AUTONOMOUS DRIVING FUTURES

VOLVO

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Overview

The Autonomous Driving (AD) Futures cards are designed to bring to you new insights and design implications regarding how we will live with AD cars as they become increasingly autonomous and ubiquitous in our everyday lives. The cards have been made to inspire human-centric design, keeping people's experiences and expectation at the centre of the development and design of AD cars, services, infrastructure and planning.

This pack of cards can be used to explore new approaches to the way we think about the future of autonomous driving. Use the deck to gain a new perspective, inspire a team or to try a new approach.

The cards are based on the findings of in depth ethnographic research into Human Expectations and Experiences of Autonomous Driving. All 60 cards are aligned to one of the 10 core themes of the research. Each theme builds a set of thought provoking examples, research findings, insights, implications, questions and future scenarios.

How to use these cards

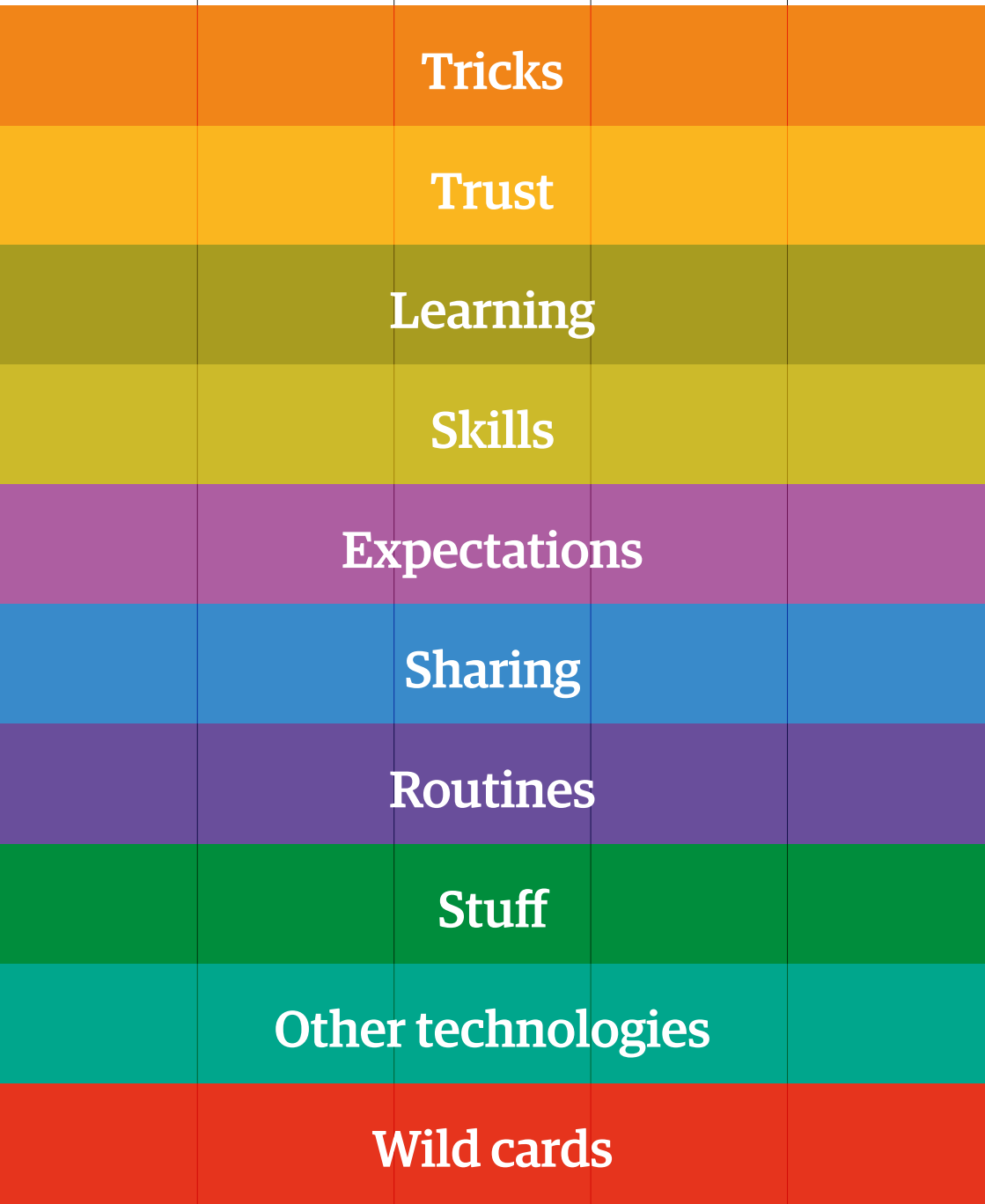
Based on categories that emerged from our research, the cards are divided into 10 themes: tricks, trust, learning, skills, expectation, sharing, routines, stuff, other technologies and wild cards. Each theme includes six more cards: two cards present direct quotes from the research, and one card each presents insights, implications, questions and futures. Cards with the quotes and insights introduce AD futures through the eyes of ordinary people participating in our research. The implications, questions and futures cards present a problem statement and a scenario.

These cards help you generate creative ideas by building empathy and encountering the nuances of people's experiences of and hopes for AD futures.

There are several ways to use the cards:

- Create a simple way to show and tell stories of a set of findings and the insights and implications derived from them.
- Spark up conversations or debates based on their content in research interviews.
- In a structured design workshop using the cards to generate group workshop activities.
- Use them on research workshops by including blank cards in the pack so participants can add insights you might not have thought of yourself.
- Teach students across design and social science disciplines.

Quotes including a person's profile	**Insights** with an empirical example	**Implications** statements with a scenario	**Questions** based on a problem scenario	**Futures** statements with a scenario



Permission to use the cards

The insights presented in this deck of cards are derived from research undertaken within two projects funded by Vinnova - Sweden's Innovation Agency: Human Expectations and Experiences of Autonomous Driving (HEAD); and Trust in Intelligent Cars (TIC). Both projects are collaborations between the User Experience Department at Volvo Cars and a design ethnography research team at the School of Information Technology at Halmstad University in Sweden.

The insights were produced through ethnographic studies in 2016-2018. Research was undertaken, with people across multiple sites: in their homes; while driving their cars; relating to their experiences of experiments designed to test automated car features; and included participants in Drive Me, a field operational test conducted by Volvo Cars in Gothenburg in 2018-2019, where families were given access to specially equipped cars to test in their everyday lives.

The research findings that the insights are based on have been published in a range of scientific journals and conference proceedings, for a full list publication list please contact Vaike Fors (vaike.fors@hh.se).

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Permission to use the cards

Please feel free to use the cards in meetings or workshops in your organisations. If you refer to the cards, please add our team and/or projects as a reference. Researchers involved in producing the Autonomous Driving Futures Cards:

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Tricks

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Quote

Anna: "In the winter I have ... [laughing] ... a blanket plus a wheat pillow ... which I heat in the microwave oven. Because I have a heated seat in my car, but Linn's child seat isn't heated. In the winter the routine is that I go out 5 minutes earlier and load the car, at the same time I take the warm wheat pillow with me and put it in her child seat to warm it up a bit. And when Linn comes [to get in the car] she puts it in her lap."
Researcher: "That's smart. I never heard of that."
Anna: "Yes, but it's another thing to do..." [laughing]

PROFILE

Anna is a single mother with a school aged daughter who she lives with in a house in a small village. Anna works as a police officer, and it is important for her to be independent and be able to take care of things by herself – such as being able to change a flat tyre. It is also important for her to feel in control and relaxed, so she takes things with her so she can be prepared for the unexpected.

Tricks

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Insight

People develop their own, unique ways of driving to make the car fit into their lives.

EXAMPLE

Miguel: "On the way home Alma needs to do all her homework before we get home. She has to do her reading out loud twice and then mathematics. We normally don't finish until we get to… and after that we are discussing what food we want to cook. Many times I have taken a longer route just so she can finish her homework. It's really important that all her homework is done."

Tricks

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Implication

You never know how people will adapt technology into their everyday lives.

SCENARIO

How will people improvise with AD cars to make them fit into their lives and help them to achieve the things they need to accomplish?

Tricks

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Question

We need to be able to design technologies that can account for small idiosyncratic human peculiarities and let people still feel that they can be themselves with their cars.

How could we take into account the unexpected? and how would AD cars need to be designed so that they can cope with things that have not been planned for?

Tricks

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Future

A Tesla Owner: "I am looking forward to the day when I can send my car to do things. I could go to work with the car and then I could send it home to drive my son to his training and then come and pick me up at work afterwards."

SCENARIO

What will it be like to live in a future where you could send the kids to visit their friends and to activities in AD cars?

Trust

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Quote

Bengt: “I guess it’s the same as a taxi driver really. Just the feeling that whoever’s in charge knows what he or she is doing. If you have a driver and it’s the first time they’re driving, you’d sense that. It’s bumpy and not smooth. And I guess it’s the same for AD. Once it feels like it’s able to take decisions and handle situations, well that’s trust for me.”

PROFILES

Bengt is a young father who lives with his wife and two children, just outside Gothenburg. He works in a professional environment and commutes to work by car every day.

Trust

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Quote

Torbjörn: “Trust in AD is ‘knowing what happens next.’”

PROFILES

Torbjörn is an engineer working for Volvo Cars and is in his early 50s. He commutes to work by car every day.

Trust

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Insight

Trust is contextual, and shapes the AD experience in multiple ways. Trust in AD develops differently on the motorway and in city traffic.

EXAMPLE

Joachim: "The main challenge [for AD] is a street like Vasagatan, by which I mean… you can't follow all the rules at the same time. It's clearly impossible. There are trams, pedestrians, cyclists and roads going in four or five different directions. So that's a real challenge for AD. But I think it's doing a good job on the highway already."

Trust

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Implication

Trust is a way of actively knowing; it's tacit, unspoken and it is connected to transparency, communication, familiarity, confidence and sensation.

SCENARIO

Will we fully trust AD cars or not trust them at all? What would make people feel they can trust an AD car?

Trust

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Question

We need to build trust in brands and develop clear legal frameworks for public acceptance in AD.

What decision making should AD cars communicate to build trust? At what point will AD cars become calm technologies? When will they move from the periphery of our attention to the centre and into the background?

Trust

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Future

An engineer: "AD cars can only make our lives easier. They will never make our life more difficult". Can AD cars only make our lives easier? Will they never make our life more difficult?

SCENARIO

A future where we trust computers more than we trust the way people use computers.

Learning

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Quote

Sasko: “Perhaps it [the self-driving car] should not learn everything from me” ... “Brummm ... perhaps I would drive [fast] like that” but “being driven” like that is very different. “That’s the feeling with a self-driving car. They are driving you.”

PROFILE

Sasko is a father and husband of a family with two school age children. They live in a house in the slightly older residential area of Gothenburg. He works in a professional position in the IT business and commutes to work and takes the children to school and activities by car. He is interested in cars and technology and often uses the car for longer trips during vacation.

Learning

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Quote

Maria: "The car wasn't behaving how I would like it to, because I drive in the middle of the lane and the car was more on the right side of the lane. If the car could pick up some things and recognise those... I'd feel safer if the car did something I would normally do."

PROFILE

Maria is a professional and a mother in her late 40s. She was born and raised in Gothenburg, but lives outside the city and even though she works from home a few times a week she needs a car to commute because public transport is not very frequent.

Learning

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Insight

AD futures may involve two-way learning: people learning how to understand and trust the AD car; and the car learning how to drive in the 'style' that people feel most comfortable with.

EXAMPLE

Astrid: "I would like the car to drive a bit more like me. If the car would read my way of driving and acted the same as I do… now the car was indicating and I didn't know which way we were going. We were in the middle lane and it was indicating and there were cars on both sides and I was thinking, where is the car going? I just had to accept it. I would like to see some sort of indication that now I'm planning to go that way."

Learning

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Implication

People 'feel cars'. They learn about them in mostly unspoken, sensory ways that they feel in their bodies as they drive, but that it is hard to even explain to others.

SCENARIO

What will people need to learn to 'feel' when they are responsible for AD cars? How can they learn this? How much should they know about the decisions the car is taking?

Learning

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Question

People will still learn to be in AD cars but how will they get to know the car without touch and feel?

What will it feel like to be in full AD mode?

Learning

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Future

The passengers and the AD-car need to cooperate with each other in order to achieve a 'smooth ride'. "In the future, you will get to know your car and your car will learn to know you".

SCENARIO

A future where you start a car and the car already knows the way you drive on highways and cities, your preferences for lane changing and distance from other vehicles and your preferred routes and destinations.

Skills

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Quote

Anna: "I'm skilled from the persepective of driving carefully... for me that is important and its something I value. And that is probably what the self driving car might take over. And then I wouldn't have anything left... No [laughing] Ok, but thank you for that then!... [laughing]. Then I would need to find something else..."

PROFILE

Anna is a single mother with a school aged daughter who she lives with in a house in a small village. Anna works as a police officer, and it is important for her to be independent and be able to take care of things by herself – such as being able to to change a flat tyre. It is also important for her to feel in control and relaxed, so she takes things with her so she can be prepared for the unexpected.

Skills

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Insight

People are proud of being skilled drivers and are afraid of loosing that skill, even though it will deteroriate with age or through using more automated driving.

EXAMPLE

Lotta: "Lars' [her husband] mother is elderly and has problems with moving, so she is very dependent on her car and she recently got a new one. She says: "It's beeping all the time!" and that's because she always gets too close to everything and she can't understand why it's beeping so much [laughing]..."

Lotta: "Anyway, it's really good for the elderly with beeping cars..."

Lars: "Absolutely."

Lotta: "We are in the phase where it is a bit sensitive to discuss [with their elderly parents] how long they should be able to drive a car."

Lars: "Yes, it's a tricky question."

Skills

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Implication

How will it be possible to maintain driving skills when people get less driving practice in AD cars?

SCENARIO

What will an AD driving school look like?

Skills

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Question

When the AD car fails in a possibly difficult situation, how would people know how to handle it without driving skills?

What future skills will the drivers and passengers of an AD car develop?

Skills

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Future

Lotta: "As Jakob said one day, 'Mum what do you think? I don't think that my children will need to get their driving licence. An Uber will probably come and pick them up...'"

SCENARIO

Imagine a future where everyone could equally use an AD car, without having to have a driving licence. But would some people still be excluded? – what inequalities need to be addressed?

Expectations

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Quote

Jonas: “At the beginning of the drive, when the indicators went on, there was no visual information about which way that implied. I didn’t know if the car was going right or left. At that point I felt I would like to see which way it was going to turn.”

PROFILES

Jonas is a young professional engineer in his mid 30s. He drives to work every day.

Expectations

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Quote

Miguel: "I've always been very… I wouldn't say car dependent but… a car means freedom and liberty. If you want a mini break in a normal day and you have a car, you can drive for 2 or 3 hours and get quite a long way. You can be in Halmstad in 1.5 hours, you can go to Stockholm and it's still affordable. If you go by car in the winter you don't need to stand in a bus with other people coughing in your face, which doesn't feel like good quality of life. To me, having a car means having good quality of life."

PROFILES

Miguel is divorced father of two young children who works in a professional position. He drives the children to school and home, and commutes to work every day by car.

Expectations

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Insight

Most people expect AD cars to drive in a particular way. They might want the car to learn from their way of driving, or to adopt another particular style that they feel familar, confident and safe with.

EXAMPLE

Bengt: "I'd rather have some information showing me what's going on and what kind of a decision the vehicle is supposed to take. Perhaps not too much, but some information… For instance, how far is it to the next certified road, how far is it until the certified road ends. And I guess that the vehicle knows that it is going to change lanes a few seconds before it starts indicating, so I'd prefer to know that because then I could be more prepared for it changing lanes soon."

Expectations

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Implication

Some functions are expected to be uniquely and diversely enabled for a smooth AD experience.

SCENARIO

What will happen if you want to change lanes and another driver wants to prevent you from merging into the same lane?

Expectations

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Question

When would people want AD to be responsible and adaptive and when not?

How can we balance automation and a variety of personalised expectations?

Expectations

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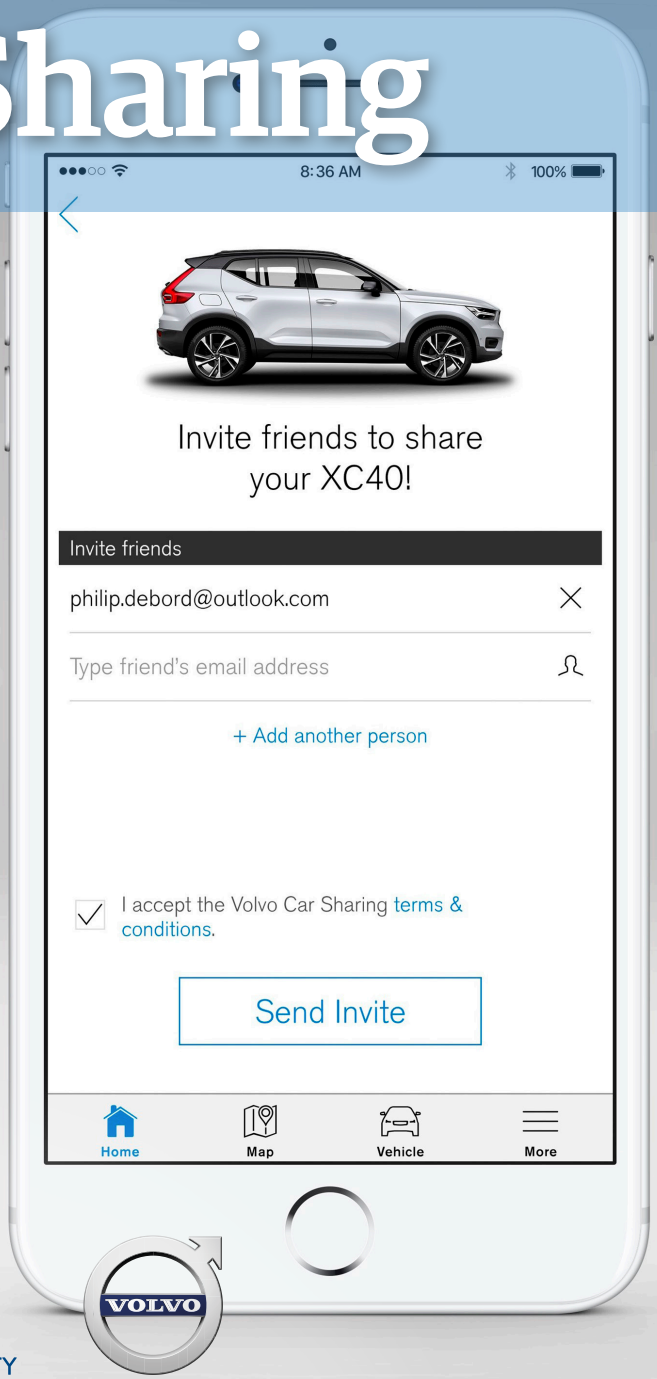
Future

Expectations can be grouped in two ways. One group expects AD cars to be singular and uniform, the other group would want AD cars to be flexible and personalised.

SCENARIO

Imagine a future, where all AD cars are the same, where we have removed all differences in driving style, where we have no freedom in how we operate the car and where all car companies produce the same standardised cars. How would this feel to live in, in contrast to a future where we have a mix of AD cars with personalised driving styles and different human driven cars which are all defined by multiple stakeholders.

Sharing



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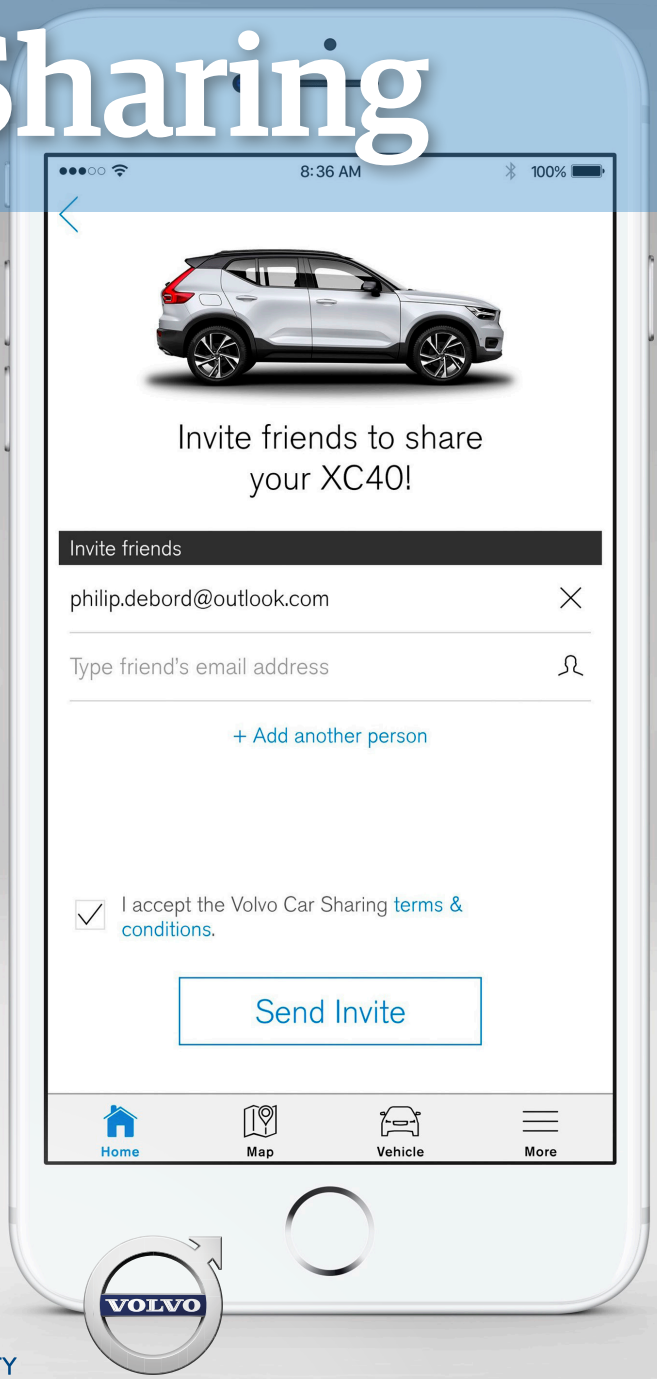
Quote

Christian reflecting on car pooling: "We're not planning our future very much, we're more spontaneous doing things and you can't do that much spontaneous things with a car sharing because those are booked for the weekend. That could be a problem with car sharing."
Björn: "Yeah, but in the future, because of the environment and because all of us are getting used to sharing things and the economics of course... it seems more reasonable to share cars."

PROFILE

Christian and Björn are a family of two fathers with a young child. Both parents are professionals and commute to work every day by car or by electric bike. They dislike driving long distances, which they do regularly as they visit their parents and friends in Varberg, Malmö and Stockholm.

Sharing



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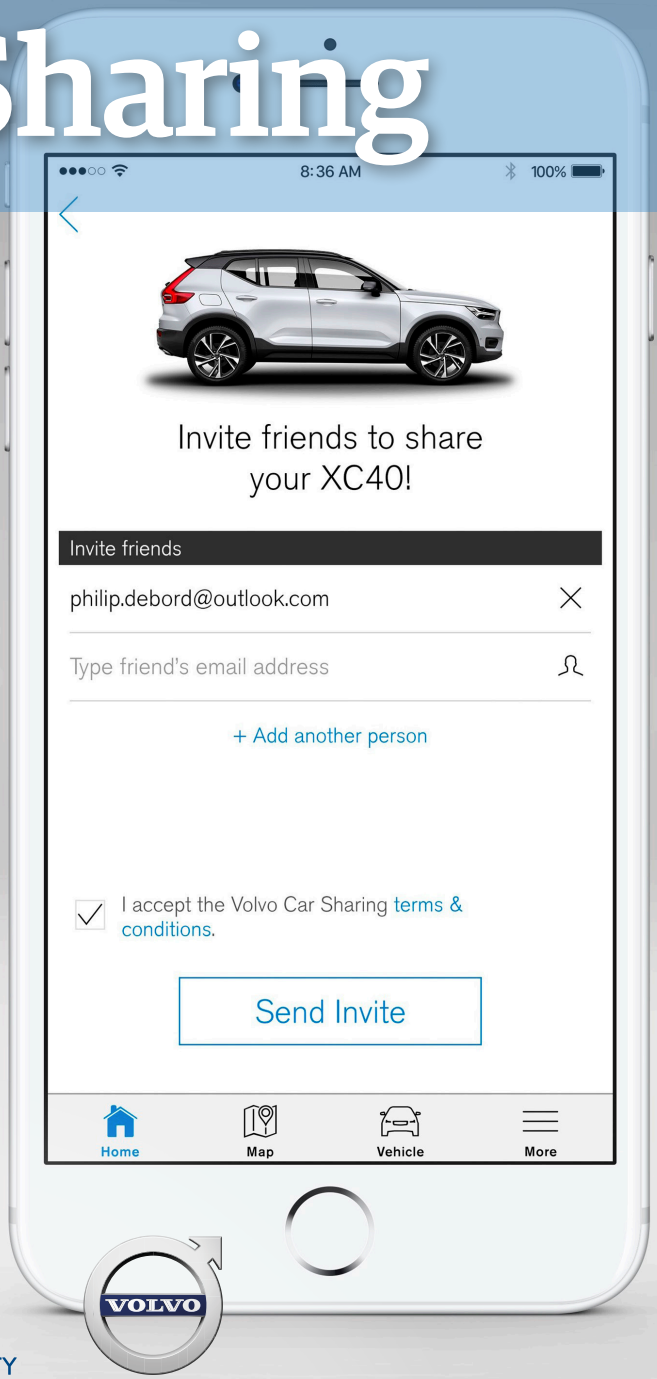
Quote

Miguel: “Now I have a car called Preto, it is 10 years old and it’s a Volvo V70 and it’s an environmentally friendly gas car. Preto is a member of the family.”
Researcher: “Why do you refer to the car as a he?”
Miguel: “I think it’s because of the colour. It’s black.”

PROFILE

Miguel is divorced father of two young children who works in a professional position. He drives the children to school and home, and commutes to work every day by car.

Sharing



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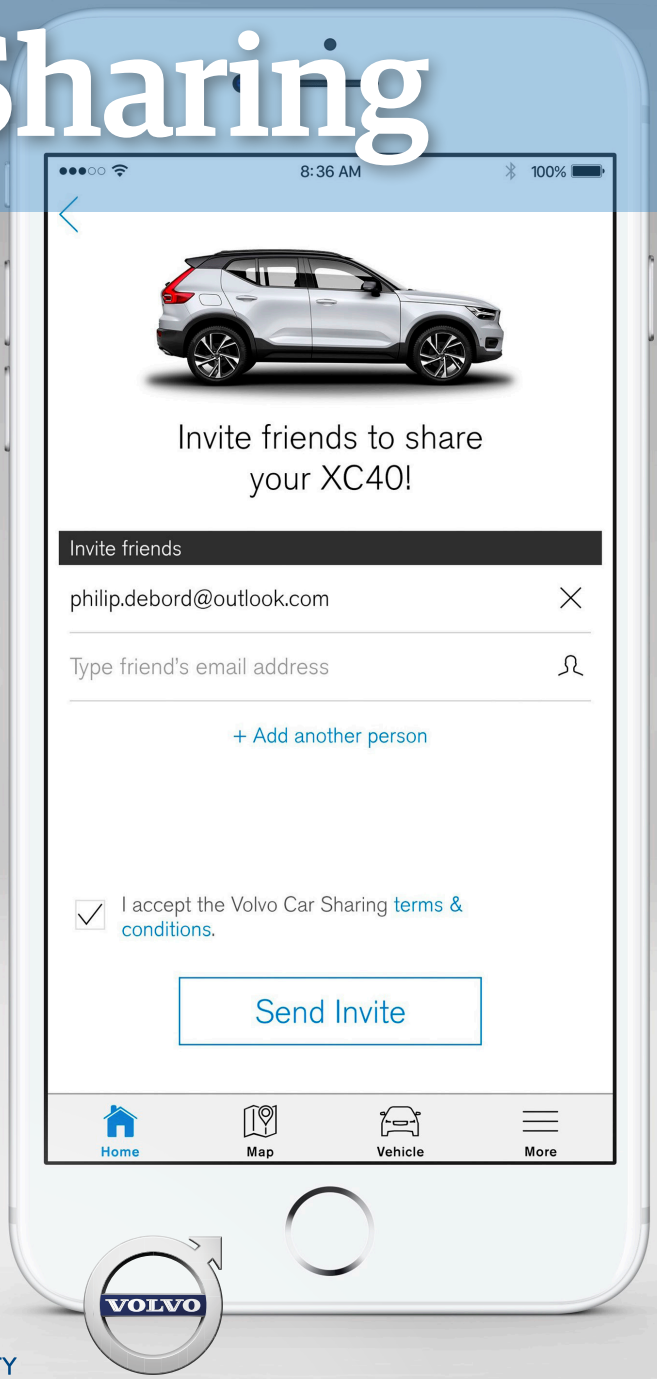
Insight

The car could be part of one's identity. Sharing will depend on the circumstances – when it is convenient it is attractive but in other situations elements of personalisation make it harder for people to aspire to.

EXAMPLE

Paula: "When its developed, so its really self driving... then I won't need my own car if I am going to sleep in it anyway, but if I'm going to drive and enjoy the car, and experience the car, then I want to have my own car."

Sharing



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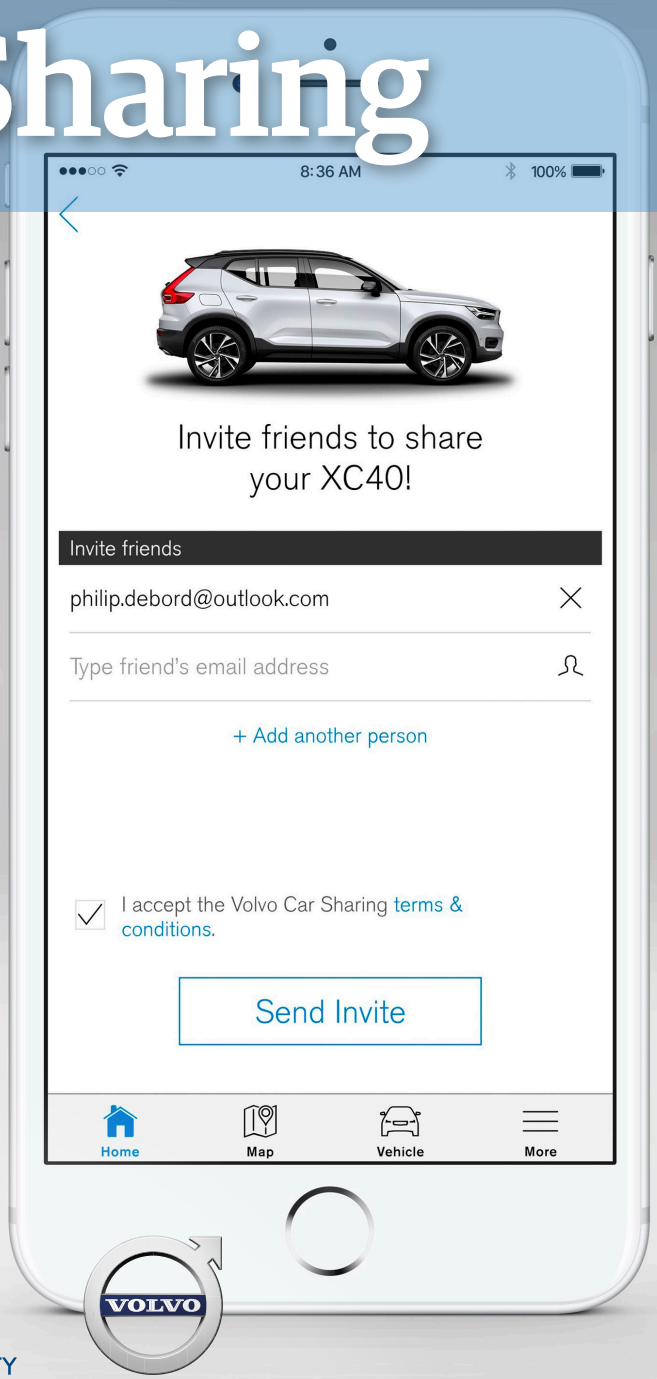
Implication

Personalisation and sharing are two sides of the same question. Car pooling is different from sharing since people still feel a sense of individual ownership.

SCENARIO

What will people personalise if they do not own their own cars any more? And how would people cope with sharing a personalised car?

Sharing



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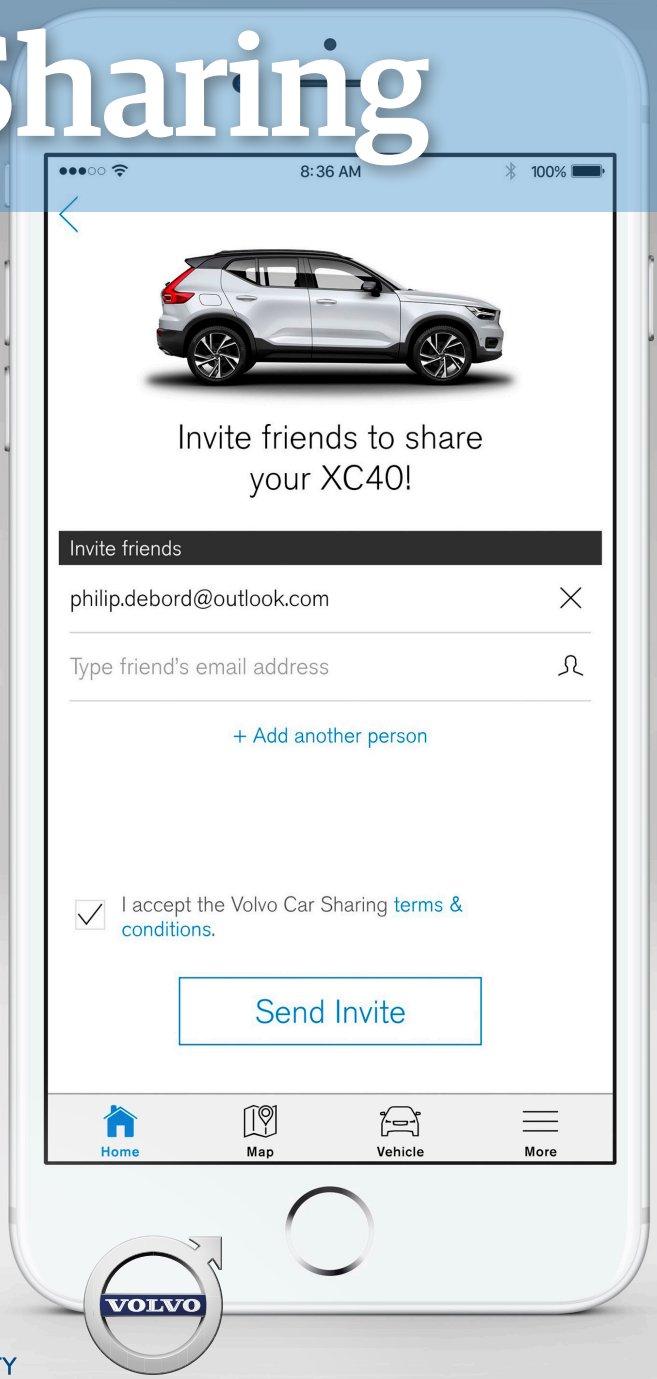
Question

What will happen when sharing relationships break down? What would make this happen?

How many different kinds of car sharing can we imagine – how do they map onto different types of services?

Sharing



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Future

Paula: "When its developed so its really self driving, then I can start to think about using that to be able to sleep [while the car is driving]. Then I won't need my own [car] if I am going to sleep anyway. But if I am going to drive and enjoy the car, and experience the car, then I want to have my own."

SCENARIO

Imagine a future where a range of different models of sharing and ownership are available for users to opt in and out of depending on their needs for different types of travel. People will change their relationship to ownership, and this might lead to the possibility of imagining and developing other forms of owership and sharing.

Routines

Måndag: Fritids 7^{00}-8^{15}
Skola 8^{15}-13^{30}

Tisdag: Skola 8^{15}-14^{40}
Hämta Axel på fritids 14^{45}
Idrott

Onsdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-16^{45}

Torsdag: Skola 8^{15}-14^{50}
Idrott

Fredag: Skola 8^{15}-13^{30}

Läxor: Måndagar direkt efter skolan.

Aktiviteter:

Onsdagar 17^{30}-19^{00} Fotboll

Måndag: Fritids 7^{00}-8^{15}
Skola 8^{15}-13^{30}

Tisdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-14^{45} Vilma hämtar
Onsdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-16^{45}
Idrott

Torsdag: Skola 8^{15}-13^{30}

Fredag: Skola 8^{15}-13^{30}

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Lördagar 14^{00}-14^{45} Jazzdans

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Quote

Researcher: "So you drive the car quite a lot, don't you?"
Carin (mother): "I do think that you [speaking to her husband] drive a lot... so much driving. You drive down to football... Sometimes it's actually like, this spring, it was like you drove the car, and [son] took the bike or took his airboard."
Olof (father): "Yeah, that happens. But then I also had Robin [nephew] who I brought home from work. But often it has been like, Olof comes home exactly when you're supposed to leave [for football]. And then it is so stressful. And then it's just like, 'ah, let's take the car'. It's faster. That's often what its about. Coming home, last minute, and so, huh, away again, into the car and so…"
Researcher: "But it only takes a few minutes?"
Carin (mother): "It only takes a few minutes, yes, sure."

PROFILE

Olof and Carin are the parents of two school age children. They all live in a house in the countryside in a small village which has a small grocery shop, a school and some sports activities for the children, such as football. Neither of them can realistically use public transport and they cannot travel to work together, as they work in different places more than 20km from home. Each of them has their "own" car leased through the husband's own company. They coordinate quite a lot of activities for the children and like to visit their relatives who live within the municipality.

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Insight

Everyday family life involves a mixture of routines and improvisation so that family members can resolve all their transportation needs, such as travelling between home, work, school, shopping and other activities. For a lot of families the car is the only option for resolving the questions about time and space that everyday life activities present.

EXAMPLE

Lars: "There are certain routines that always exist, like back and forth to work, the gym. I train and work out quite a lot, back and forth to your [looking at his son] tennis training, we do a lot, and then we buy groceries. We go and buy things [food] everyday." [laughing]

Lotta: "Then we also visit our older parents, and help them with their computers. And now we do driving practice [with their son], not with the Volvo [which they were using as part of an AD car test], but normally we always take the opportunity to do driving practice [...]"

Lotta: "And then for a bit longer on the weekends."

Lars: "Yes, when we go to the summer house in Fjällbacka [130km each way]. We try to go there for the weekends in the spring, also in the winter [...] Then it is also these "duttkörningarna" [really short trips] up to 10 to 15km."

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Implication

Families with cars are used to having instant access to their car, and living outside the larger cities, parking space is not a problem, but availability of public transport is limited.

SCENARIO

How will the routines of a family change with AD cars without losing their flexibility?

Routines

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Skola 8^{15}-13^{30}

Tisdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-14^{45} Vilma hämtar
Onsdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-16^{45}
Idrott

Torsdag: Skola 8^{15}-13^{30}

Fredag: Skola 8^{15}-13^{30}

Läxor: Måndagar direkt efter skolan.

Aktiviteter:
Onsdagar 13^{30}-16^{00} Megastars
Lördagar 14^{00}-14^{45} Jazzdans

HALMSTAD UNIVERSITY

VOLVO

Question

What might happen if AD cars are not allowed to drive themselves on some areas or roads?

How could AD cars fulfill the needs of families outside the city centers?

Routines

Måndag: Fritids 7^{00}-8^{15}
Skola 8^{15}-13^{30}

Tisdag: Skola 8^{15}-14^{40}
Hämta Axel på fritids 14^{45}
Idrott

Onsdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-16^{45}

Torsdag: Skola 8^{15}-14^{50}
Idrott

Fredag: Skola 8^{15}-13^{30}

Läxor: Måndagar direkt efter skolan.

Aktiviteter:

Onsdagar 17^{30}-19^{00} Fotboll

Måndag: Fritids 7^{00}-8^{15}
Skola 8^{15}-13^{30}

Tisdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-14^{45} Vilma hämtar
Onsdag: Skola 8^{15}-13^{30}
Fritids 13^{30}-16^{45}
Idrott

Torsdag: Skola 8^{15}-13^{30}

Fredag: Skola 8^{15}-13^{30}

Läxor: Måndagar direkt efter skolan.

Aktiviteter:
Onsdagar 13^{30}-16^{00} Megastars
Lördagar 14^{00}-14^{45} Jazzdans

HALMSTAD UNIVERSITY

VOLVO

Future

Björn: "You won't have to take care of future cars, because you will not have an emotional connection to them."

SCENARIO

Imagine a city full of future AD cars. Who will take care of future cars in this city, who will be responsible for them?

Stuff

HALMSTAD UNIVERSITY

VOLVO

Quote

Lars: “Now I know, I usually always have keys in the compartment in the center [in the car], to Veddö [summer place], to the boathouse, extra keys. I always have keys there. Keys that you don’t use that much. The key to the boat is usually there all summer.”

PROFILE

Lars is the father and husband of a family with two grown up children. He runs his own company with his three brothers. Lars comes from the Northern part of the west coast of Sweden where they have a summer house in which the family spends their whole summers. They like to go out on boat trips.

Stuff

HALMSTAD UNIVERSITY

VOLVO

Insight

People use their cars as an extension of their home to store stuff, remember stuff, and to keep stuff that makes them feel comfortable in their cars.

EXAMPLE

Sasko: "When we emptied the BMW... woooh a whole bag, why keep all this in the car?"

Stuff

HALMSTAD UNIVERSITY

VOLVO

Implication

People will need to plan and consider storing belongings in or outside of the AD car.

SCENARIO

How will people cope with the stuff they currently keep in their cars? Will families pack their belongings in and out of the AD car every day, or will the car booths have shared lockers? Or what else could happen?

Stuff

HALMSTAD UNIVERSITY

VOLVO

Question

What might happen in the sharing economy?

How could you leave personal stuff in a shared AD car in the future?

Stuff

HALMSTAD UNIVERSITY

VOLVO

Future

People might lose a place for storing things in the AD world.

SCENARIO

How do you manage to bring all the things that you need to the AD car with you? And how do you make sure that you don't leave things in the car?

Other technologies

Quote

Marcus: “Perhaps sitting in this chair [the driver’s seat] in the car is my favourite, there’s no place as comfortable as this seat… but of course my phone is more or less an extension of my arm, it’s always in my hand... all the time.”

PROFILE

Marcus is a young professional, who grew up in Stockholm and now lives in Gothenburg in an apartment with his partner. He commutes to work every day, he either drives or takes the bus depending on after-work events. He used to share a car with his mother and sister, but now has his own luxury car.

Other technologies

HALMSTAD UNIVERSITY

VOLVO

Insight

People love their cars, but for most, if they had to choose between giving up their car or phone, they would relinquish the car.

EXAMPLE

Håkan used his smartphone continuously for messages and route planning at home, he would even get out of the shower to answer a call. When driving he used his smartphone, dashbord mounted, and hands-free as a contributor to the Waze community and took phone calls.

Other technologies

Implication

AD cars and personal devices like smartphones may be used together to access future services. How should the relationship be designed?

SCENARIO

Imagine a future where you need to identify the AD car you order. What tool will you use to order the car? A phone, a watch or a biometric system?

Other technologies

HALMSTAD UNIVERSITY

VOLVO

Question

What will happen to the AD car when the smartphone fails, breaks, runs out of battery or is lost?

What will the back-up system be if the orders sent to AD cars fail?

Other technologies

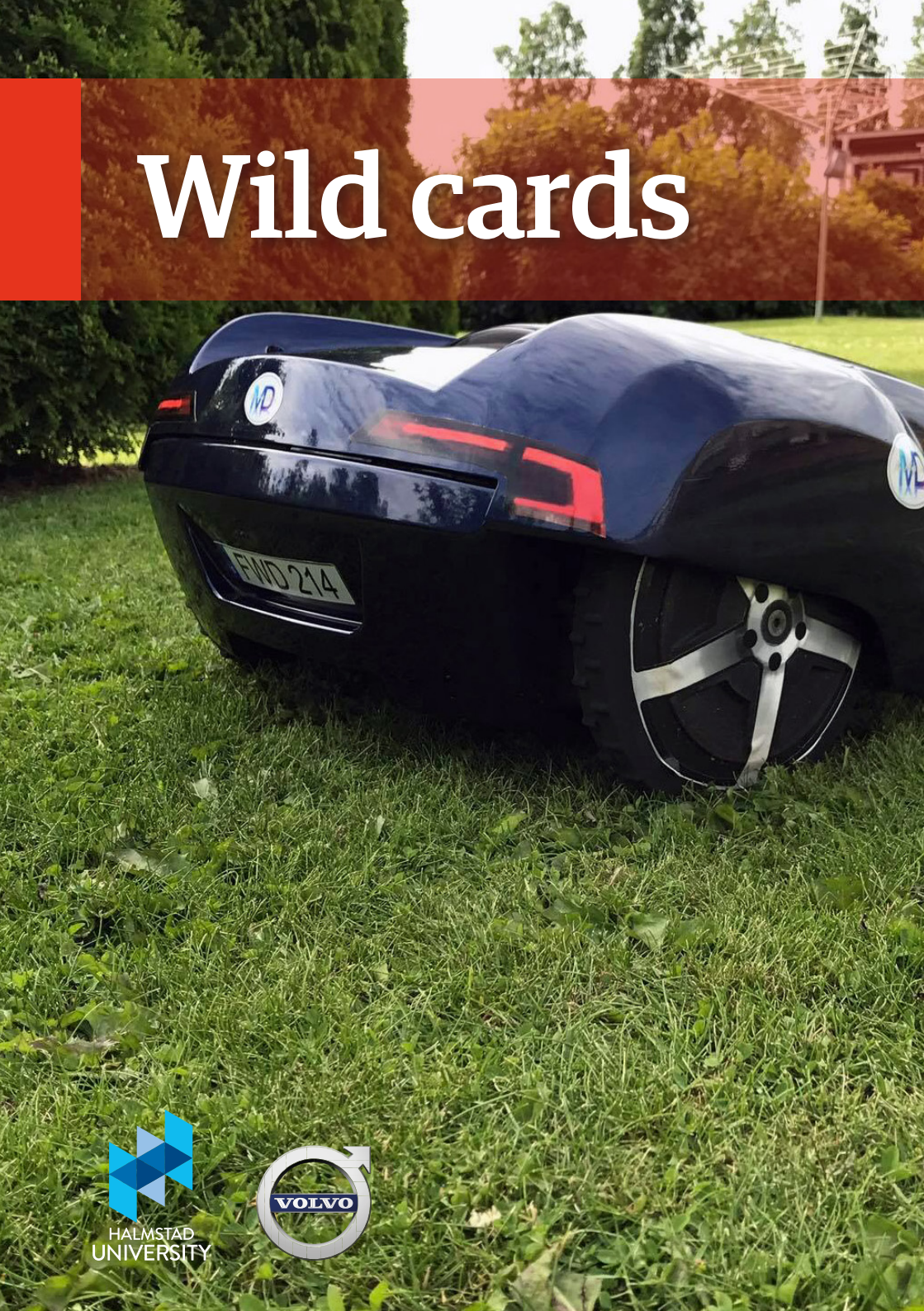
Future

When a colleague called him while driving, Håkan suggested that his car should be able to tell a caller how many people were in the seats so he knew if the call would be private before calling.

SCENARIO

A personal AI assistant could be the central technology that enables us to communicate and connect with AD cars, other services and technologies and other people in everyday life. Sensor technologies will help the AI assistant to know what people and other cars are doing.

Wild cards



HALMSTAD UNIVERSITY

VOLVO

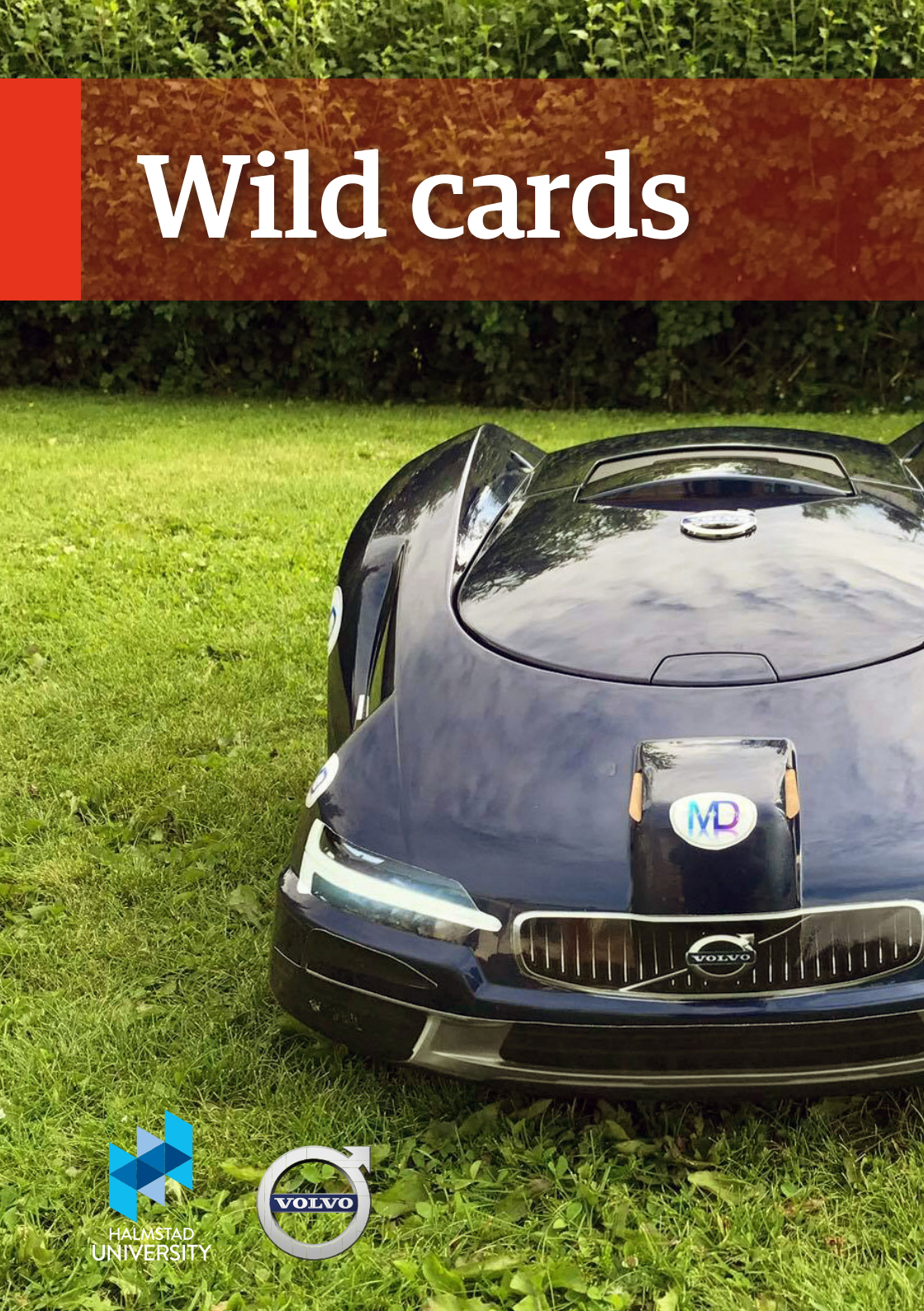
Quote

Håkan: "For some reason I think it gives me luck, it's like a toy my kids got [from a burger chain] ... I've been working in Asia for 15 years, and those people trust in luck ... I don't believe in myths but for some reason I still believe in this guy [the toy]… Since I drive a lot I mean you are involved in incidents and things, and for some reason it always seems like I'm coming out barely hitting something or, I've been so close to hitting things so many times but I never hit them."

PROFILE

Håkan is a father and husband of a family with high school age children. He works globally as an explosives safety troubleshooter. He frequently works overseas and has to have his phone on all the time since being on call.

Wild cards



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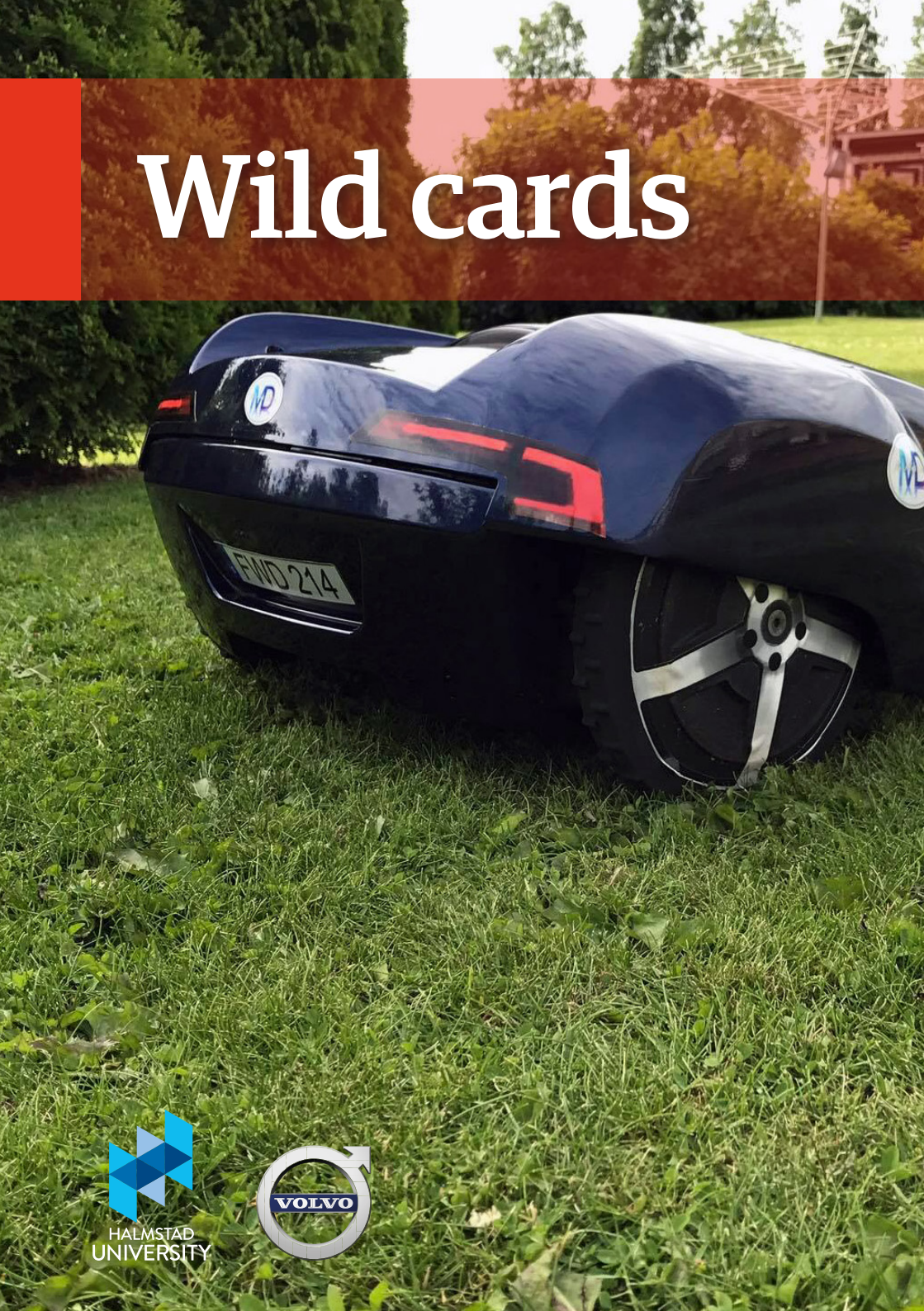
Quote

Tim: “I’m just thinking I had a BMW Z3 and getting into that car was different from the Volvo V60. The BMW is fun to drive and the Volvo is not fun to drive. It’s like they have different types of personalities, depending on what car you step into. If you step into a Toyota Yaris, a V60 or a BMW… the body language, the posture, everything…”

PROFILE
Young professional engineer in his mid 30s.

Wild cards



HALMSTAD UNIVERSITY

VOLVO

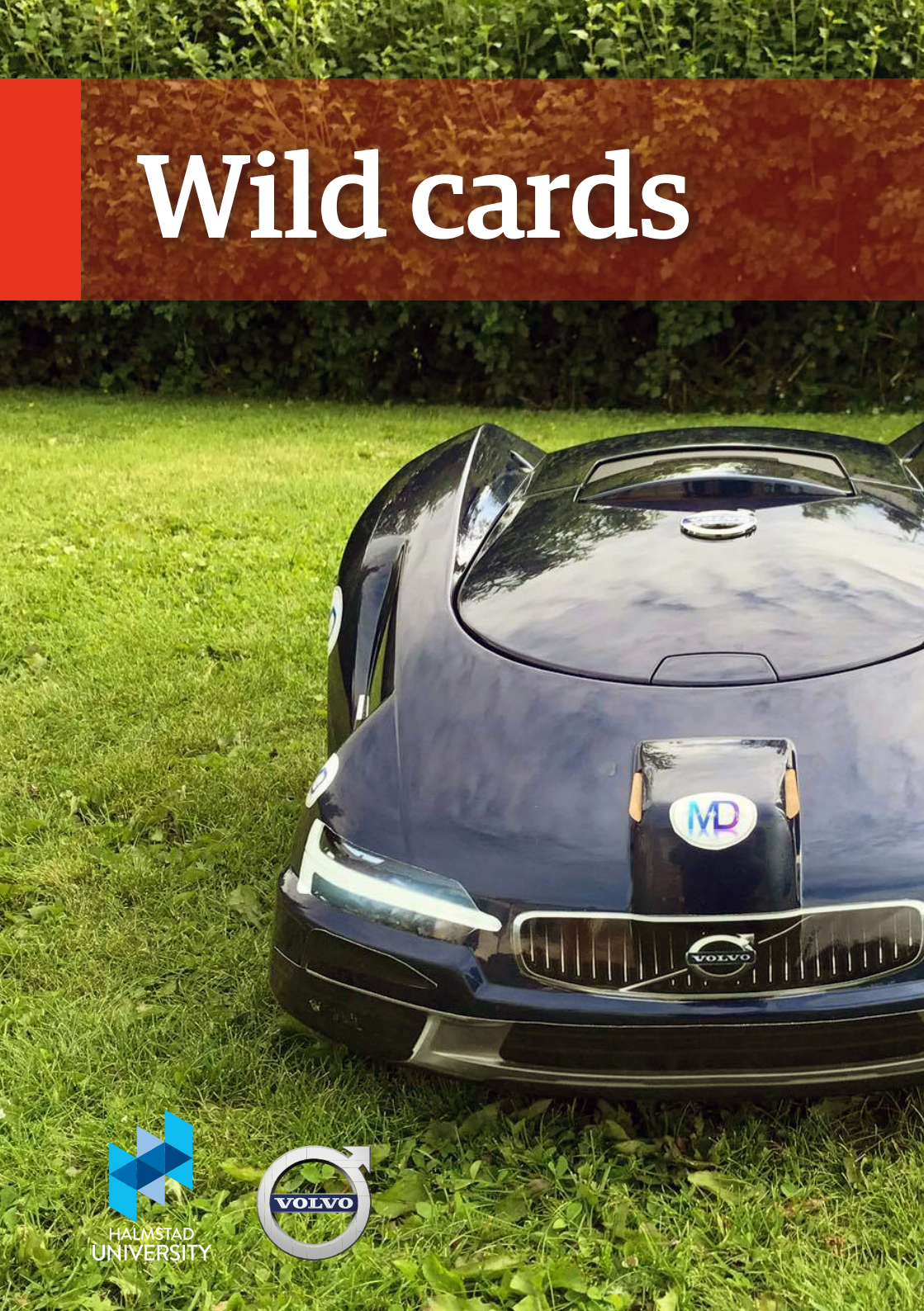
Insight

People don't always make rational decisions or think out their feelings about their cars and driving. Even people who were highly trained in technology preferred to treat some aspects of their car and driving experiences as if they were mystical and unexplainable, telling us they didn't know how or why things 'happened'.

EXAMPLE

Staffan was interested in technologies, and loved test-driving cars, but was mystified by the unsolicited driving notifications he recieved on his smartphone. He told us: "When I'm at my cabin the phone suddenly displays 'you have a 2 hour drive home' … a bit scary… that's just automatically, I have no special app or anything, ... I really don't know how that works... and if I have something in my calendar... that just pops up."

Wild cards



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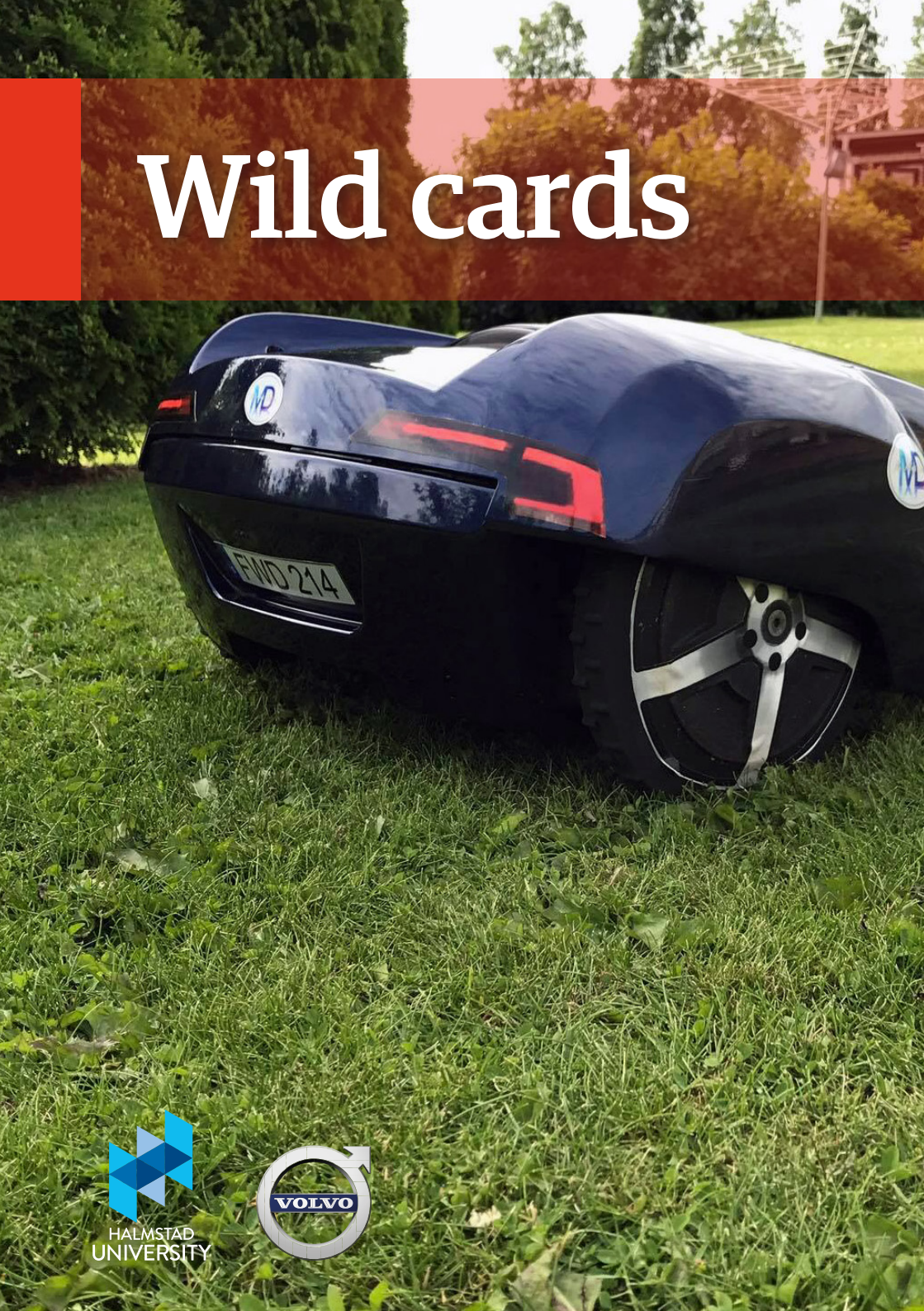
Implication

People will try to attribute emotions and personality to technology that has its own will in some way.

SCENARIO

How will people talk to AD cars about their behaviour and what will they say to other people when they are describing their AD car's behaviour to them?

Wild cards



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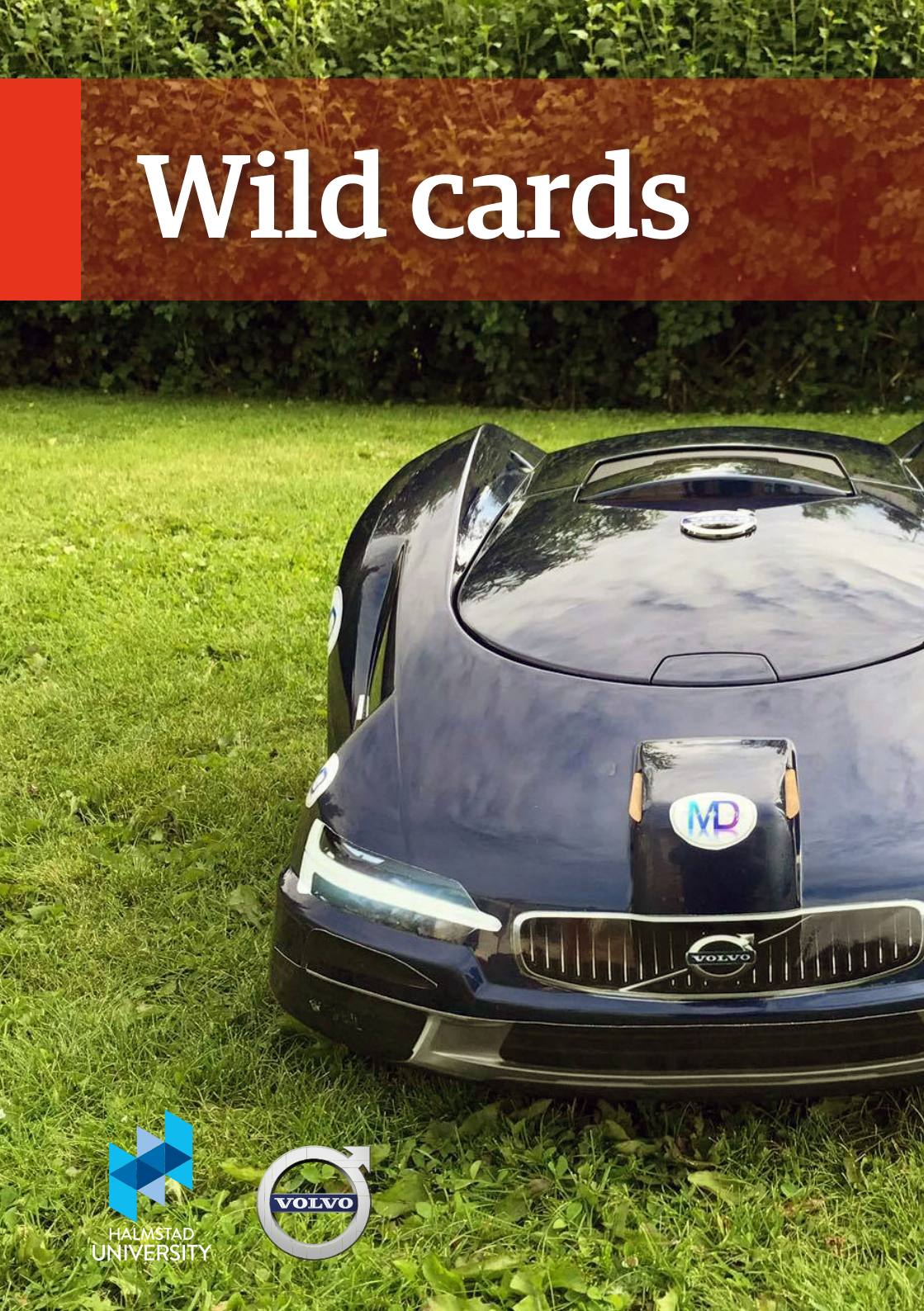
VOLVO

Question

We need to think that intelligent cars have a life to be able to understand their behaviour.

Will people develop relationships with AD cars?

Wild cards



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Future

How and where will we get the kick of driving illegally in the future?

SCENARIO

Imagine a future where small businesses will grow up, run by people who specialise in breaking into AD car systems just like they used to break into mobile phones. Will there be a future of AD car hacking, and what issues will this raise?