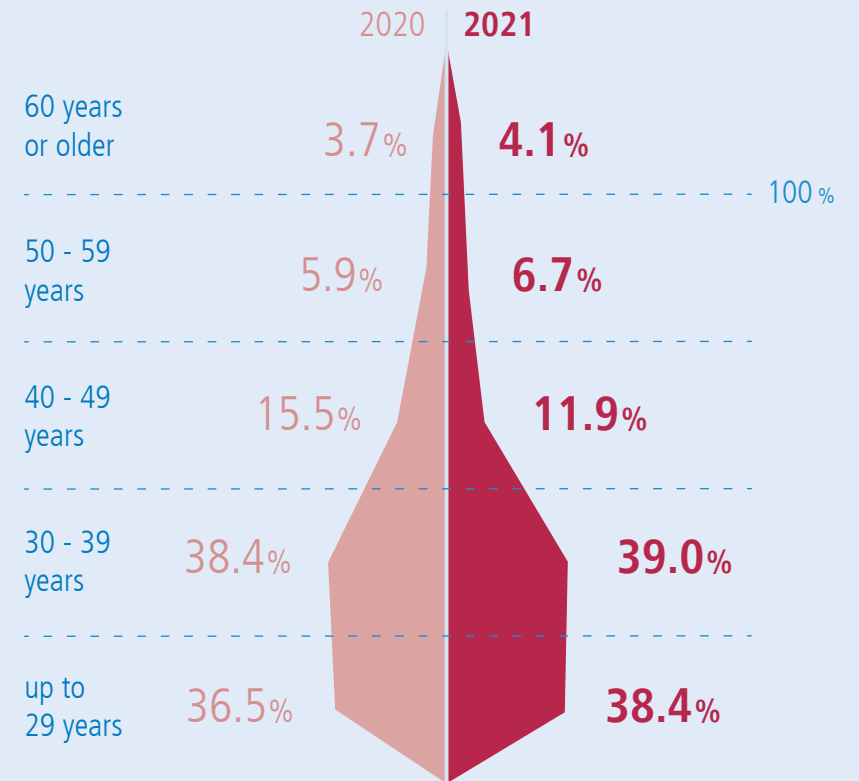


Frequency of accident-related damage / age

Drivers under 40 increasingly at risk

Almost 80% of accident-related damages to e-bikes is caused by riders up to 39 years of age; the probability of accidents is significantly lower for the other age groups.

▶ n = 344 (2021)



Damage frequency by federal state

Hot spots: city states lead the way in terms of damage frequency

Berlin and Hamburg, in particular, have very high damage rates of almost 50%, followed by Bremen with 38.1%. Least affected: e-bikes in Saarland with only 19.6%.

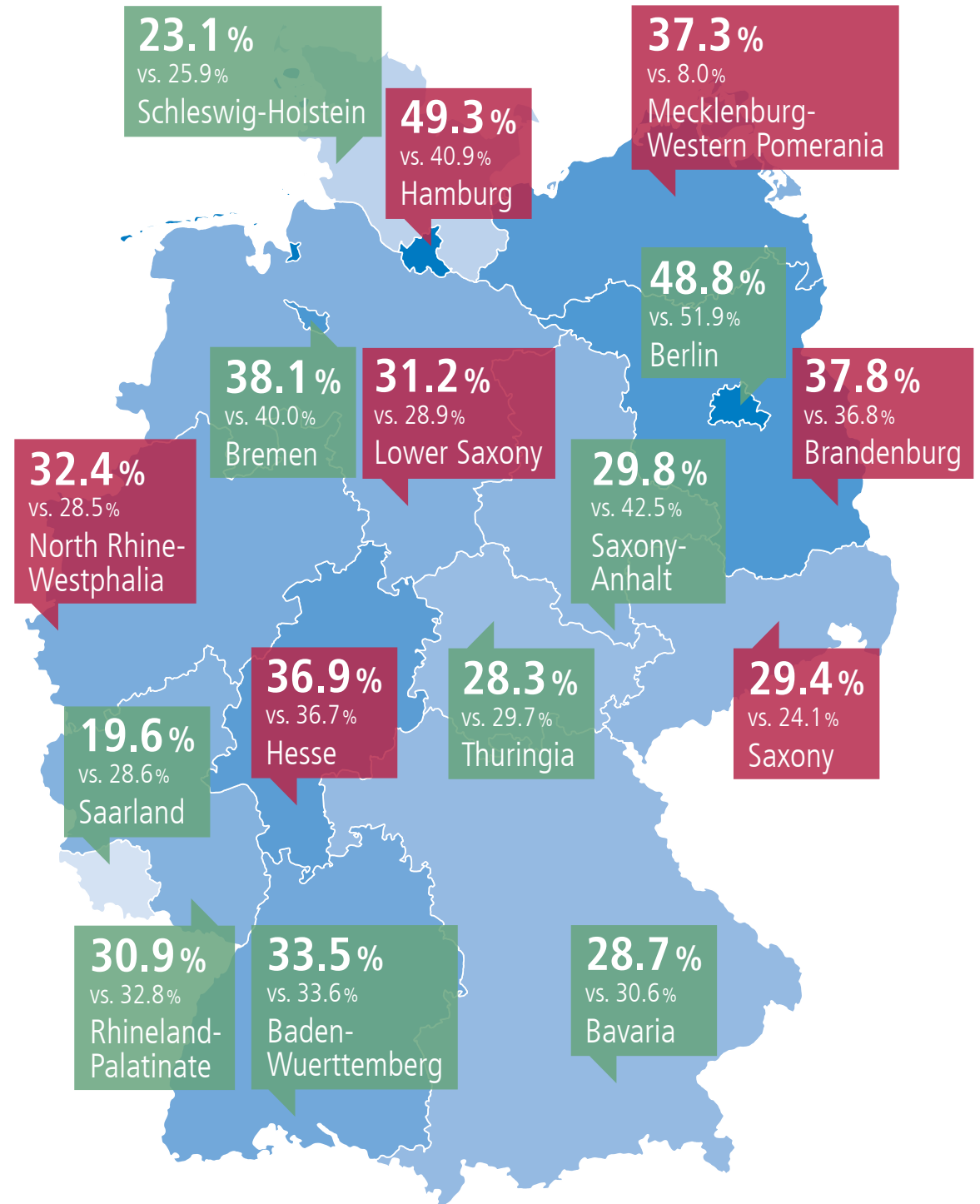
100 %

► The darker a German state, the more survey respondents have had an e-bike damage.

■ Federal states with **less** survey participants with e-bike damage compared to the previous year.

■ Federal states with **more** survey participants with e-bike damage compared to the previous year.

0 %



► n = 1,244

REPAIR INDEX:

The e-bike ranking

In this ranking, manufacturers are assessed in the form of top 5 lists, both via an overall score and in terms of repair susceptibility and costs. The top suppliers all performed very well, whereby it is noticeable that the top-rated manufacturers are consistently and recurrently well-known brands from the medium to higher price range.

In terms of the overall score, Raleigh and Flyer share first place with a score of 1.3, followed by Kalkhoff, Pegasus and Stevens with 1.4 each. Even more remarkable are the results with regard to susceptibility to repair: no less than five manufacturers receive the best mark of 1 for robustness here, specifically Raleigh, Flyer, Pegasus, Stevens and Cube. The scores for low repair costs are also in the highest range: Raleigh leads with a score of 1.6, followed closely by Flyer and Kalkhoff with 1.7. The repair costs of Winora and Pegasus are rated very positively as well with 1.8.

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/pedelecs insured by WERTGARANTIE. The ranking is updated each quarter, so the figures online always represent the latest ones.

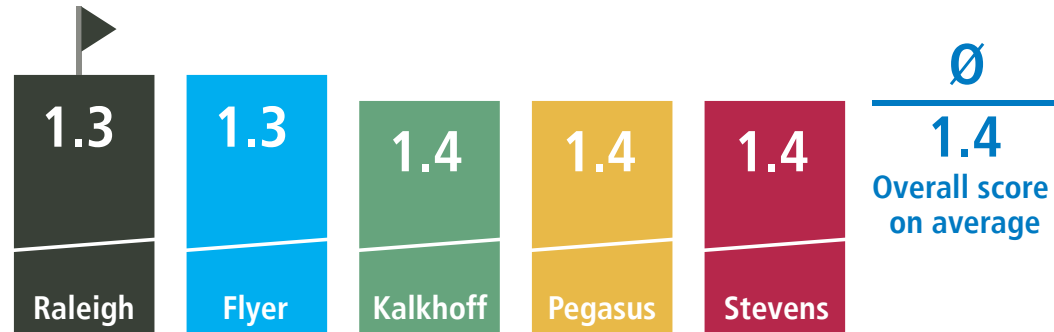
▸ As per: Q1/2021

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

Overall score of the five best manufacturers*

Raleigh and Flyer rated best

A real neck-and-neck race: Raleigh and Flyer take the top spot with a score of 1.3, Kalkhoff, Pegasus and Stevens each receive a 1.4.



Need for repairs of the five best manufacturers*

No less than 5 brands outstandingly robust

It's getting tight on the winner's podium: Raleigh, Flyer, Pegasus, Stevens and Cube all get the best score of 1 for low need for repairs.



Repair costs of the five best manufacturers*

Raleigh slightly less expensive

With a gap of only a tenth of a grade, Raleigh takes first place here, closely followed by Flyer and Kalkhoff with 1.7. Winora and Pegasus receive a grade of 1.8 in terms of repair costs.



Good to know:
Further
WERTGARANTIE
studies



If you are interested, you can find our other studies here:

E-Bikes in the spotlight
E-Bike Repair Study 2020

WERTGARANTIE uses a representative survey to examine the most frequent causes of damage in relation to e-bikes. In addition, it evaluates, among other things, which protective measures are taken, what the repair behaviour looks like and which technical problems are most widespread with e-bikes.

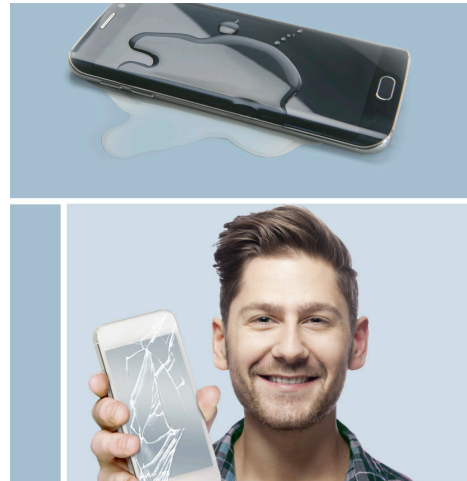
› [Click here for the study.](#)



Smartphones in the spotlight
Smartphone Repair Study 2020

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.](#)



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.](#)



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.](#)



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.

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.

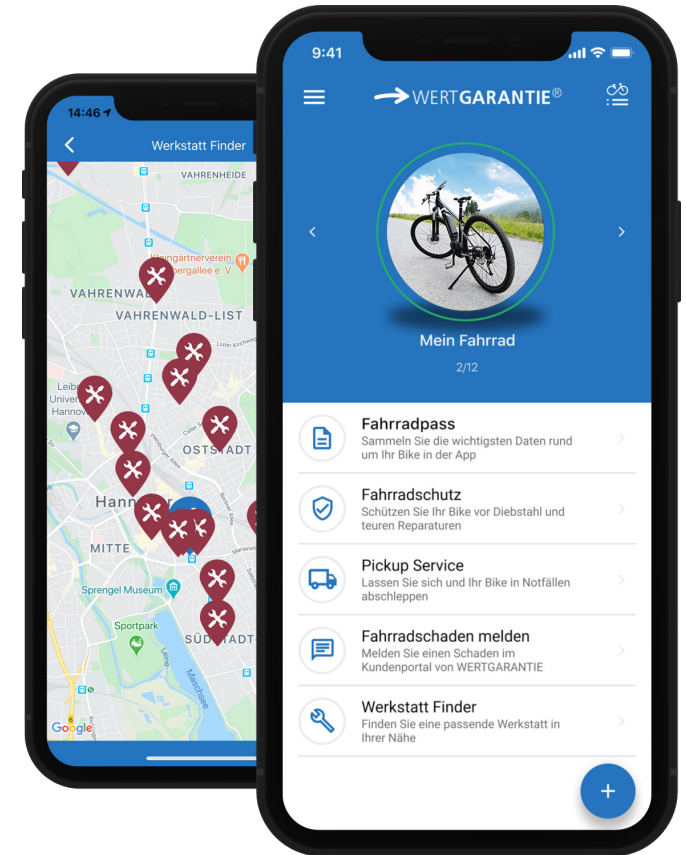
Repair workshop needed?

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!

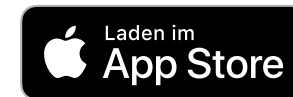
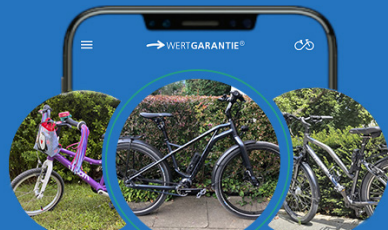
Customers with an insured e-bike/pedelec can call the pick-up service directly via the app. The breakdown service will take them back to a workshop or the starting point of their tour. The following also applies: the owner of the first uninsured bike or e-bike/pedelec, which is being registered manually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

Discover our BikeManager yourself:
www.bike-manager.de



The BikeManager App Our service for all bikes

- Bikedata Cloud
- BikePass
- WorkshopFinder
- Pick-up Service
- Insurance



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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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