

2023

Volvo Car Mobility — A Sustainable Journey

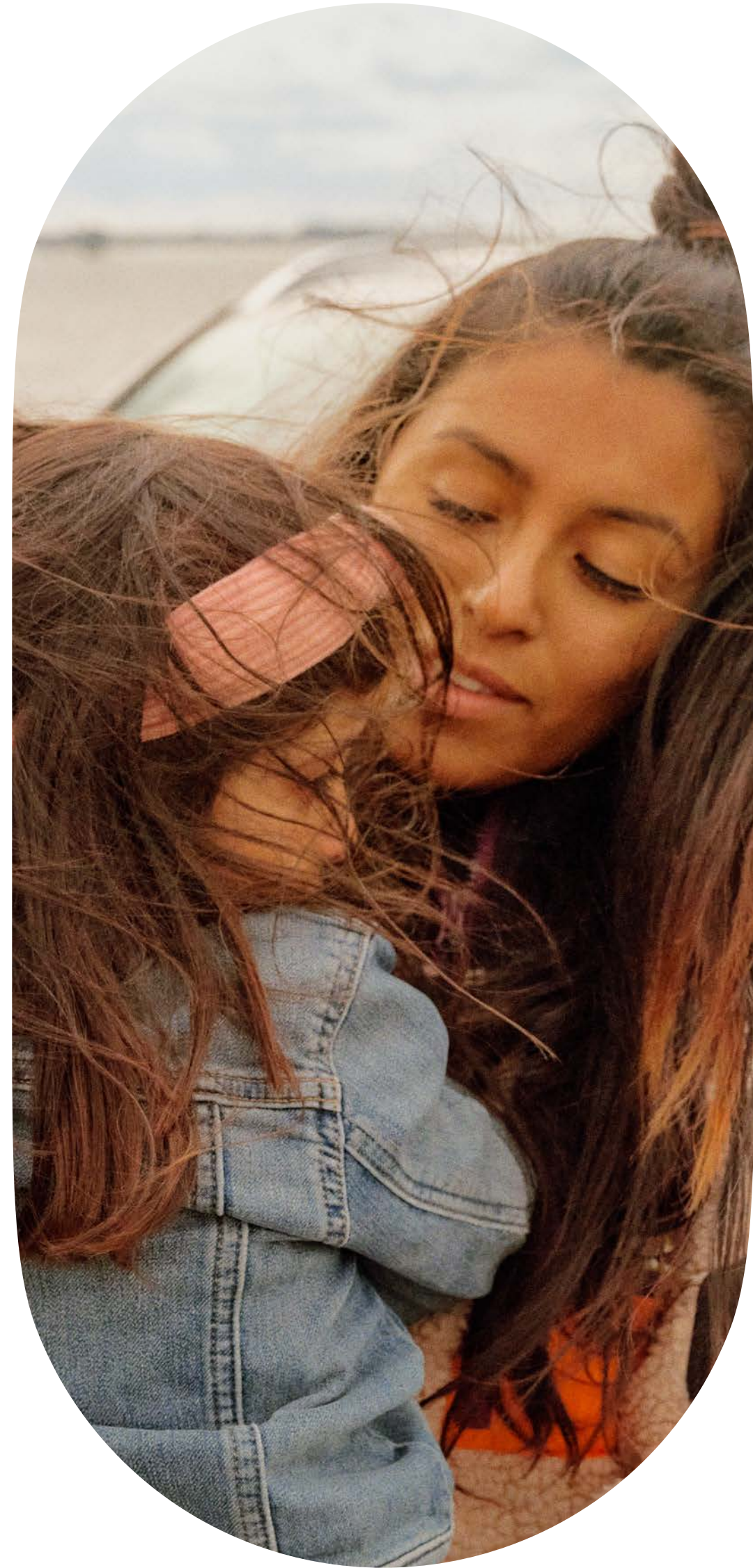
Volvo Car Mobility

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Sustainability In Brief



Introduction



5%

Is the average time a privately owned car is in motion

Cars are made to move.

Despite this, they only spend a fraction of their time in motion. As a result, large parts of vibrant cities have been transformed into parking lots. In some areas, parking now takes up as much, or even more, capacity as our living spaces.

This doesn't make much sense to us.

Car ownership in cities comes with many challenges.

The cost of ownership is high, and once we own a car, we tend to use it even when public transport, biking, or walking would have been more beneficial. And with parking often being expensive and far from easy to find, car owners spend unnecessary time and fuel searching for where to park.

Cars were meant to give us the freedom of mobility, not financial, environmental, and social burdens. It is time to re-think how cars are used in cities.

We are Volvo Car Mobility, a mobility technology company. Through our smart mobility product Volvo On Demand, we give our users flexible access to cars from Volvo and Polestar when and where they need them - from an hour to a weekend, a week, or on a month-by-month basis.

On our journey to provide better and more flexible access to cars, we have clear connections to people and the planet. This report is for anyone who wants to learn more about how Volvo Car Mobility works with sustainability and how our technology positively contributes to the cities we are present in.

About Volvo Car Mobility

Volvo Car Mobility is a subsidiary of Volvo Cars.

We were founded as a strategic investment to develop mobility technology, reach a broader customer base, and meet new consumer preferences. Our main product is Volvo On Demand, which provides access to cars from Volvo and Polestar.

Volvo Car Mobility has around 200 employees, headquartered in Stockholm and with local offices in Gothenburg and Malmö.

Grown from Swedish Innovation

Early commitment to safety and comfort made Volvo Cars a global leader in mobility. As part of the Volvo Car Group, we bring this Swedish legacy of innovation with us.

Our product for flexible car access, Volvo On Demand, is developed in Stockholm, an area defined by early adopters, innovation, and a general curiosity for sustainability. Sweden is our first market where we work to develop our sustainable impact in relation to customer satisfaction.

making

access

smarter

than

owning

Our Sustainability Potential

Our Sustainability Potential

Transportation is a cornerstone of thriving cities — but it must be decoupled from the negative impact it can have on the planet and people.

As a mobility technology company, we are working to solve significant sustainability challenges. Our technology has the potential to:

- 1 Reduce emissions in and from cities;
- 2 Increase the amount of space that is available for people in urban areas
- 3 Develop business models for improved resource efficiency and circularity

These areas tackle some major global and local challenges.



The Problems We Are Working To Solve

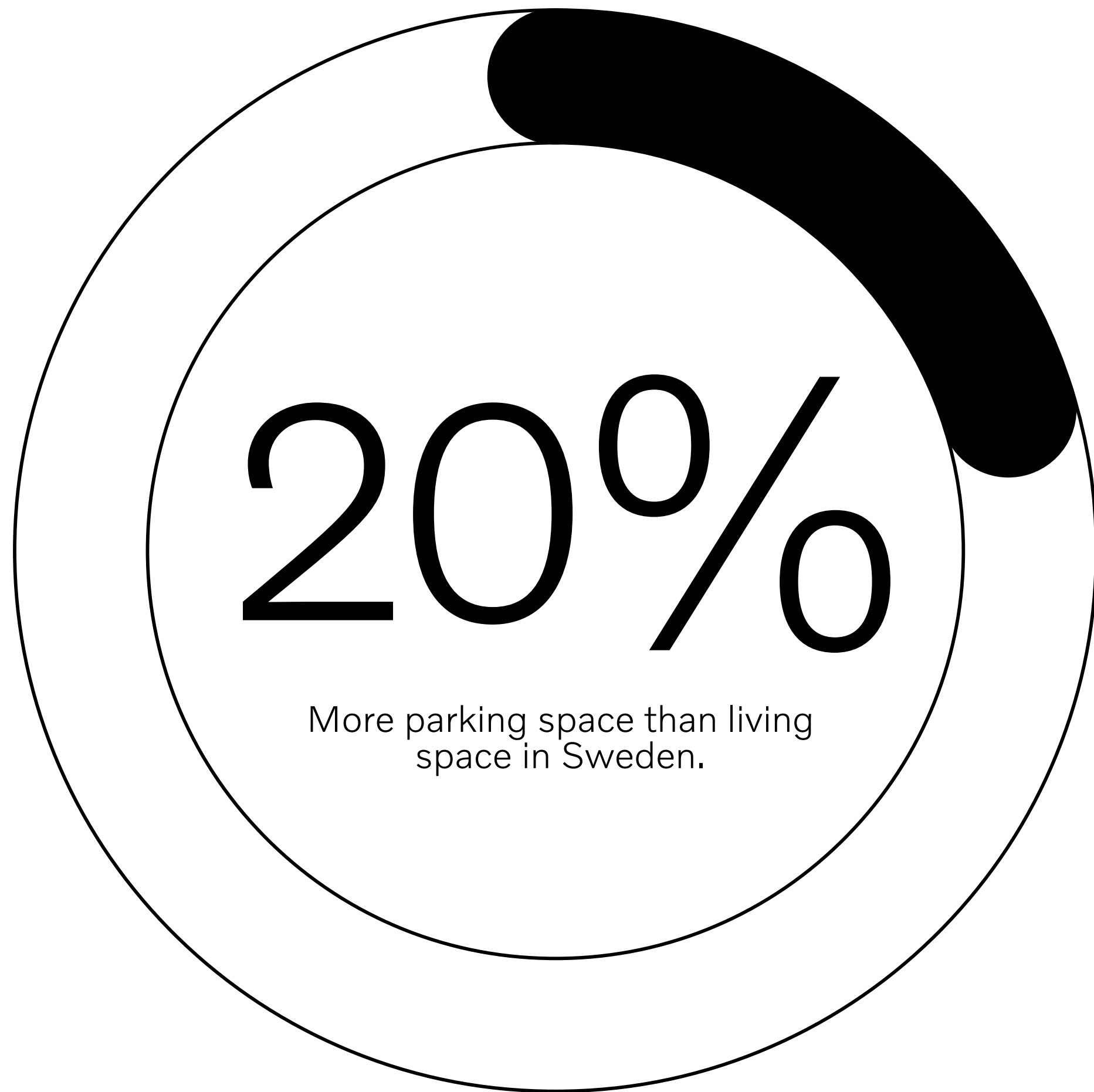


75%

Emissions

Cities are responsible for approximately 75% of global CO₂ emissions, with transportation being one of the largest factors⁽¹⁾. Transportation is also the source of greenhouse gas emissions that is growing the fastest⁽²⁾.

In Stockholm, it produces half of the city's emissions. Of these, half of the emissions come from passenger cars⁽³⁾. Unnecessary driving creates emissions and pollution that can, and should, be avoided.



Space

Around 68% of the global population will live in urban areas by 2050⁽⁴⁾. As cities become denser, space becomes growingly scarce. In Sweden, the average living space per person is 42m², while parking space per person amounts to 50m²⁽⁵⁾. It is time to do something better with the space we have, for example with the 37 000 parking spaces situated on the streets of central Stockholm⁽⁶⁾.



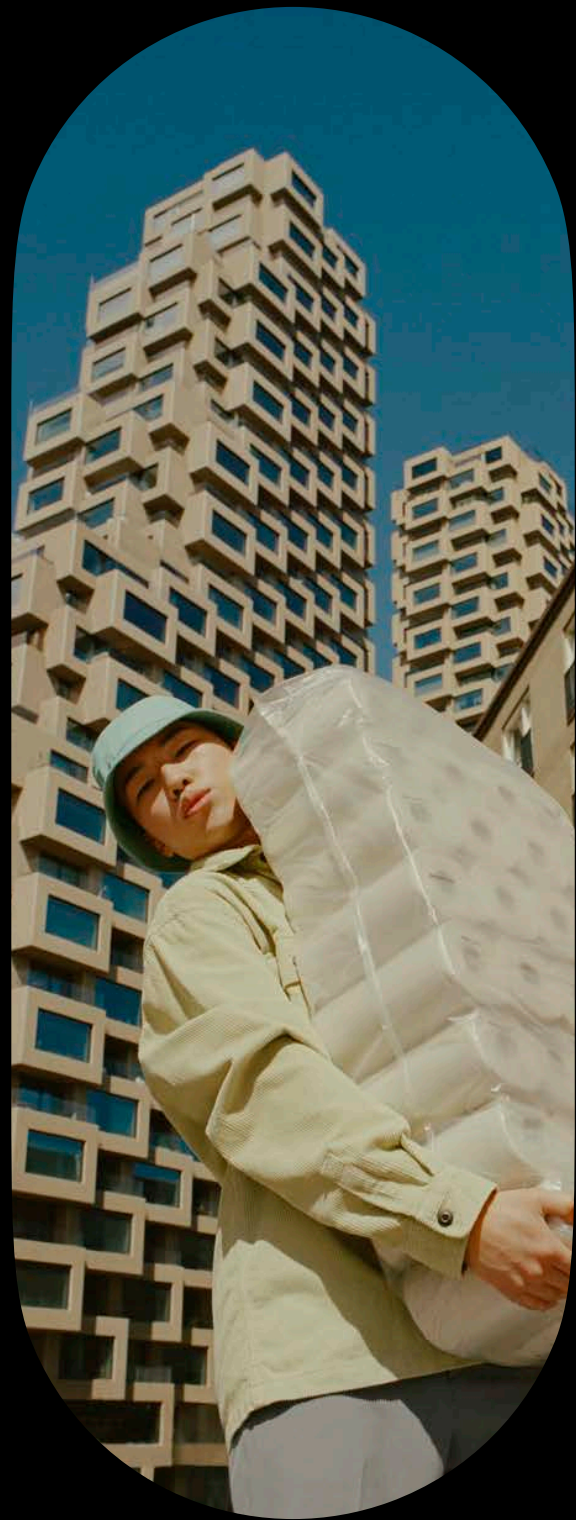
The average time a privately owned car is parked

Circularity

Taking what Earth gives us for granted is easy, but the world's natural resources are limited⁽⁷⁾. Keeping all the resources needed to produce a car in mind, it is alarming that the average privately owned car is parked 95% of the time^[8]. We want to challenge old thinking and further ideas that improve resource efficiency. Circular business models can deliver huge material savings⁽⁹⁾.



Sometimes
I need a car.
Most of the
time I don't.



The Benefits We Create

The benefits We create

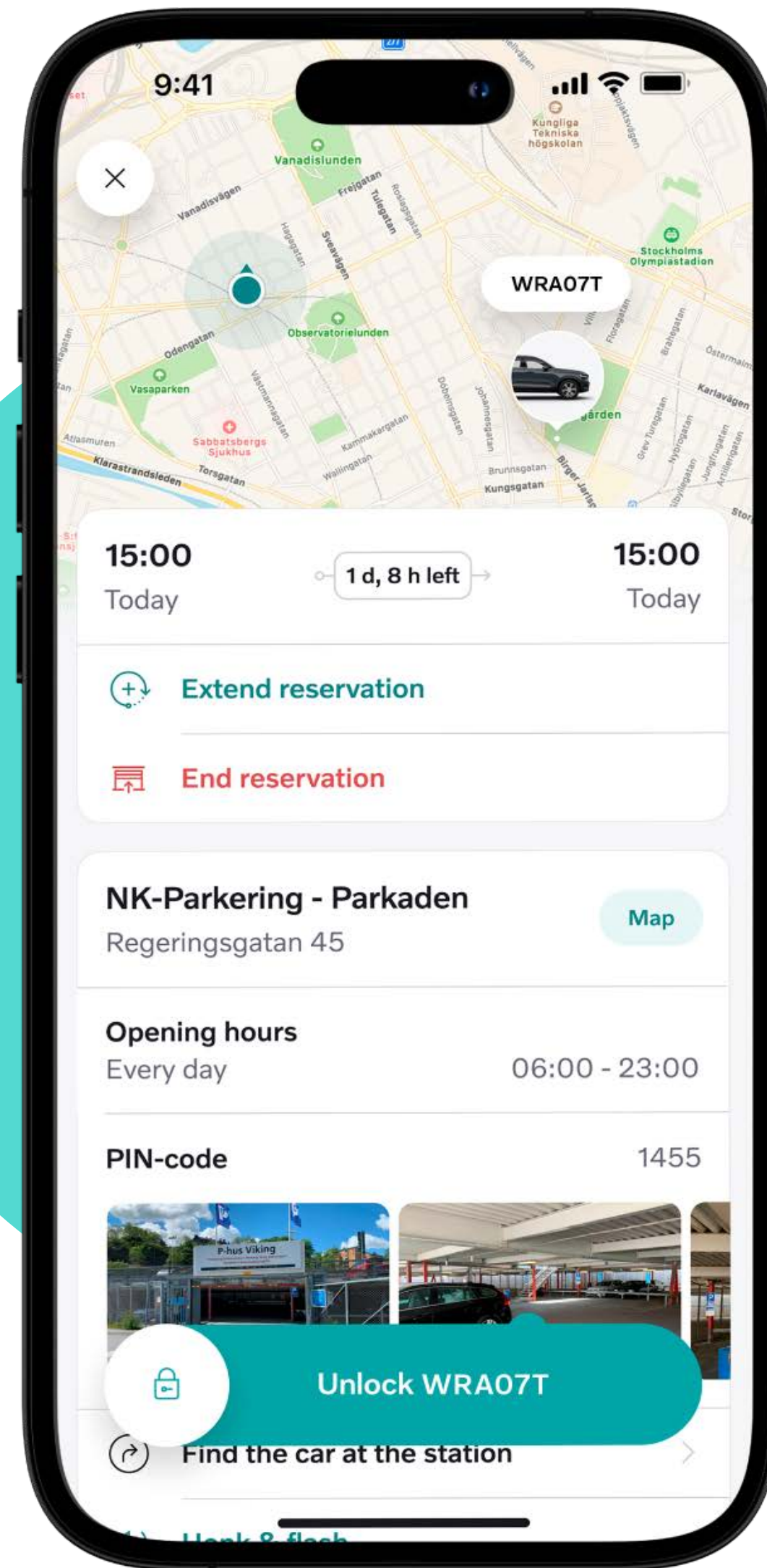
So, what are our solutions?

In a nutshell, we enable more people to benefit from using fewer cars – ensuring that the vehicles needed in society to provide people with the freedom to move are utilized to a greater extent.

We actively work against short trips and unnecessary driving. We are part of a mobility mix that encourages people to drive when it is the best option. Using a car should complement, and not be a substitute for, public transportation, micro-mobility, biking, and walking.

We are part of Volvo Cars' target of becoming a circular business.

Here is what we have achieved so far:



Volvo On Demand provides flexible access to cars from Volvo and Polestar, allowing more people to benefit from using fewer cars.



Measuring our car-sharing product's impact on our customers, **every car shared from Volvo On Demand replaces the need for up to 11 privately owned cars⁽¹⁰⁾**. Based on the size of the Volvo On Demand fleet, this equals a replacement of over 13 000 privately owned cars.

20 300 tons of CO2

By enabling more people to use fewer cars and reducing the number of unnecessary trips, our car-sharing product shows an estimated reduction of about 20 300 tons of CO2 from tailpipe emissions in Sweden in 2022 ⁽¹²⁾.

This is the same as 8 000 roundtrip flights from Sweden to Thailand⁽¹³⁾.

= 8000 Flights

1630000 m²
= 23 Football Fields

By providing car sharing, we reduce the need for parking spaces. Volvo On Demand's contribution to removing cars can be compared to freeing up 163 000m² of urban space ⁽¹⁴⁾.

This is the same as almost 23 full-size football fields. Imagine what we could do with that space in the middle of a city!





43%

Using our car-sharing product impacts our customers' driving habits. We asked our active users about their driving habits after joining Volvo On Demand, and **43% said they drive less after joining Volvo On Demand.**

82% of customers used public transport as much or more, and **30%** walked or cycled more after joining⁽¹⁵⁾.



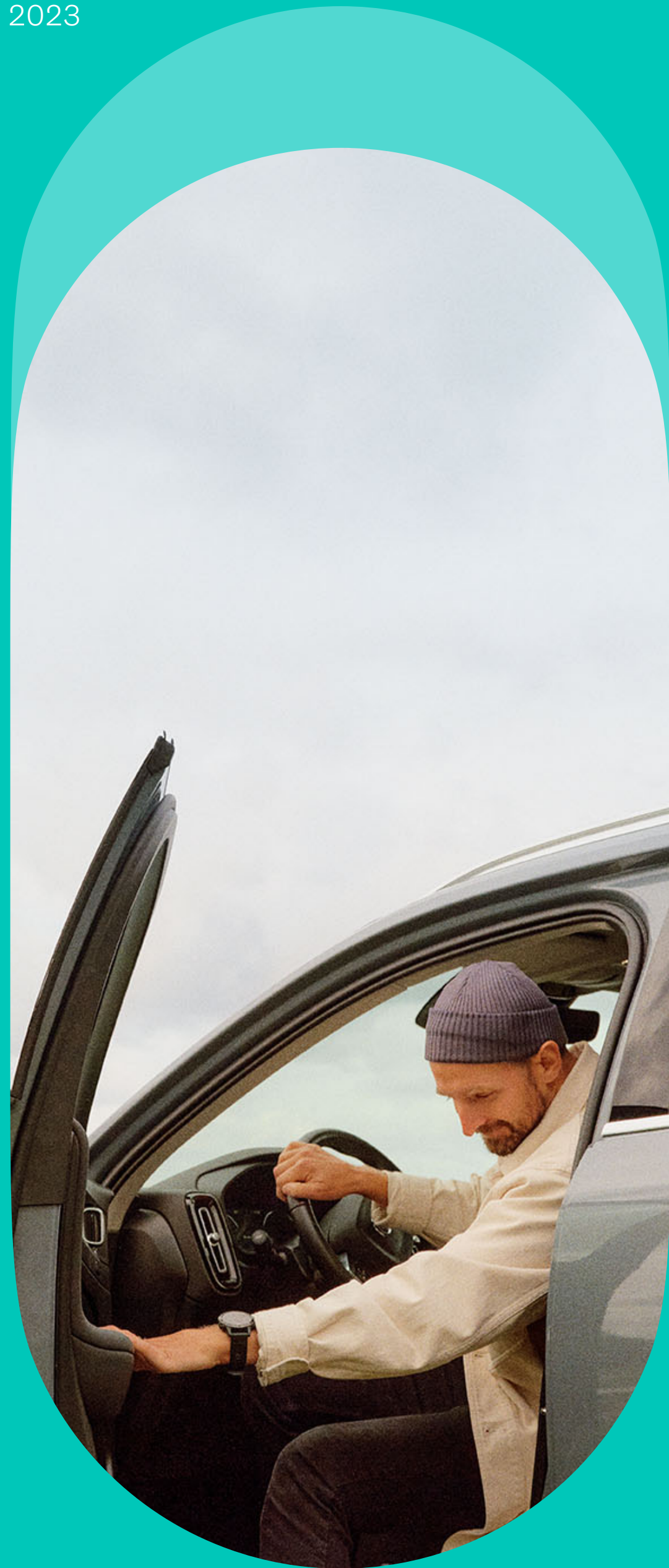
In our surveys, we see that 56% of our active users avoided buying a car thanks to our product, and 20% sold at least one car ⁽¹⁶⁾.



By removing barriers such as purchase prices and car ownership costs, we speed up the transition to electric driving by giving more people access to electric cars by the hour ⁽¹⁷⁾.



Through Volvo On Demand, people who potentially would not afford to buy a new car can get access to some of the most up-to-date and safe cars on the market. On our journey to unlocking a better world, we want to ensure that the cars we need are safe.



Convenience leading sustainability — making sustainable choices easier

Making Sustainable choices easier

To be as successful with our sustainability work as possible, we need to collaborate with our customers and make it practical and easy to travel more sustainably. Here, we have already come a long way. Owning a car in a city is expensive. We believe that for most urban people, it does not make financial or practical sense. We want to give people the freedom to drive when they need to – without getting boxed in by ownership. Having a car is not necessarily the same as owning one.

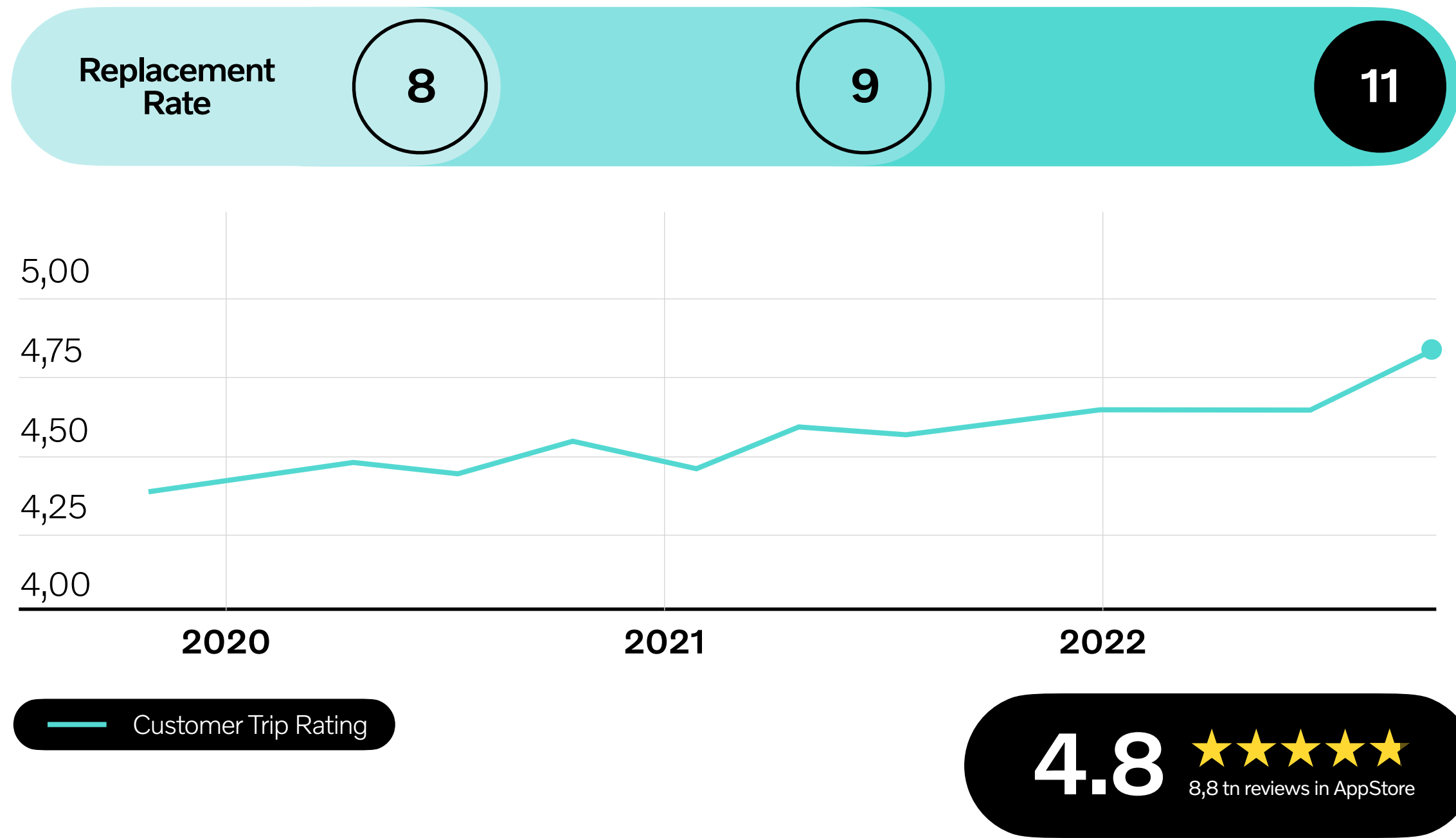
With Volvo On Demand, there is no need to worry about service time and costs. We give access to a car when people need it without caring for it full-time. And our users like it a lot. Since our launch in 2019, we have seen a steady increase in customer satisfaction ratings, increased efficiency of our fleet, and improved sustainability impacts.

Making Sustainable choices easier

Our customer insights show that convenience is the main reason people join Volvo On Demand — sustainability is key to why our customers choose to stay with us.

Our sustainability ambitions are essential to our future success, and we are fortunate to have a business model that can facilitate a positive impact. With Ai-supported technology, we keep improving year by year. Currently, we are further improving flexible access, enabling even more people to enjoy the convenience of fewer cars. Looking ahead, we have great potential to scale our positive impact further.

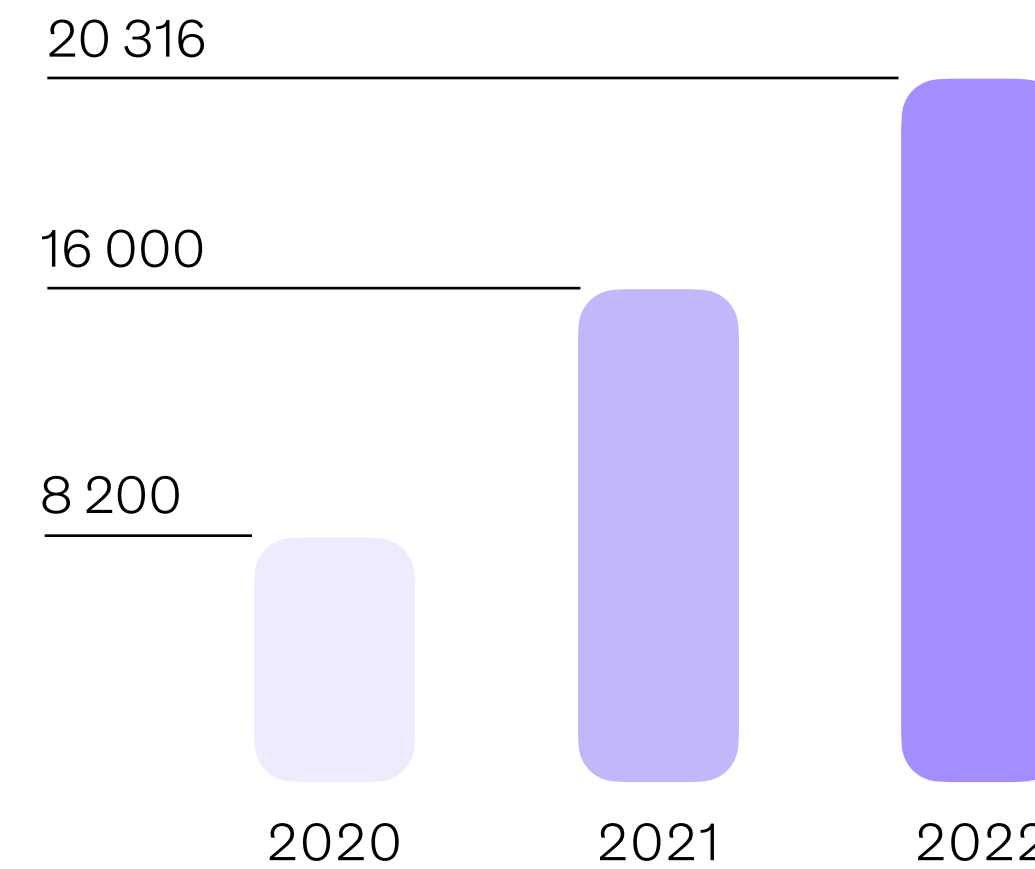
One shared car from Volvo On Demand replaces the need of up to 11 privately owned cars



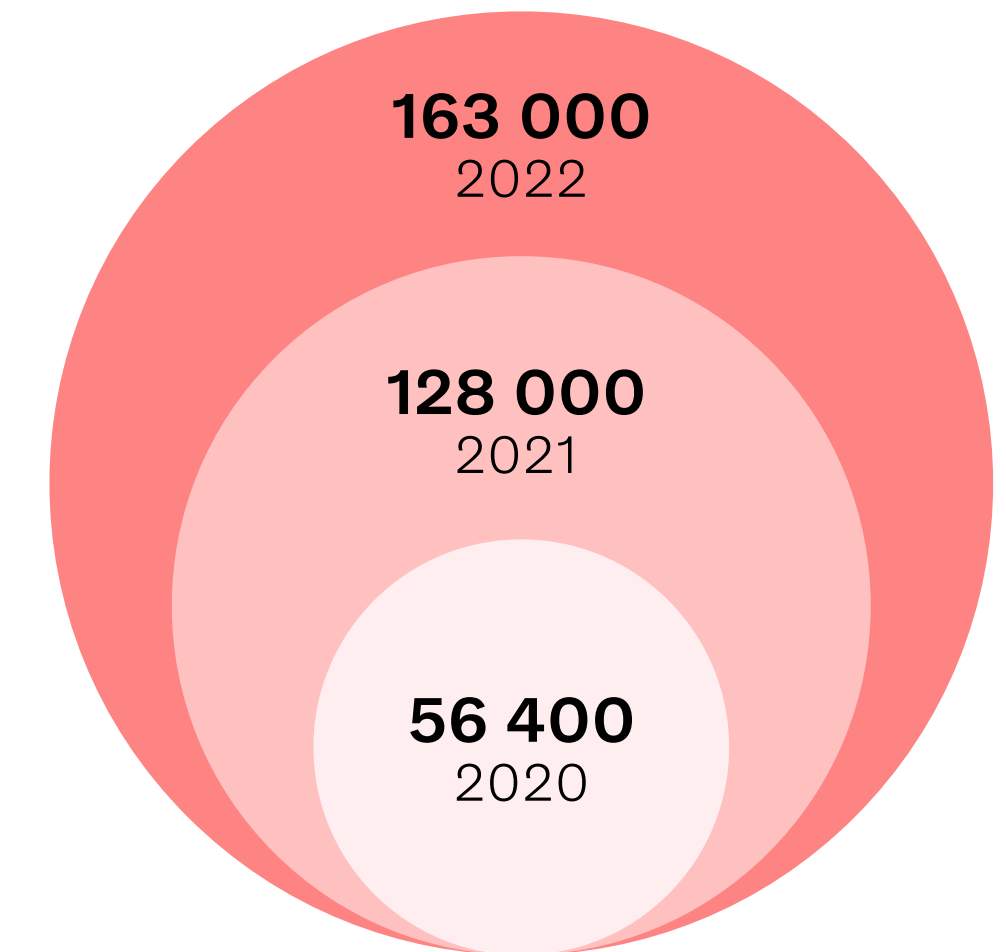
Growing efficiency and customer satisfaction:

Our proprietary mobility platform uses AI-supported technology. The product improves from customer interactions, making it increasingly more efficient as it learns from customer usage. At the end of 2019, we started tracking how many privately owned cars one shared car from Volvo On Demand replaces the need for. At that time, this figure (called replacement rate) was five, and customers gave a trip rating of 4.4 out of 5. Our efficiency has since improved, reaching a replacement rate of 8 in 2020 and 9 in 2021. For 2022, one shared car from Volvo On Demand replaces the need for up to 11 privately owned cars. The trip rating from our customers has improved, the efficiency has increased as well as the sustainable impact

Tons of CO2 avoided



Urban space saved (m²)



Going Forward

We are expanding our product verticals, focusing on increased flexibility and convenience for our customers — making more sustainable choices easier.

The Road Ahead



The Road Ahead

We are proud of our journey so far. Every year, our positive sustainability impact increases with the growth of our company and our offer to the market.

Looking ahead, we are accelerating our mission to unlock a better world, making Volvo cars shareable and giving millions of users access to them. We will continue to increase utilization, free up urban space, and reduce emissions.

All while challenging old thinking and further ideas that will improve resource efficiency and circularity. Imagine removing all the vehicles that are not needed; how would that change our cities? We are ready to find out.

Do you want to learn more about our sustainability work and our service? Or even join our journey as a team member? Get in touch at: volvocars.com/se/on-demand



Sustainability Deep Dive For You Who Want To Know More



For the curious reader

This chapter is for those who want to know more about our sustainability impact. In the following pages, we will describe our work in depth within the three dimensions of sustainability — Environment, Social, and Governance, and how our business and impact connect to the United Nations 17 Global Goals and cities' local sustainability targets.

Global Targets

In 2015, world leaders adopted the United Nations 17 Global Goals.

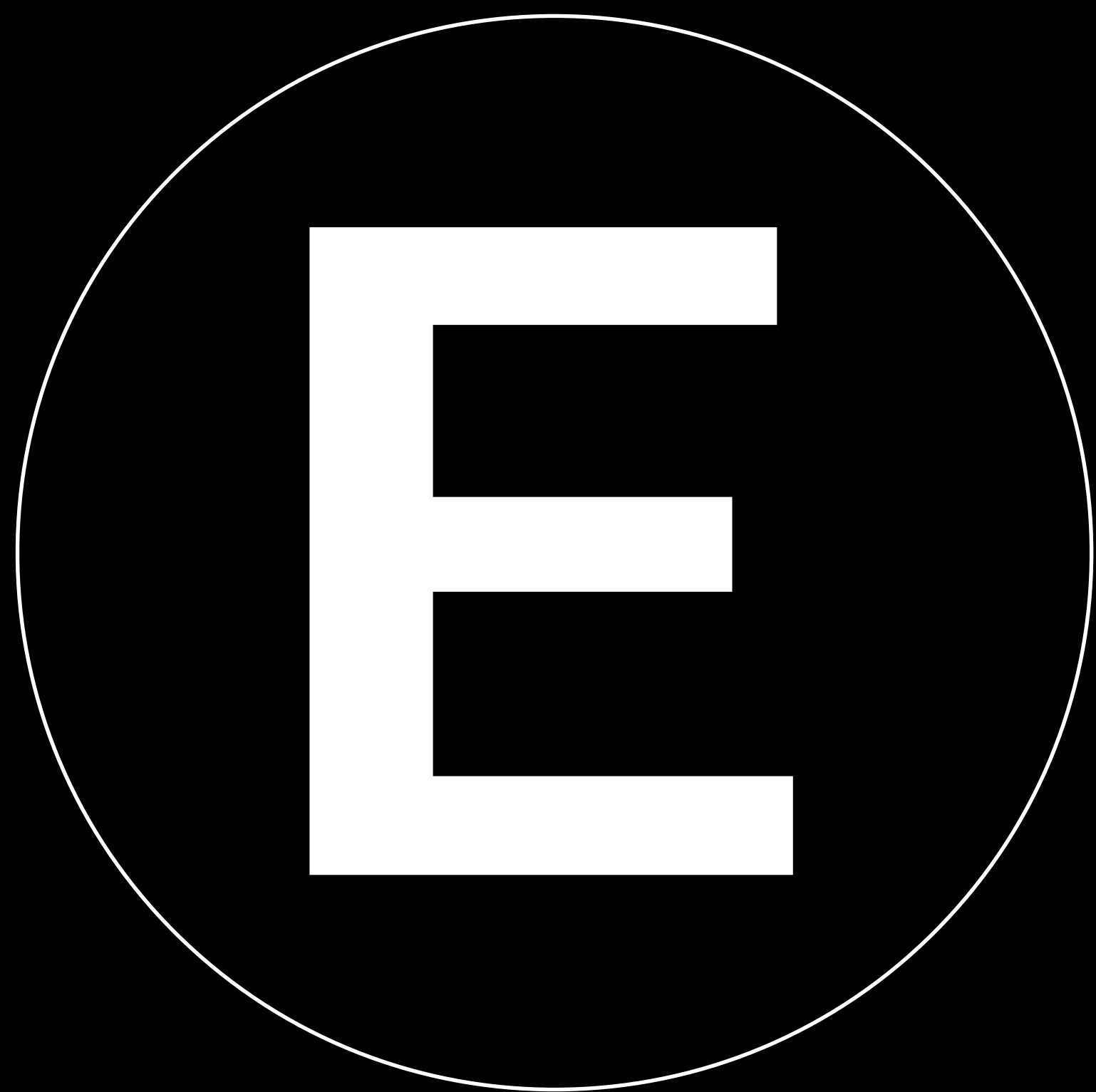
This is a strong framework for tackling the climate crisis, protecting biodiversity, and strengthening social and financial sustainability⁽¹⁸⁾. Together, the goals provide a blueprint of the issues that we as a global community need to solve, as well as the opportunities that this creates — not least for businesses.

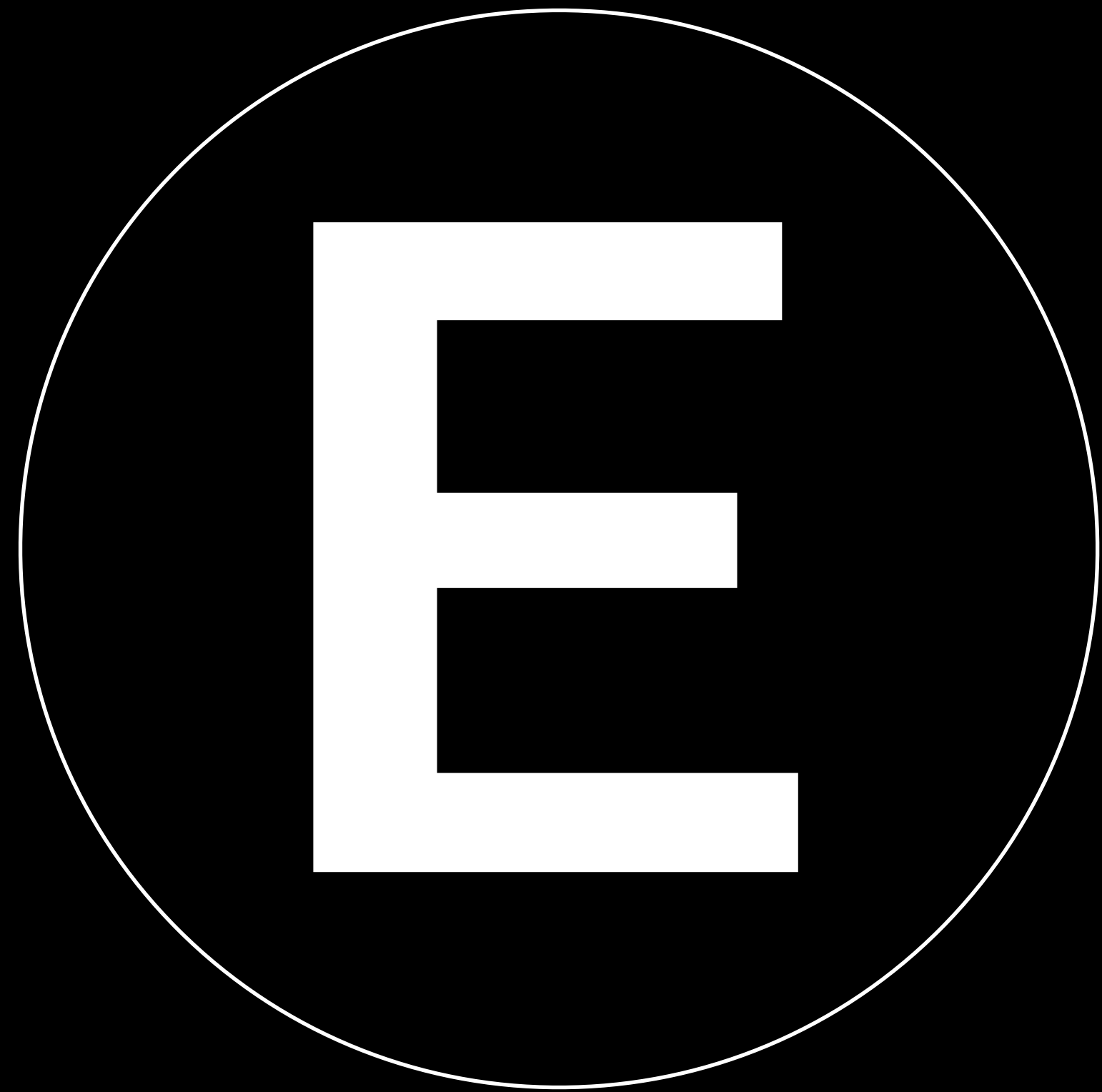
As we at Volvo Car Mobility work to provide flexible access to cars as part of a well-functioning mobility mix, we contribute to the targets of the Global Goals.

Local Targets

With cities and countries striving to limit harm and do good, many are setting their own sustainability targets. One example is that Stockholm strives to become fossil free by 2040⁽¹⁹⁾. The aim is to limit personal emissions to 1,5 tons of CO₂e in 2023⁽²⁰⁾.

The impact of cars and traffic is a big challenge — road traffic is responsible for half the amount of CO₂⁽²¹⁾, so Stockholm aims to reduce traffic by 30% by 2030⁽²²⁾. A mobility mix that includes vehicle access on-demand will contribute to these aims.

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Environment

Emissions and Pollution



The Challenge

Cities are responsible for approximately 75% of global CO2 emissions. Transportation is one of the largest factors⁽²³⁾. Transportation is also the source of greenhouse gas emissions that is growing the fastest⁽²⁴⁾.

In Stockholm, transportation produces half of the city's emissions. Of these, half come from passenger cars. The city calls this “the largest challenge for us to achieve the goal of a fossil-free Stockholm by 2040”⁽²⁵⁾.

In a citizen survey, 80% of people in Stockholm stated that they think it is important that individuals travel in an environmentally conscious way⁽²⁶⁾. Yet, half of the trips made by car in Stockholm are shorter than five kilometers, and every fourth trip is shorter than two kilometers⁽²⁷⁾. And although people pay around 1,100 SEK per month⁽²⁸⁾ for street parking in Stockholm, finding a parking spot in the city is far from easy.



The Challenge

With almost five million passenger cars on Swedish roads⁽²⁹⁾, days are lost in congestion. In Stockholm, people spend 11 work days in traffic every year⁽³⁰⁾. This figure is even higher in other cities, such as Paris, where time lost during rush hour is 18 work days per year. In New York City and London, this figure is around 15 work days⁽³¹⁾.

Cars represent the freedom to move. Yet, we spend much time in cars not doing what we want. Transportation is a main reason for air pollution in cities⁽³²⁾. And air pollution is, in turn, one of the main environmental factors that drive disease in the EU⁽³³⁾.

The time spent in congestion and searching for a parking spot is unquestionably an unnecessary use of time and resources, creating emissions and pollution that can, and should, be avoided.



Our Solutions

Using a car should be a complement to, and not a substitute for, public transportation, micro-mobility, biking, and walking⁽³⁴⁾. By being part of a mobility mix where our users can use the transportation option that is most suitable for their needs, we play an active role in encouraging people to drive when it is the best option.

To ensure that our car-sharing product does not contribute to unnecessary trips, we allow for our cars to be booked for a minimum of one hour. And when our customers are finished driving, the car is parked at its original spot. This way, we ensure our product is not used for short trips within urban areas, where other mobility options are more suitable.



Our Solutions

Using Volvo On Demand impacts our customer's driving habits. We asked our active users about their driving habits, and 43% stated that they drive less after joining Volvo On Demand and 82% of our customers used public transport as much, or even more, and 30% walked or cycled more. ⁽³⁵⁾

Our surveys show that 56% of our active users avoided buying a car thanks to Volvo On Demand, and 20% sold at least one car⁽³⁶⁾. By enabling more people to use fewer cars and continuously enhancing our fleet's efficiency rate, we improve the use of resources and reduce the number of unnecessary trips made by car.



Our Solutions



Our solution for flexible car access is replacing the need for up to 11 privately owned cars, corresponding to avoiding 20 316 tons of CO₂ from tailpipe emissions in Sweden in 2022⁽³⁷⁾. This equals more than 8 000 roundtrip flights from Sweden to Thailand⁽³⁸⁾.

It should also be noted that flexible car access can speed up the transition to electric vehicles. We remove a main barrier in the purchase price and provide access by price per hour — making electric cars available for a larger group of customers⁽³⁹⁾.

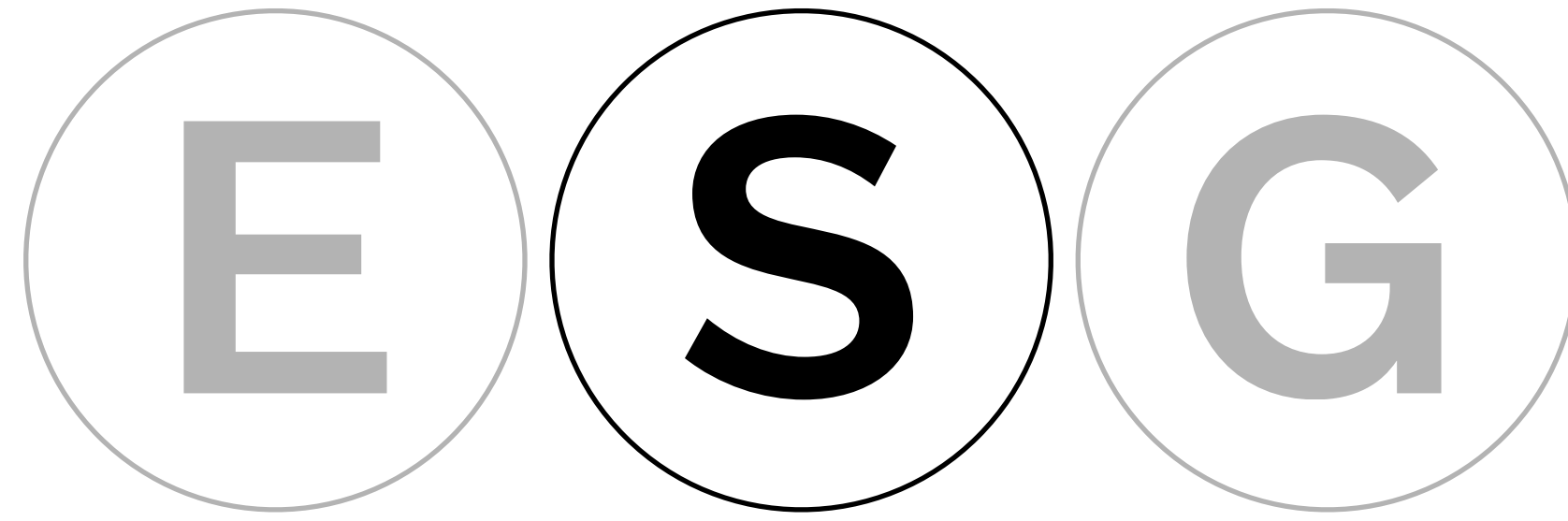


S



Social

People And Space



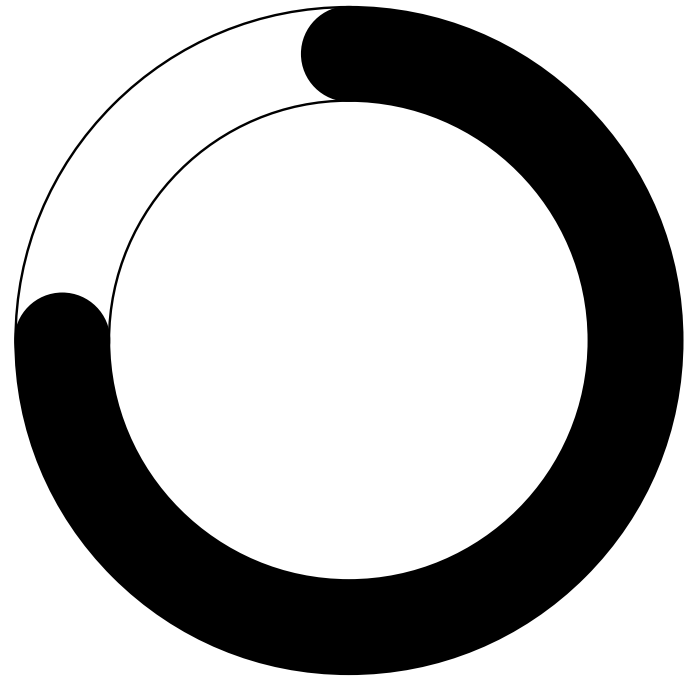
The Challenge

By 2050, it is estimated that 68% of the global population will live in urban areas⁽⁴⁰⁾. As cities become denser, space becomes growingly inaccessible. In Sweden, the average living space per person is 42m², whilst parking space per person amounts to 50m² ⁽⁴¹⁾.

For the city of Stockholm, green areas such as parks and open spaces will likely continue to shrink, as a result of construction on unexploited areas⁽⁴²⁾.

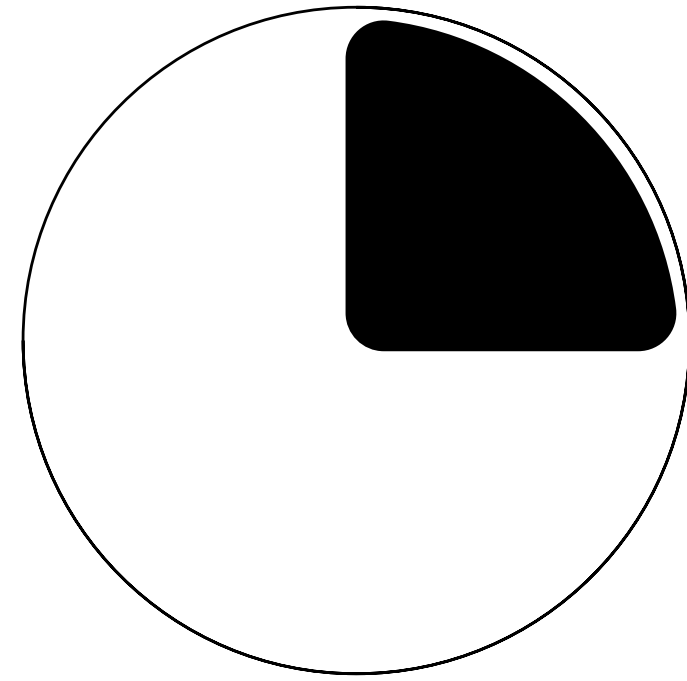
As societies, we need to make better use of the space we have. And here, the street becomes an important part of how our future cities will look, and what qualities they will offer. When people in Stockholm were asked what a street would be like if they got to decide, two of the top qualities listed were car-free areas and greenery⁽⁴³⁾. It is time to do something better with the 37 000 parking spaces situated on the streets of central Stockholm⁽⁴⁴⁾.

75%



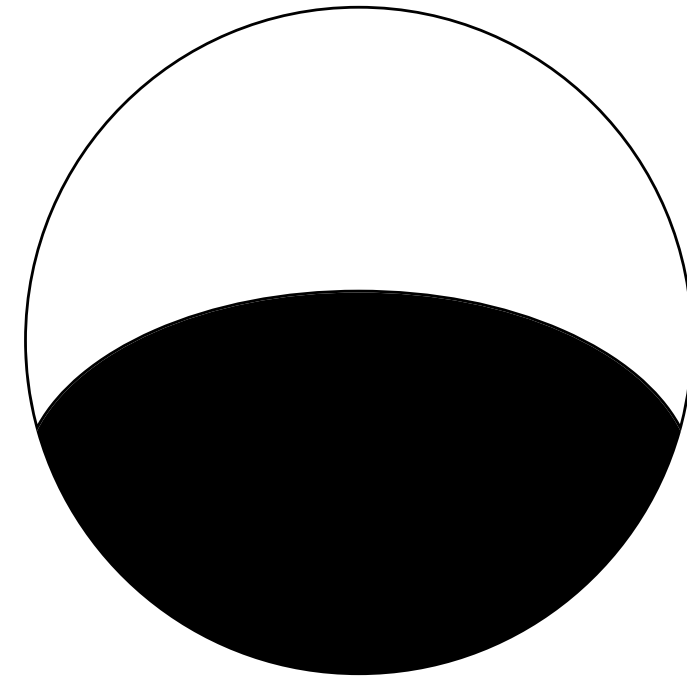
Cities represent 75% of global CO2 emissions

1/4



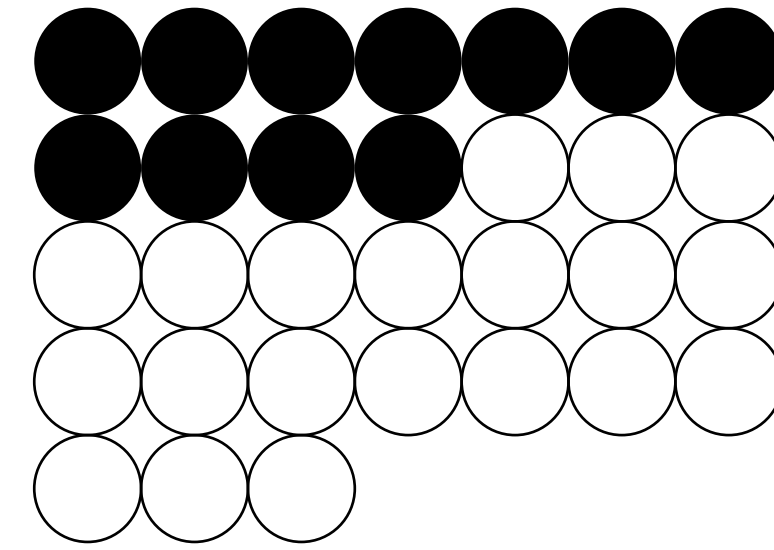
Private cars represent 1/4 of Stockholm's emissions

1/2



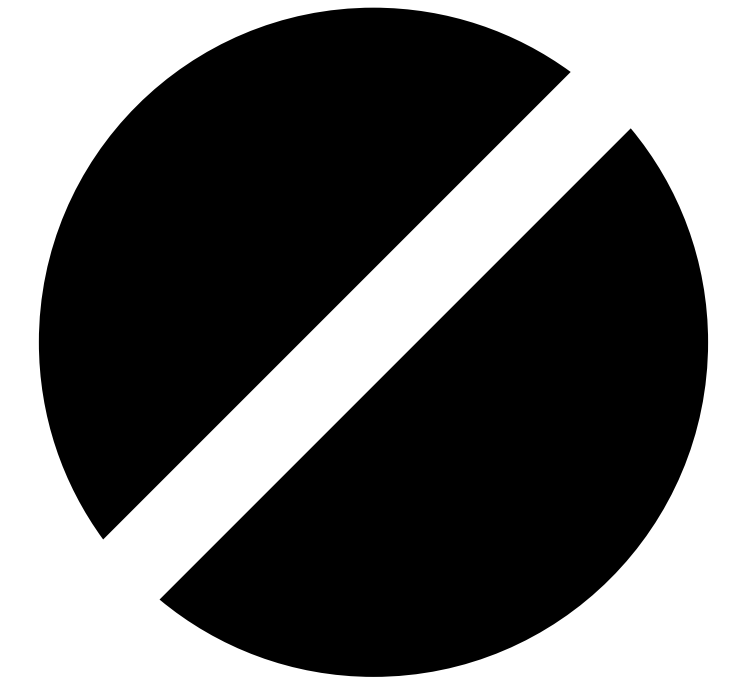
1/2 of the trips made by car in Stockholm are shorter than 5 kilometers

11

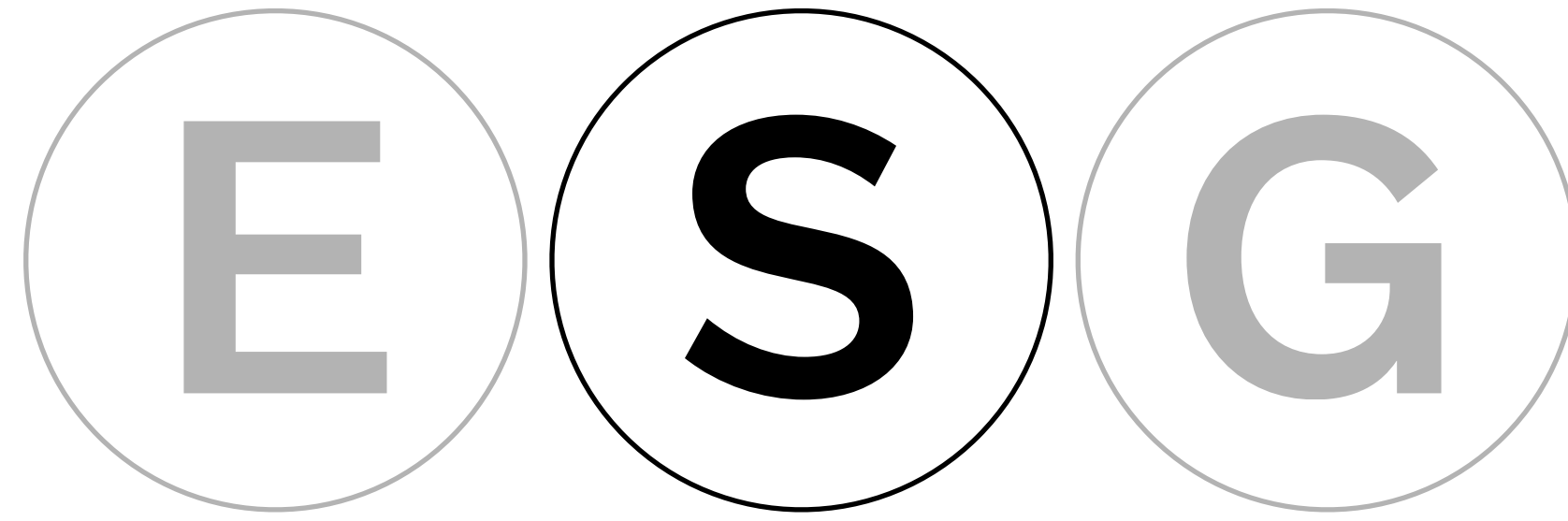


11 work days spent in congestion

1100kr



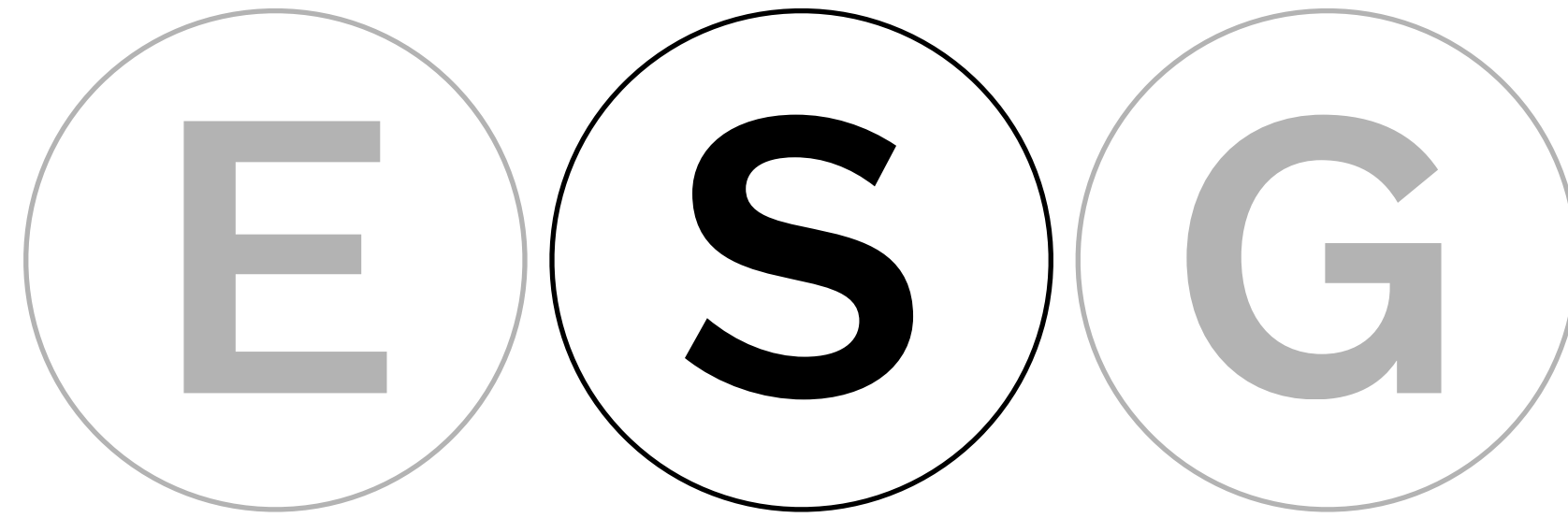
1 100 SEK for parking with no spot guaranteed



Our Solutions

People who live in urban areas do not always need a car — but sometimes they do. By making Volvo cars shareable and providing millions of users access to them, we enable more people to use fewer cars. We thereby contribute to cars being utilized to a greater extent. Every car shared by Volvo On Demand replaces the need for up to 11 privately owned cars.

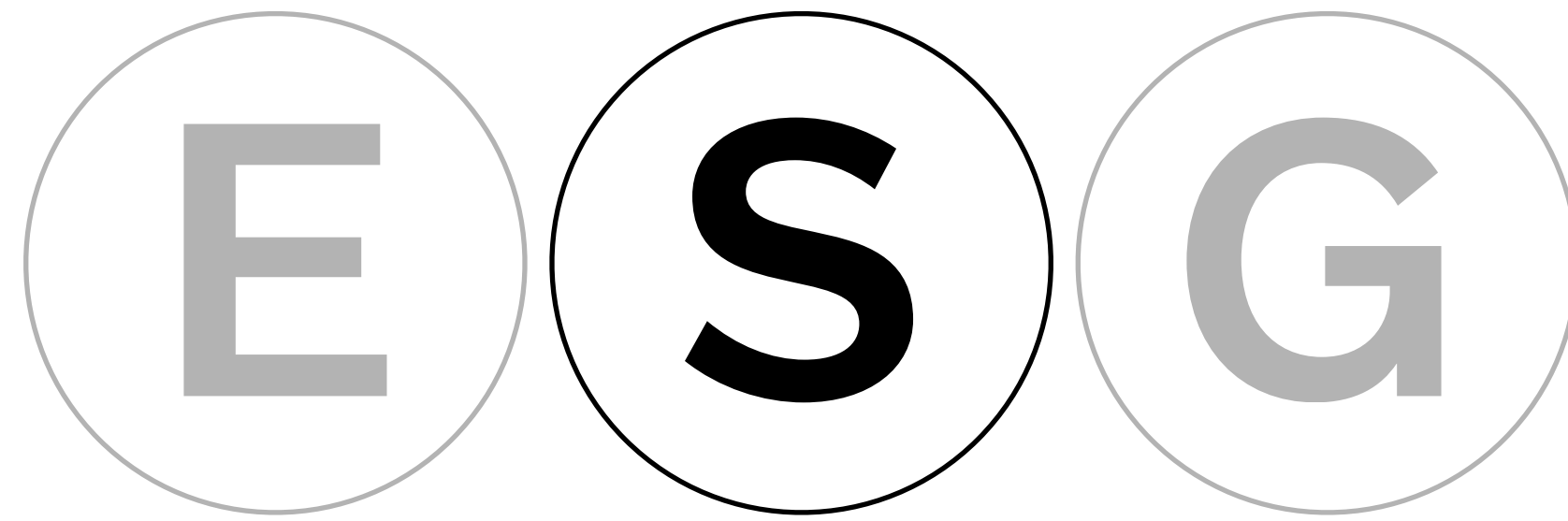
This figure, which we call our replacement rate, has been obtained by measuring the number of customers who sold or avoided buying a car thanks to Volvo On Demand⁽⁴⁵⁾. What if everyone in central Stockholm used our product instead of owning their own vehicles? With our current replacement rate, it would be the same as removing about 327 000 of the 360 000 cars from the streets⁽⁴⁶⁾.



Our Solutions

Using the average size of a parking spot and combining this with our current replacement rate and size of our fleet, Volvo On Demand's contribution to removing cars means freeing up 163 000m² of urban space⁽⁴⁷⁾. This is the same as almost 23 full-size football fields. A world where urban space is reclaimed from underutilized cars is possible.

Regarding social sustainability, one important aspect is allowing more people to travel safely. Through Volvo On Demand, people who potentially would not afford to buy a new car can get access to some of the safest cars on the market.



Our Solutions



Internally, our social focus is on diversity and inclusion. A diverse, inclusive workforce promotes fairness and equity and drives innovation and creativity. By the end of 2022, with almost 200 employees, 53% were men, and 47% were women. The leadership team had 67% men and 33% women. In the R&D leadership, 67% were women, and 33% were men.

We are fortunate to have attracted many nationalities, bringing multiple perspectives. This diversity helps us better understand and address our planet's complex challenges and allows us to develop more inclusive and effective solutions. We recognize that there is always more work to be done. By fostering a culture of diversity and inclusion, we are confident that we will continue to make strides toward our sustainability goals and unlock a better world for everyone.



Governance

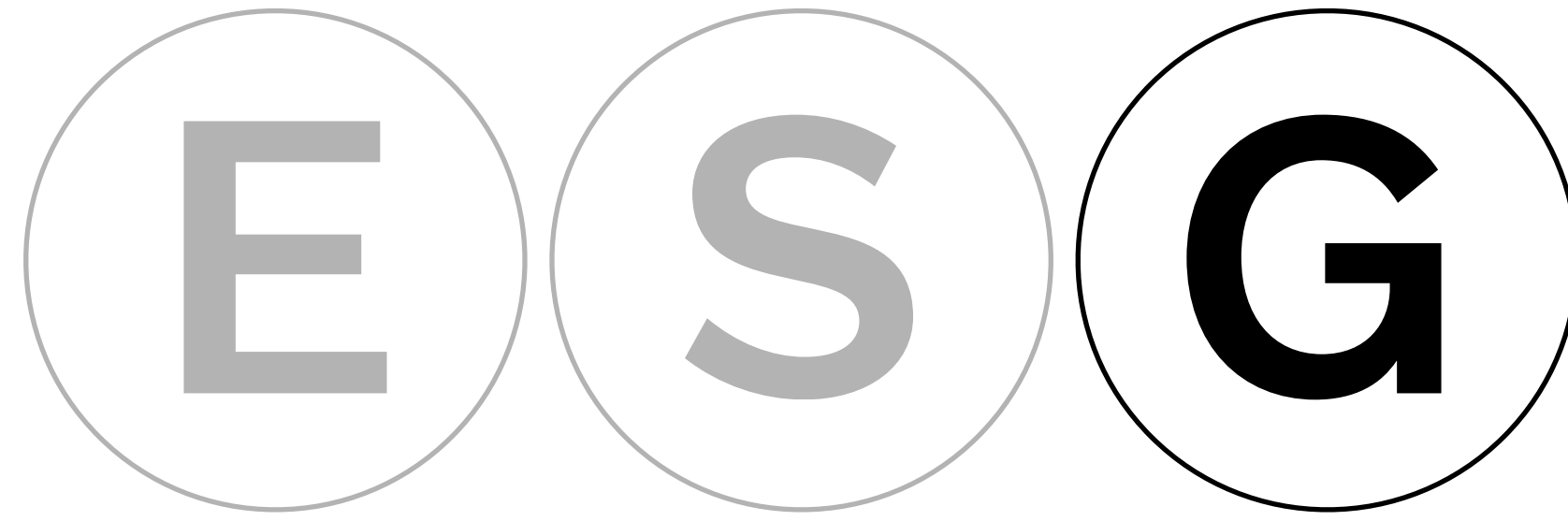
Business and Circularity



The Challenge

Sometimes it is easy to take what Earth gives us for granted. With the resources needed to produce a car in mind, it is alarming that the average privately owned car stands still 95% of the time⁽⁴⁹⁾. The demand for transport is growing worldwide, and if new ways of enhancing mobility access are not implemented, emissions from the transport system could grow by 60% by 2050⁽⁵⁰⁾.

There is clearly a need to challenge old ways of thinking and to further ideas and usage models that improve resource efficiency and circularity. Circular business models can deliver huge material savings⁽⁵¹⁾.



Our Solutions

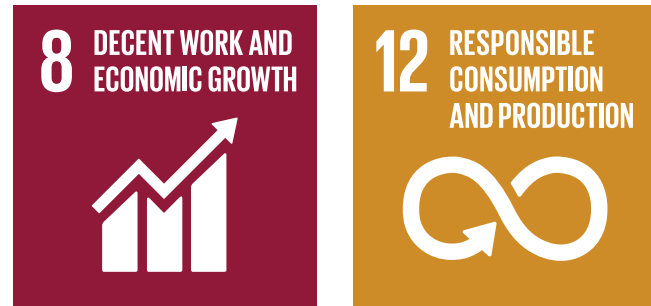
The stages of life are different, and so is the need for using a car. As a young person living in a city, you might need a car sometimes — but far from always. But as a parent in the suburbs, a car is often more necessary to make daily life possible.

This is why we, as a part of Volvo Cars, provide solutions for the stages of life. It is also a way for us to explore more circular business models and improve resource efficiency.

Volvo Car Mobility is a part of Volvo Cars' target of becoming a circular business⁽⁵²⁾. Circularity aims to break the linear thinking of extracting raw materials, producing a product, using the item, and finally disposing of it as waste.



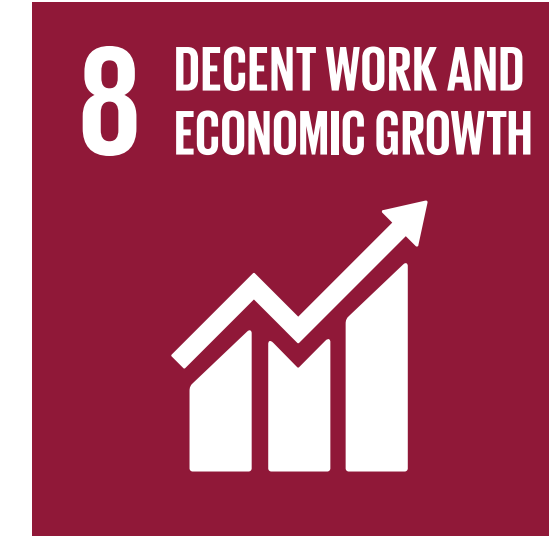
Our Solutions



By designing in new ways, waste can be eliminated, components reused, and the amount of recycled material increased. Here, Volvo Cars has already made important achievements. For example, 96% of the global waste from production is recycled, and by renovating parts instead of producing new ones, Volvo Cars uses 85% less raw materials and 80% less energy⁽⁵³⁾.

At Volvo Car Mobility, we contribute to the circularity goal by providing technology and solutions for a better usage cycle and making better use of cars. Every car shared with Volvo On Demand replaces the need for up to 11 privately owned cars⁽⁵⁴⁾. In addition to the circular ambitions, Volvo Cars aims to become climate-neutral by 2040 latest. In practice, this means that Volvo Cars will limit their negative impact on the climate, which will be achieved by reducing the life cycle impact of each car⁽⁵⁵⁾.

The Global Goals We Work With



Appendix

Methodology

We survey active private customers, defined as customers who have used Volvo On Demand at least 6 times in the last year. Respondents are asked about car ownership and driving habits before and after using Volvo On Demand.

In 2021 we ran a survey on driving habits and car ownership sent to private users. In 2022, we surveyed private users by asking questions in our app. The questionnaire in the app was live in September 2022. To get the total survey target, we calculated how many users would have received/responded to the questions if the questionnaire had been live for a full year.

Methodology to calculate the replacement rate of privately owned cars per shared car from Volvo On Demand

Respondents were asked whether they sold a car due to their Volvo On Demand membership and if the service influenced their decision not to own more or any cars. Respondents could also indicate if they had sold a car or changed their intentions to buy one for reasons other than their Volvo On Demand membership. For 2022, 488 privately owned cars were sold, and 213 avoided purchases due to Volvo On Demand memberships. These numbers were then divided by a total of 2 633 responses. This gave the average number of privately owned cars removed from the street per respondent (0.78). We applied this factor to the survey base of 11 653 active private customers. This scaled factor was then divided by the size of the shared Volvo On Demand car-sharing fleet (1 214) to obtain the number of privately owned cars replaced by each Volvo On Demand car. Since the survey only includes private use of the service, the vehicle fleet was adjusted based on the share of booking time made by Volvo On Demand's active private customers (0.634).

The suppression effect was included in our calculations since car-sharing services also reduce the number of privately owned cars bought in the future. When quantifying the suppression effect, the assumption was that each customer who said they avoided buying a car due to their Volvo On Demand membership suppressed one car. We have excluded users who reported selling a car when looking at those who avoided buying one. This reduces the potential risk of double counting among respondents.

Calculating reduced CO2 tailpipe emissions and freed up space in cities

To calculate a reduction of CO2 tailpipe emissions, the replacement rate was multiplied by the average fleet size, then by the average CO2 emissions of a private car, ~1 584 kg. This average was calculated using the average CO2 emissions that the previous sustainability report used, and weighting it by the ratio of our fleet in each city. To get to the final reduction of CO2 emissions, the total emissions from our fleet during the year were subtracted.

Freed-up urban space was calculated by multiplying the replacement rate by the average fleet size in the service during the year to get the total number of cars replaced and then subtracting the average fleet size to get the total number of cars removed. This number was then multiplied by the size of an average parking spot of 12.5 sqm.

Limitations of the study

The impacts of Volvo Car Mobility on respondents are self-reported. However, this limitation is unavoidable since the respondent is the most knowledgeable about whether their membership decreased their car ownership.

Since we only survey our active private customers, we only include a share of our fleet proportional to their share of booked journey time when calculating the replacement rate. The CO2 emissions reduction and saved area are calculated by applying the replacement rate across our fleet.

When calculating the reduction in CO2 emissions from tailpipes, we assume the cars we replace would have generated emissions in line with the average private car. That average is calculated by scaling the values of CO2 emissions per city in 2021's sustainability report, which were based on data from Transportstyrelsen, proportionally to the share of the VOD fleet in each city respectively.

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