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Small talk in a small vehicle: a qualitative study of a shared automated vehicle service integrated in public transport☆

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ABSTRACT

The deployment of shared automated vehicles (SAVs) has the potential to transform urban mobility, yet public acceptance remains a critical barrier. Most acceptance research relies on hypothetical scenarios and quantitative surveys. There is a need for real-world, theory-informed qualitative studies that capture user experience. Rather than a tech-demo or a specialized closed-loop pilot test, this study investigates early adopters of a SAE Level 2 SAV service integrated into the public transport system, with a visible safety driver. Drawing on 12 semi-structured interviews, we apply reflexive thematic analysis informed by the SAVA model, comprising trust, utility, and social comfort, as well as Social Practice Theory (SPT). The aim is to explore how psychological mechanisms and socially embedded practices intersect in shaping acceptance.

Four overarching themes were identified: everyday mobility contexts, utility, trust, and social comfort. Acceptance was not determined by isolated attitudes but by how well the service integrated into existing routines and infrastructures. Trust was found to be layered and anchored in vehicle behavior, human operators, and institutional reputation. Utility hinged on dynamic factors such as pick-up/drop-off design, route transparency, and pricing logic. Social comfort was shaped by ambiguous norms around sharing, spatial intimacy, and service framing. Across all themes, the perceived fit between the SAV and users' lived practices emerged as central to acceptance. Our findings extend current models of SAV acceptance by demonstrating how individual experiences are mediated by competence, materiality, and meaning. We propose that trust, utility, and social comfort function as interdependent practice elements rather than isolated predictors. Design and policy implications include clearer social signaling, accessible service design, and better alignment with everyday geographies.

1. Introduction

Vehicle automation represents a transformative innovation poised to transform urban mobility and reshape transportation landscapes worldwide (Hult et al., 2016; Othman, 2022). By combining automated driving technology with shared mobility services, shared automated vehicles (SAVs) have the potential to enhance efficiency, reduce congestion, and improve access to transportation, thereby addressing critical challenges facing modern cities (Mohammed & Horváth, 2023; Othman, 2020; Rievaj et al., 2016). However, the successful deployment and widespread adoption of SAVs depend not only on technological advancements but also on public acceptance. Technology acceptance is a complex topic, and people's perception of novel transport modes are mixed and vary over time and cultures (Clayton et al., 2020; Freemark et al., 2019; Othman, 2023). There are also unique challenges facing sharing shared vehicles, such as fears of uncomfortable social events or discrimination in ridesharing services (Aasvik, Ulleberg, et al., 2024; Dolins et al., 2023; Moody et al., 2019; Sanguinetti et al., 2019). Understanding how people relate to this novel technology is thus of prime importance to reap the most benefits of SAV technology.

The current study aims to contribute to the understanding of shared automated vehicle acceptance by employing detailed analysis of riders' accounts of their experience riding a novel SAV service. Unlike most acceptance studies that rely on hypothetical scenarios, this paper analyses travelers who have used an on-demand SAVs in ordinary traffic. While these vehicles operate at SAE Level 2 (SAE International, 2021),

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they are among the first SAVs integrated into public transport. A minority of AV acceptance research in general, and SAVs in particular, has been conducted using any theoretical foundation (Greifenstein, 2024). Apart from some notable exceptions, the vast majority of the research conducted uses a quantitative approach, mostly to respondents who have no experience riding AVs or SAVs (Greifenstein, 2024; Hilgarter & Granig, 2020; Nordhoff, de Winter, et al., 2019). To fill this gap in research, we will investigate SAV acceptance using a detailed qualitative approach with social psychological theoretical foundation to interview test users of a new SAV service in Norway. First, we will present the relevant literature supporting our theoretical framework.

1.1. Shared automated vehicle acceptance

Several frameworks have been developed to understand how people react to the introduction of novel technology. The Technology Acceptance Model (TAM) is considered one of the most influential early models, adapted from the more general Theory of Reasoned Action (Davis, 1986; Fishbein & Ajzen, 1975). In TAM, acceptance is simply predicted from users' perceived usefulness and perceived ease of use of any given technology. The simplicity of this theory led to the development of more exhaustive models, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), which has become a key framework during the past two decades (Venkatesh et al., 2003, 2012, 2016). The UTAUT also integrated eight other frameworks, like diffusion of innovation theory and social cognitive theory (Bandura, 2001; Rogers, 2003). The first iteration of the UTAUT included the factors performance expectancy, effort expectancy, social influence, facilitating conditions, as well as moderators like gender and age. Later additions, extensions, and adaptations include adding factors like hedonic motivation, safety, satisfaction with current travel mode, and others (Bellet & Banet, 2023; Blut et al., 2022; Nordhoff, Kyriakidis, et al., 2019; Venkatesh et al., 2012). These advanced frameworks typically predict the intention to use technologies with high accuracy, at the cost of simplicity. This accuracy has also been replicated in acceptance of AVs (Bellet & Banet, 2023; Nordhoff, Kyriakidis, et al., 2019).

Later research has suggested that AV acceptance may be best predicted differently from previous technologies tested using UTAUT-frameworks. Some suggest that a single General Acceptance Factor (GAF) may be the best representation (Aasvik, Ulleberg, et al., 2024; de Winter & Nordhoff, 2022). This may be because most people still have very limited experience with automated vehicles, making the evaluations of them less multifaceted (ibid.). Pilot projects involving automated buses have been a rich source of qualitative data, offering a closer look at user experiences with these technologies. Overall reactions to the vehicles are positive in these investigations, with participants expressing favorable attitudes before and after using them (Booth et al., 2022; Hilgarter & Granig, 2020; Mouratidis & Serrano, 2021). Analysis uncovered actionable feedback for improvement, including requests for increased speed and smoother braking, illustrating how qualitative methods can uncover specific areas for enhancing user satisfaction (Mouratidis & Serrano, 2021). This shows the promise of in-depth research on this novel technology. It also highlights how people may grow more nuanced views of SAVs once they gain more experience with them. In fact, other research suggests that some factors may be more important for the general evaluation of SAVs than others.

Trust has long been found to be a key predictor of AV acceptance (Chen et al., 2023; Choi & Ji, 2015; Zhang et al., 2021), and may be more important here than other technology as traffic may seem like a dangerous environment. Trust is often constituted by beliefs about competence or ability, understandability or integrity, and benevolence or intention of developers (Körber, 2019; Lee & See, 2004; Mayer et al., 1995). It is also often closely tied to safety and perceived risk (Aasvik, Hagenzieker, et al., 2024; Choi & Ji, 2015; Nordhoff, Kyriakidis, et al., 2019). Similarly, rejection of SAVs is often tied to reduced driving pleasure and mistrust in technology (Choi & Ji, 2015; Hartwich et al., 2018; Planing & Dursun, 2018). Safety, trust, and privacy concerns was found to be a main hurdle for SAV acceptance in a recent interview study, cementing its key position (Hou et al., 2025). The usefulness of AVs is also commonly cited as one the most important predictors of intention to use, with tradition back to the Technology Acceptance Model (Aasvik, Ulleberg, et al., 2024; Davis, 1986; Venkatesh et al., 2003). This is also found in some qualitative enquiries, while others find idealized expectations about SAV capabilities, but no expected increase in productivity (López-Lambas & Alonso, 2019; Nordhoff, de Winter, et al., 2019; Planing & Dursun, 2018). Participants in accessibility-focused studies emphasized the potential of SAVs to enable independent mobility for individuals with functional impairments, provided that information is communicated through tailored channels, such as auditory, tactile, or visual formats (Ranjbar et al., 2022). The optimism shown by particularly young males may be driven by how they mostly value the utility of low cost fares and the low value of social interaction with a driver, compared to older populations (Nordhoff et al., 2022; Pakusch et al., 2020). However, some also document positive reactions from older participants, particularly if the physical accessibility of the vehicles is adequate (Booth et al., 2022).

While the adaptation of theory from investigating general technology to investigating AVs has seen good progress, less is known about the adaptation to SAVs. These can be seen as the most beneficial variants of AVs, as they allow for dynamic ridesharing and offering mobility as a service. SAVs introduce additional complexities to the acceptance of AV technology. While AVs are primarily evaluated based on factors such as trust, safety, and usefulness, the shared context of SAVs adds layers of social and logistical considerations. These vehicles require individuals to share confined spaces with strangers, which can evoke discomfort and hesitancy, even among those who are comfortable using larger public transport modes (Dolins et al., 2023). Key issues include the potential for awkward or unsafe social interactions, lack of privacy, and concerns about discrimination or unfair treatment during the ride (Middleton & Zhao, 2019; Moody et al., 2019). This is corroborated by the significant influence of Social Dominance Orientation on SAV acceptance, suggesting that social dynamics play an important role (Aasvik, Ulleberg, et al., 2025b). While some potential riders report that they perceive the service as no more than a regular public transport option, it is noted as a understudied potential issue for some demographics (Aasvik, 2024; Aasvik, Hagenzieker, et al., 2025; Sanguinetti et al., 2019). Perceptions of the social situation are also found to be a significant predictor of the intention to use SAVs, even when controlling for other psychological and demographic factors (Aasvik, Ulleberg, et al., 2024). The issue of SAV acceptance is understudied, particularly using sound theory and qualitative approaches (Greifenstein, 2024). Recent efforts have employed new frameworks adapted specifically to measure shared automated vehicle acceptance (SAVA), to cover these facets of trust, utility, and social comfort (Aasvik, Ulleberg, et al., 2025a). The insights from qualitative endeavors could enrich our understanding of SAV acceptance and give voice to riders' experiences beyond quantitative survey results.

1.2. Qualitative enquiries

Beyond theoretical models, a growing body of empirical studies has examined how passengers experience automated shuttles after real-world rides. These studies consistently report that perceived safety, comfort, predictability, and trust in the system are central in shaping willingness to re-ride and overall acceptance (Kutela et al., 2024; Long et al., 2025; Molina et al., 2021; Nordhoff, de Winter, et al., 2019; Nordhoff et al., 2020; Öztürker et al., 2024). It has been suggested that focusing on the social benefits and transport equity gained by SAVs could improve public acceptance of the service (Martínez-Buelvas et al., 2025). This holds true for people with different disabilities (Tan & Ho, 2025). An immersive simulator setup suggested that people feel more vulnerable on SAV services at night time (Flohr et al., 2024). These findings prove useful avenues for future development and large-scale testing. Exposure often leads to more positive evaluations than expected beforehand (Feys et al., 2021; Long et al., 2025). However, some find that increased knowledge about SAVs decreases their perceived relevance (Charness et al., 2018; Sitinjak et al., 2025). This could suggest that being more updated on the services' actual capabilities deflates their optimistic visions. Future studies should therefore seek to incorporate real world applications of the services to address this issue.

Some investigations have used more realistic deployments, and find that acceptance may increase after test rides (Pascale et al., 2021). Though several of the studies also note the persistence of uncertainty, system-related discomfort, and occasional discrepancies between expectations and actual performance (Aasvik, Hagenzieker, et al., 2024; Long et al., 2025; Pascale et al., 2021; Peng et al., 2025). Most existing pilots, however, take place in controlled settings using low-speed vehicles on predefined routes, frequently framed as short-term demonstrations (Hagenzieker et al., 2021). This is to be expected, as the technology is largely immature and at early stages of implementation. Studies also tend to treat acceptance primarily as an individual-level attitude, with limited attention to the social dynamics of sharing small vehicles or the role of human operators in partially automated systems (Greifenstein, 2024). As a result, relatively little is known about how users interpret and negotiate automated mobility when the service is integrated into an existing public transport system. The impact of other passengers, as well as the absence of a visible safety driver, is also not well understood. The literature gaps regarding the lack of theoretically informed, in-depth studies using real life demonstrations of SAV services motivate the present study.

1.3. Sociological perspectives on AV ridesharing

While TAM and UTAUT highlight individual perceptions and intentions, there are reasons to believe that local culture and social communities also influence acceptance of technology. The complementary views introduced in social practice theory (SPT) address how collective practices and shared meanings evolve as SAVs transition from novel innovations to embedded societal routines (Batel et al., 2016). By integrating these frameworks with the leading individual psychological framework, we bridge the gap between individual acceptance and the social dynamics of technology adoption, offering a more comprehensive view of how SAVs can gain traction within communities. We seek to theoretically integrate SPT with the established UTAUT lineage, offering a multi-scalar explanation that spans individual intention, shared meaning and materially situated practice. These lenses complement each other by focusing on different levels of analysis, individual attitude and behavior vs. practices and communities.

Social practice theory (SPT) emphasizes the interconnected elements of materiality, competence, and meaning (Shove et al., 2012). Materiality refers to the physical and infrastructural components that enable a practice, such as technologies, objects, and spatial arrangements. Competence captures the skills, knowledge, and practical know-how required to perform the practice. Meaning encompasses the symbolic significance, norms, and shared understandings that give the practice its social relevance. Applied to shared automated vehicles (SAVs), these elements highlight how acceptance is embedded in broader mobility practices. The vehicles themselves, along with supporting infrastructure and digital interfaces, constitute the materiality of the service. Competence involves users' ability to understand and navigate the system, including app use, boarding procedures, and interpreting automated driving behavior. Meaning relates to how ridesharing is socially understood, including expectations about co-presence, privacy, and appropriate behavior.

For example, previous research on car-sharing in Norway identified three distinct proto-practices: active green (environmentally motivated use), local flexible (convenience-driven use), and long-distance holiday (occasional extended use) (Julsrud & Farstad, 2020). These findings suggest that establishing SAVs as a viable mobility practice will depend on how successfully these elements are integrated into everyday life and whether the practice can be stabilized across diverse user groups (Julsrud & George, 2020; Kent & Dowling, 2013). We further imply that utility, trust, and social comfort, the pillars of the SAVA framework, can be interpreted as practiced elements of materiality, competence and meaning in SPT (Aasvik, Ulleberg, et al., 2025a; Shove et al., 2012). Positioned at this intersection of theory and practice, we seek to integrate perspectives rarely offered in transport psychology. We aim to contribute both conceptually and empirically, through qualitative insights that expand and refine the SAVA framework. Because other dominating frameworks in AV acceptance like the UTAUT only vaguely incorporates cultural factors, examining the links to an already established theory like SPT could be enlightening (Blut et al., 2022). The current paper will not only further investigate the novel SAVA framework using qualitative interviews with real riders, but we will also attempt to expand this literature into the realm of social practices. This will allow the analysis to go beyond individual psychological factors that often dominate the field, to a meso or sociocultural level.

1.4. Research question

This study examines how early users experience a shared shuttle service equipped with SAE Level 2 automated driving functions (SAE International, 2021). Several studies have investigated passenger experiences in SAV and shuttle pilots, yet few have analyzed services that are formally integrated into an existing public transport system (Kutela et al., 2024; Long et al., 2025; Molina et al., 2021; Nordhoff et al., 2020; Öztürker et al., 2024). Many previous deployments have operated as short-term demonstrations at low speeds on pre-defined routes. In contrast, the service examined here is embedded within Norway's public transport network and intended as operational rather than experimental. The current pilot operates with SAE Level 2 automation, but is intended to increase this incrementally. This provides an opportunity to analyze user experiences within a more realistic mobility context. Existing studies provide valuable insights into post-ride perceptions of early automated shuttles. Yet, less is known about how users experience shared, partially automated services that are integrated into a public transport system and used in everyday mobility.

To analyze these experiences, we combine individual-level perspectives from the newly developed SAVA model with Social Practice Theory (SPT), which foregrounds the interplay of meaning, materiality and competence in everyday mobility. This integrated approach enables a layered understanding of SAV adoption, capturing both psychological evaluations and the socially embedded practices through which people make sense of new transport modes. Through in-depth qualitative interviews, we identify how users evaluate and negotiate their experience of riding in a partially automated shared service. Our analytical

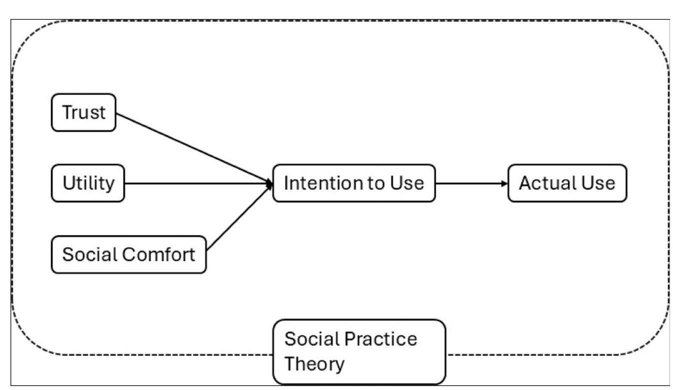

Fig. 1. Study model showing the proposed role of theoretical approaches, with the SAVA-framework at the individual level and Social Practice Theory at the *meso*-level.

approach is summarized in Fig. 1.

The figure presents a conceptual model linking trust, utility, and social comfort to intention to use, which in turn is expected to influence actual use. While actual use is not directly measured in this study, all participants had real experience with the service, meaning that their evaluations are grounded in actual use rather than hypothetical scenarios. The construct is therefore included to situate the SAVA framework within a broader acceptance process. The empirical analysis focuses on users' experiences and evaluations, while Social Practice Theory is used to contextualize these within everyday mobility practices. The study aims to provide an improved understanding of how users experience riding in a SAV service integrated into public transport rather than as private vehicles. The research gap we try to fill is the investigation of theoretically informed, in-depth investigations of realistic early SAV deployments. Our guiding research question is: How do test users experience and evaluate shared automated vehicles (SAVs)? To clarify the analytic focus, we address the following questions:

1) How do passengers characterize their immediate ride experience, including perceptions of trust, utility, ease of use and comfort?

2) How do social and contextual elements such as interactions, co-presence with other passengers and the visible role of the safety driver, influence how the service is understood and evaluated?

3) How do these experiences connect to broader mobility practices, expectations and willingness to adopt similar partially or fully automated services in the future?

2. Data and methodology

2.1. The current pilot test

There has been many tests with SAV services in Europe and in Norway (Hagenzieker et al., 2021). Most of them have been conducted using small shuttles seating 6–8 passengers and averaging around 15 km/h. They have been driving at SAE Level 3, requiring a safety operator to be present at all times and take control whenever necessary (SAE International, 2021). Tests in Norway have been using *Navya* and *EasyMile* shuttles, with some exceptions like the 52 passenger bus project in Stavanger reaching 40 km/h (Wardrum, 2024). Ruter, the main public transport provider in the Oslo region, has tested multiple implementations. Several of these early implementations have been found to be less than optimal. The shuttles are unpredictable drivers, often being too passive and slow, and the lack of information about the pilots made people critical about their purpose (Aasvik, Hagenzieker, et al., 2024; Debbaghi et al., 2025; Julsrud & Aasen, 2024; Mirnig et al., 2022; Nordhoff, de Winter, et al., 2019; Pokorny & Høye, 2022). They also sometimes violate the rights of vulnerable road users and are reported as being too ineffective to be of any real value. This leaves a bad impression on many of the people who interact with it.

Ruter, the public transport authority in Oslo, has initiated a new pilot that aims to test higher levels of automation in an everyday public-transport setting (Meyer, 2024; Ruter, 2023). The service examined in this study uses NIO ES8 vehicles configured for dynamic ridesharing. Although the long-term ambition is to achieve SAE Level 4, during the period of data collection the vehicles operated at SAE Level 2 (SAE International, 2021). The system could support steering and speed control under certain low-speed conditions, but the safety driver retained full legal responsibility for continuous supervision and intervention. A professional safety driver was seated at the controls during all trips, and their presence was clearly visible to passengers. Recently, the vehicles have driven autonomously upwards of 80 % of their operation hours (Ruter, 2025).

The service operated in the suburban district of Groruddalen in Oslo. Unlike fixed-route shuttle pilots, the vehicles functioned as an on-demand service without predetermined routes. Passengers could request rides between multiple designated pick-up and drop-off points. Rides could be shared if the routing algorithm identified an efficient match, meaning that passengers could encounter other travelers during the trip. The vehicles operated in ordinary mixed traffic on local streets with moderate traffic volumes and speeds up to 60 km/h.

Before boarding, participants were informed that the service combined automated driving functions with manual oversight and that a safety driver would remain responsible for the vehicle throughout the ride. The interview guide did not include a direct question about participants' understanding of the vehicle's automation level, although several participants commented spontaneously on this topic during the interviews. The vehicles used in the pilot had a seating capacity of up to three passengers, allowing for potential ride-sharing between multiple users. However, during the period of data collection, shared rides were relatively limited. Most participants either travelled alone with the safety driver, and only a minority reported direct experience with co-riding alongside other passengers. Final numbers on the amount of shared rides remain undisclosed (Ruter, 2025). Fig. 2 shows the vehicles operated by Ruter.

During the pilot in Groruddalen, a total of 69 designated pick-up and drop-off (PUDO) points were implemented within the Groruddalen service area (Ruter, 2025). The spatial distribution of these points resulted in a coverage rate of 17 % within 200 m walking distance, 48 % within 400 m, and 74 % within 600 m. This reflects a relatively sparse but expanding network typical of early-stage on-demand services, where accessibility depends on proximity to designated stops rather than fixed routes. These spatial characteristics provide important context for participants' experiences, particularly regarding walking distances, accessibility, and perceived convenience of the service.

2.2. Semi-structured interviews

To explore the acceptance of SAVs in depth, this study employs semi-structured interviews with test users of a new SAV service in Norway. This method is particularly suited for capturing personal experiences, nuanced perceptions, and social dynamics that cannot be fully understood through standardized surveys or purely observational studies (Willig, 2013). Semi-structured interviews allow for a flexible yet systematic exploration of key themes, ensuring that all participants address central topics, such as trust, utility, and social considerations, while also providing room for individual reflections and unexpected insights. Given that many existing studies on SAV acceptance rely on quantitative methods with hypothetical scenarios, this qualitative approach provides a unique opportunity to engage with actual users and understand how direct exposure to the technology shapes their attitudes and expectations (Greifenstein, 2024). Additionally, this method encourages a comfortable and open environment for discussion, as opposed to group interviews, which is essential when exploring potentially sensitive topics such as safety concerns, social discomfort in shared spaces, and trust in automation. The approach also accommodates diverse perspectives, allowing participants with different backgrounds, travel habits, and levels of technology enthusiasm to express their views freely. By analyzing these in-depth accounts, the study seeks to uncover rich, experience-driven insights that contribute both to theoretical discussions on technology acceptance and practical improvements in SAV deployment. We chose to conduct interviews digitally, as this medium becomes increasingly common. This was also done due to practical concerns with securing a neutral and suitable place for interviewing as well as travel limitations.

2.3. Interview guide

The semi-structured interview guide was designed to explore key factors influencing SAV acceptance, drawing from established technology acceptance theories and social-psychological frameworks. The full interview guide is presented in the appendix. The guide includes open-ended questions that encourage participants to share their experiences freely while ensuring that core topics, such as usability, trust, safety, and

Fig. 2. The NIO ES8 vehicles operated in Ruter's pilot in Groruddalen.

social dynamics, are systematically addressed. The structure allows for flexibility, enabling follow-up questions based on participants' responses to capture unexpected insights. The guide also incorporates contextual factors, such as participants' prior knowledge of automated vehicles, their expectations before using the service, and their post-experience reflections. To facilitate a comfortable and open discussion, the interview begins with general questions about the participant's background and typical travel habits before progressing to more specific topics related to their experience with the SAV pilot.

Here, we use the SAVA framework of trust, utility and social comfort to structure the questions, with probing questions for different elements that may constitute these three factors. Because these three factors are largely thought to be the practiced elements of the social practice theory's (SPT) meaning, materiality, and competence, we did not include specific SPT questions. Rather, the probing beneath each of the three factors was aimed precisely at uncovering how the SAV experience manifested psychologically, as well as more culturally.

The final section invited participants to suggest potential improvements, providing insights into user-driven design considerations. This approach ensures that the interviews balance structure with flexibility, allowing for both comparability across participants and depth in individual narratives. This could also serve as a way for people to remember the materiality of the service, and what their physical interaction with the service was like. The interview guide was tested on a colleague resulting in minor adjustments, mostly to question order. The interview was estimated to take approximately 45 min.

2.4. Participants

For the first period of experimental validation at the start of 2025, Ruter invited participants to a closed test. After some weeks, their service opened to a wider audience. Some of these early test users were registered with contact information by Ruter. We received contact information from 18 users. These 18 were adults over 18 years of age consenting to being contacted for research purposes. The single other eligibility criterium was that they had used the service at least once. Of these, 12 agreed to participate in our research study using digital interviews. The remaining six were unwilling to participate, and no further test users registered to be reachable for research interviews. A smaller sample of 12 participants is not enough to generalize or do statistical analyses, but even small samples may be enough for semi-structured interviews and in-depth analysis (Qu & Dumay, 2011). The sample is also of special importance, as these represent the first pilot users of a SAV service deployed in a public transport setting. During the initial closed testing phase, the pilot involved a limited number of invited users, though the total number of participants in this phase was not formally recorded by Ruter. The 12 interviewees were recruited from the pool of 18 users who had registered their contact information and consented to be approached for research in this phase. As such, the sample reflects a subset of early adopters who were both willing and available to participate.

Informed consent was ultimately collected orally, but all participants received a detailed written account of their rights as participants. This was also briefly summarized at the start of each interview. Participants were incentivized to be interviewed with a 300 NOK (approx. 25 euro) universal gift card. The respondents had diverse backgrounds. Several ethnic minorities were represented. The oldest participant was 75 years and the youngest 22. There were seven men and five women. A summary of participant characteristics is shown in Table 1.

Some participants had taken several test trips. While most test users naturally are quite tech-interested, some of our respondents also showed significant skepticism towards AV deployment. Qualitative methodological work emphasizes that sample size in such research should be guided by the concept of "information power," where fewer participants are needed when the sample is highly specific to the research aim, the study is theory-driven, and the data are rich and relevant (Malterud et al., 2016). In our case, the sample consists of early users with direct experience of a novel SAV service, aligned with a focused research question and established theoretical framework, supporting a relatively high level of information power. Furthermore, studies on thematic analysis and interview-based research suggest that key themes can often be identified within relatively small samples, with indications that code saturation may occur within approximately 6–12 interviews in focused studies (Braun & Clarke, 2006; Guest et al., 2006). Given the specificity of our sample and the depth of the interviews, we consider the sample size sufficient to generate meaningful qualitative insights into early user experiences of SAVs.

2.5. Ontology and reflexivity

This study is grounded in critical realism. This approach acknowledges that social and psychological factors influencing SAV acceptance exist independently of individual perceptions but are interpreted through subjective experiences (Archer et al., 2013; Wiltshire & Ronkainen, 2021). While user attitudes and behaviors are shaped by real-world structures such as technology design, transport systems, and infrastructure, these elements are also socially constructed and context dependent. Knowledge about these phenomena is inherently mediated by subjective experiences, meaning that insights must be interpreted through social and psychological lenses. By employing semi-structured interviews, this study embraces an interpretive approach that allows participants to articulate their perceptions, while also recognizing that these perceptions are shaped by deeper social and systemic influences. This means that participants' accounts will be informed by the specifics of the pilot they tested, as well as their specific context. Our theoretical approach is aimed at collecting both psychological and sociological points of view. This perspective enables a balanced exploration of both individual experiences, cultural contexts, and broader structural determinants of SAV acceptance.

As researchers embedded in the field of transport psychology, the authors' perspectives on SAVs are shaped by both our academic backgrounds and institutional affiliations (Lazard & McAvoy, 2020). This

Table 1
Participant characteristics and demographics.

Respondent	Age	Gender	Everyday mobility	Tech-interest	No. SAV trips
R1	Middle-aged	Woman	Work commute by train or metro. Sometimes carpooling	Very interested, happy with Ruter's test	One
R2	Middle-aged	Man	Connecting buses	Interested, but skeptical. Works in IT	One
R3	Elderly	Woman	Limited travel, metro occasionally	Curious, no previous AV knowledge.	One
R4	Young adult	Man	Frequent public transport user	Doubting, but keen on testing AVs	One
R5	Middle-aged	Man	Mostly car user	Fascinated by new tech, somewhat hesitant	One
R6	Young adult	Man	Bicycle or public transport. Mostly bus	Not very interested, knows of some AV pilots	One
R7	Young adult	Man	Metro and bus, mainly public transport	Very interested, studies AVs	Approx. seven
R8	Young adult	Woman	Public transport, walking. Mostly metro	Was quite skeptical, has turned somewhat optimistic	Four or five
R9	Adult	Man	Previously car, now more public transport	Curious and interested, uses AI for work	One
R10	Young adult	Woman	Train or Buses to study and work	Always been eager to try new tech, uses AI models regularly.	Closer to 10 trips
R11	Middle-aged	Woman	Previously cycled, now mostly uses train	Medium interest, keen on trying new things	Three
R12	Adult	Man	Mainly bus and metro, but sometimes bicycle, to/from work, private motorized vehicle for leisure activities and shopping.	Above average, frequently uses smart home systems	Five

position provides access to ongoing policy discussions and pilot projects, but it also necessitates reflexivity in how we interpret findings. Our professional interest in technology acceptance, particularly with trust, utility, and social comfort, influence our approach. Particularly in framing research questions around psychological and social factors rather than purely technical or economic considerations. Additionally, our familiarity with emerging mobility technologies and engagement with transport research may create an implicit bias toward viewing SAVs as a promising innovation. However, following the development closely also highlights the current shortcomings of the nascent technology. We acknowledge the importance of capturing critical perspectives from users who may be skeptical or resistant to this technology. Furthermore, conducting research in Oslo requires attentiveness to local socio-demographic factors, including how different communities engage with and perceive new mobility services. Ruter, who has pioneered SAVs in Oslo, is also partner in the research project, but has not been involved in the current study. By maintaining a reflexive stance throughout the research process, we strive to minimize bias while acknowledging the influence of our own position within the study.

2.6. *Reflexive thematic analysis*

This study employed reflexive thematic analysis to explore participants' experiences with SAVs (Braun & Clarke, 2006, 2019). Reflexive thematic analysis is well-suited for examining complex, socially embedded phenomena. It supports both structure and interpretative flexibility, making it compatible with our study's critical realist epistemology, where participant accounts are understood as reflecting real underlying structures (e.g., infrastructure, trust dispositions) while also being shaped by the researchers' theoretical positioning and experiential knowledge. Our analysis drew on a hybrid strategy, integrating both theory-driven (top-down) and data-driven (bottom-up) approaches. While we were guided by the pre-existing constructs from the SAVA model and social practice theory, we remained open to inductively derived insights from the participants' own language and meaning-making. This combination allowed us to balance theoretical relevance with emergent, context-specific nuances.

We used a similar approach to the six phases of thematic analysis: 1) transcriptions/familiarization with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report (Braun & Clarke, 2006; Byrne, 2022). However, the process was recursive rather than strictly linear, and our prior familiarity with the SAVA framework meant that phase 5 was approached with more efficiency. Although the interview guide was informed by the SAVA framework and included prompts related to concepts such as trust, utility, and social comfort, the coding process did not impose these categories deductively onto the data. Instead, initial coding was conducted at a semantic level using participants' own language, allowing themes to emerge inductively. The SAVA framework functioned as a macro-level lens rather than a fixed coding structure and was primarily used in later stages of analysis to interpret and organize the emergent themes. Still, the resulting themes were not a direct reproduction but rather a refinement, enriched with sub-themes that provided greater nuance and variation. This approach reflects a hybrid analytic strategy, combining theory-informed data collection with inductive coding and theme development.

2.6.1. *Coding and theme generation Procedure*

The first author conducted and transcribed the first ten interviews, while the second author handled the last two. Both researchers engaged with all transcripts and collaborated on the codebook. Data analysis was carried out using NVivo 14. Initial coding began with semantic-level codes closely aligned with participants' wording. These early codes captured bottom-up insights that later informed the generation of sub-themes. In parallel, theory-informed codes were applied to segments that corresponded with pre-established constructs, particularly from the SAVA model. Following this first round of coding, the researchers developed a preliminary thematic framework. The transcripts were then recoded using this structure, allowing for better alignment between emerging codes and overarching themes. Throughout, codes were compared both within and across interviews to ensure internal coherence and to capture interparticipant variation. This iterative approach involved reworking sub-themes, combining or splitting codes where necessary, and preserving the diversity and contradictions in user experiences. Diverging perspectives were retained within themes rather than collapsed, reflecting the complexity of the data.

Each interview produced between 39 and 64 unique codes, and between 150 and 378 total references, reflecting differences in participants' expressiveness and the breadth of relevant content. The result was a thematically structured, yet richly contextualized, representation of how participants made sense of the SAV service. While frequency of mentions was noted for transparency, thematic importance was determined through interpretive depth and relevance rather than count-based metrics.

2.6.2. Reporting our findings

The presentation of results aimed to balance narrative richness with analytic clarity. The results section was organized into the four overarching themes that emerged from our analysis: Everyday Mobility Contexts, Utility, Trust, and Social Comfort. Each of these included several sub-themes, reflecting finer-grained distinctions in participants' accounts. The quotes were selected to capture commonalities while also showcasing outliers and critical counterpoints. Because respondents come from a relatively small pool of test users, we have taken extra steps to ensure their anonymity in this paper. Where relevant, frequency of occurrence is noted, though without implying statistical generalizability. That was neither the aim nor possible given our limited sample. These are simply given to give transparency as to the frequency with which certain themes were discussed in the interviews.

The interpretive work included constant triangulation with theory. For instance, sub-themes under “Utility” were interpreted not just as pragmatic evaluations but also as reflections of materiality and competence, drawing on Social Practice Theory. Similarly, reflections on service ambiguity and seating dynamics were analyzed through the lens of social norms and meaning-making. Throughout the reporting, we maintained a reflexive voice, acknowledging our own theoretical investments (particularly in SAVA) and remaining open to findings that challenged or extended this framework. As such, the analysis represents not an objective truth, but a co-construction between participant perspectives and researcher interpretation.

Breaks in the quotes are noted with (…) and authors' contextual input is noted using [brackets].

3. Findings

Fig. 3 shows an overview of the themes and sub-themes generated by our analysis.

Mentions are included as an indication of frequency of occurrence across interviews, but do not imply relative importance or explanatory weight of themes. In line with reflexive thematic analysis, themes were evaluated based on their relevance to the research question, richness of data, and interpretive significance, rather than frequency alone. Some themes with fewer mentions may reflect particularly salient or contextually important aspects of the user experience. The themes are presented in the following, in the order which most interviews were conducted: mobility context, utility, trust, and social considerations. Two interviews did not follow this order because respondents jumped straight into talking about PUDO-points.

3.1. Everyday mobility contexts

This theme explores individual contexts that shape how participants perceive and engage with shared automated vehicles (SAVs). It includes everyday mobility patterns, interest in technology, and the practical knowledge participants bring into their encounters with the service. These personal factors provide an important backdrop for understanding variations in acceptance and experience. This emphasis aligns with the perspective of Social Practice Theory (SPT), highlighting mobility as a practice embedded in wider socio-material contexts, rather than merely as isolated acts of travel.

3.1.1. Travel habits and mobility context

This sub-theme explores how participants' existing mobility patterns, routines, and needs shape their openness to shared automated vehicles (SAVs). It includes regular travel behaviors like public transport use, driving, and cycling, as well as travel frequency. Experiences of adapting to the SAV as a new travel mode is also included. This reflects whether participants feel they are part of the intended user group, and how the SAV fits into varied and sometimes complex everyday travel situations.

Approximately half of our interviewees described layered modal strategies: rail for longer trips to the city center, bus for intermediate length across town, walking or micromobility for the “last-few-hundred-meters”, and occasionally private car. Participants' diverse mode combinations illustrate that impression of SAVs depends not only on isolated attitudes or rational choices, but also on how comfortably new practices integrate with existing transport routines. One commuter, R10, who studies in the city center and works in Groruddalen listed a daily chain of modes, train, two buses, and walking, and noted that poor timetable coordination adds a significant time delay to every commute. Where scheduled services were thin, the SAV was imagined as a plug-in extension of the network:

R1: “We live in the block that is *furthest* from public transport… If the route could be extended into Munkebekken and stop in the middle of the three housing blocks, that would be perfect.”.

For residents of hillier suburbs, steep gradients or long access walks made conventional transit unappealing, especially for older people or

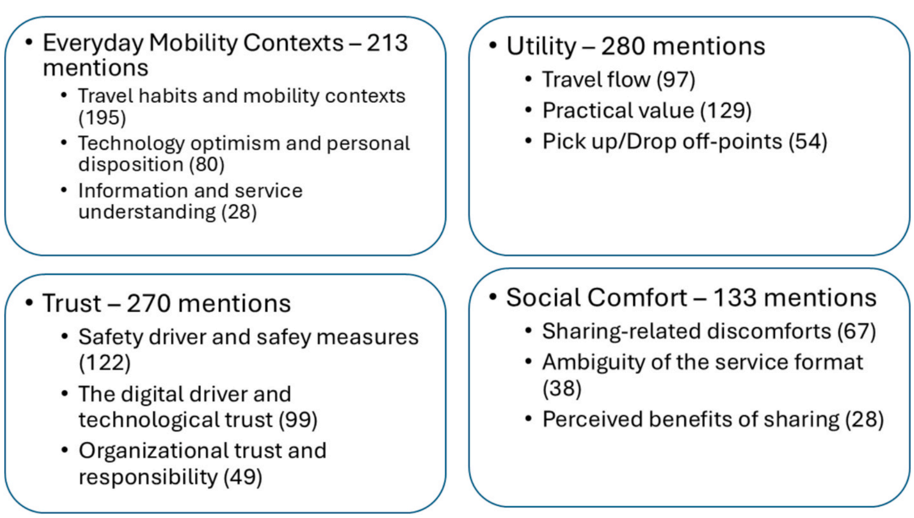

Fig. 3. Overview of themes and sub-themes generated by our reflexive thematic analysis. Mentions are in parentheses and should only be interpreted as an indication of frequency of occurrence. While the overarching themes align with the SAVA framework, sub-themes were developed inductively from the data and are not direct operationalizations of predefined constructs.

when carrying shopping. An elderly resident, R3, described neighbors who had moved away because "it's a long walk and the hills are steep" and public transport was "not good enough". This illustrates how seemingly mundane aspects of built environments, such as topography and infrastructure placement, exert significant influence on the adoption of new mobility solutions. Conversely, R10 without a driving license relies almost exclusively on an express bus and therefore welcomed the prospect of an on-demand complement to the sparse timetable. These accounts underscore an SPT insight: material arrangements such as distance, topography, feeder links impact whether a new practice can be integrated into everyday life.

Some of the informants had used the SAV service multiple times over several weeks. Some trips were done simply out of curiosity, but others found the service already contributing to their everyday travel needs:

R10: "(…) because I don't live that far away, and the stop, well, the stop is in a really random place — there's no actual bus station there, right? (…) so when I see that there's a bus [meaning SAV] at the same stop, just 3 min away and only one hill up, I take that opportunity.

This highlights how the environment and mobility patterns participants find themselves in impacts decisions to use SAVs. The informant was already on the lookout for a familiar bus connection as this was something they were used to. The introduction of a novel service did not disrupt their existing travel behavior but simply slotted into their routine.

3.1.2. Technology optimism and personal Disposition

This theme captures attitudes toward technological innovation and self-driving vehicles, shaped by curiosity, excitement, or personal dispositions. This range of technology orientations demonstrates that acceptance is strongly tied to individual identities and the perceived alignment of the technology with personal values and self-image. Participants expressed views ranging from fascination with automation to reflections on personality traits or familiarity with advanced driving assistance systems (ADAS). SAVs were seen as novel, sometimes luxurious services, with imagined futures and use cases beyond the local context. R11 reported having an optimism that persisted in the face of indifference:

R11: "[in a digital info-meeting] … and it was claimed that, as far as AVs are concerned, most people would probably think that it is something that is suitable for other people, but that they do not need it themselves. I thought, could that be true, because I think it is super exciting – you have to try new things!".

Attitudes to innovation ranged from cautious curiosity to enthusiastic early adoption. Several participants described themselves as "built to try new things" or "very curious" about digital services. R10, who already uses ChatGPT for study and work, framed the SAV as "just another cool technology to test". R9 positioned the vehicle within a longer identity trajectory—shifting from being "a car person" to someone who is comfortable with flexible, shared, or on-demand mobility:

R9: "A few years ago, the car was important to me. Back then, it mattered to show that it was a cool car (…). [But now] I might just as well use Hyre or one of those other [car-sharing] services that are available.".

Such identity shifts suggest that mobility choices are embedded within broader lifestyle practices and can signal deeper transformations in how individuals perceive themselves within societal transitions. Optimism was often infused with future imaginaries, like for R7 "fully self-driving technology, maybe in ten-fifteen years, seems the only direction for transport". Yet, the optimism had limits. Some expressed excitement for neighborhood trips but hesitation about dense city traffic, or complex mixed environments, framing trust in terms of progressive practice re-calibration: "it's probably a matter of getting used to it".

3.1.3. Information and service understanding

This theme highlights the practical knowledge needs participants had when using or evaluating the SAV service. It includes confusion or uncertainty around how to start or end a ride, find the vehicle, or understand route logic and payment options. These insights reflect usability barriers that influence whether individuals feel capable of interacting with the system confidently, aligning with competence from SPT.

Even technologically positive users stumbled over procedural details. A common friction point was them discovering, only after boarding, that the passenger must start the trip in the app, otherwise the vehicle cannot depart. Others worried about finding the correct pick-up location "I hope I'm standing in the right place" or how to open the doors if or when no safety driver is present. These gaps reveal that competence extends beyond willingness; it requires clear, legible instructions embedded in both the software and the physical interface.

Several participants offered concrete suggestions: clearer in-app prompts, visible wayfinding at stops, and optional luggage carriers or ski-racks to make the SAV "work like a real taxi" for bulky errands. This underscores that for innovative mobility practices to become established, supportive material arrangements, such as clear digital and physical interfaces, are essential. Where information was flow perceived as good, such as the app showing the vehicle model and number, confidence rose. This illustrates how small design tweaks can smooth the integration of a novel mode into existing routines.

3.1.4. Synthesis

By framing acceptance as practice integration rather than as an isolated behavioral choice, we reveal the nuanced ways in which SAV adoption is influenced by intersecting layers of personal context and infrastructure. Across these sub-themes, everyday mobility contexts emerged as a critical gatekeeper for acceptance. The SAV was welcomed when it promised to fill gaps like missing feeder links, heavy-load trips, or steep walks to existing stops. Conversely, it was less well received when it duplicated well-functioning routes. Technology optimism led several informants to test the service, yet even the most enthusiastic users experienced some practical difficulties in their test rides. By viewing these findings through SPT, we see that adopting a SAV service is more than just a matter of attitude. Rather it can include a recomposition of meanings ("what kind of traveler am I?"), competences ("how do I start the ride?"), and materialities (topography, infrastructure, app design).

3.2. Utility

Utility emerged as a theme that captures how participants evaluate the usefulness and practicality of the SAV service. It spans aspects such as journey efficiency, functional benefits, and the design and accessibility of pick-up/drop-off points. Utility is not judged in isolation, but in relation to participants' daily routines, needs, and expectations for transport. Evaluations of utility were thus nested in their mobility contexts, highlighting the importance of alignment between technological capabilities and existing mobility practices.

3.2.1. Travel flow

Travel flow concerns how participants experience the journey in terms of control and predictability. Factors like reliability, route selection, app functionality, and travel time influence whether the service feels smooth and purposeful in everyday use. Several participants described at least one type of journey where the SAV felt faster or more direct than the conventional public transport options. R1 who needed to cross Groruddalen, an east–west trip poorly served by rail, said the vehicle "went straight across Groruddalen … it was very, very time-saving and practical".

However, flow was highly variable. One informant reported opening the app to find a car "20–40 min away" and ultimately cancelling the request due to the long estimated wait time. Waiting time estimates were described as "jumping from 20 to 10 to 5 and back to 20 min", making it impossible to plan ahead. This variability demonstrates how disruptions in anticipated travel flow quickly erode confidence, suggesting that reliability may matter even more than absolute speed in shaping user acceptance. Some respondents reported that they only used the service when they knew they had ample time, in order to deal with the inevitable delays involved. Technical glitches amplified the uncertainty: some trips were downgraded to manual driving when the automated mode failed, while others followed puzzling detours through housing estates or onto the motorway, adding 10–15 min compared with the rider's own mental map of the area. This alignment with local geographical knowledge illustrates a key dimension of competence; users must see the system as performing 'intuitively' according to their established travel expectations. Even if there is a good reason for doing different routes for the SAV, it seems that riders have an unmet information need about the factors that influence the route choice.

Importantly, several people felt the situation improved as the pilot progressed. One user who travels to evening training sessions noted that a car now "comes within five-six minutes" and that the service "is more reliable now than when I started [using it]". These accounts suggest that travel flow, and the implied utility, hinges on accurate real-time information and routing logic that aligns with local knowledge.

3.2.2. Practical value

Practical value captures the extent to which the SAV service is seen as feasible and useful in daily life. This includes considerations such as the space inside the vehicle, practical advantages, cost, and uncertainty about the actual utility of the service.

Price framed many judgements of value. While the pilot was free of charge, a suggested pilot fare of 100 NOK per trip was visible in the app. This was seen as "not that bad" given the time saved over a 45 NOK metro ride, Yet, several participants said they would only pay if the fare dropped to roughly 75 NOK. Charging per passenger was perceived as unfair: R10 "two people from Lindeberg to Grorud (…) would cost 200 NOK; Bolt would be cheaper" or comparing it to a taxi where everyone shares the cost. Respondents also expected pensioner or youth and child discounts. Others proposed monthly subscriptions that bundle SAV rides into the ordinary travel card. These suggestions reveal how perceptions of value are strongly influenced by users' existing reference points, such as public transport fares or competing on-demand services, underscoring the importance of clearly articulating the service's relative advantages and their chosen price point. One informant described the service as a potential "luxury service" that could be used when riders heavily favored convenience rather than economy. R12 was skeptical that users would continue seeing benefits of SAVs when they became a paid service:"I am curious about how usage will develop when people must pay for it [the service]. I am somewhat unsure that people will find it worthwhile".

Where the pricing felt acceptable, participants cited tangible benefits: time-saving on awkward cross-town trips, first/last-mile access to public transport exchanges or to recreational areas such as the local trailhead, and car-replacement potential for bulky errands – provided the vehicle (or a future variant) can "(R2) take a ski rack … or let me bring my shopping bags without sitting with them on my lap". Conversely, several users felt that shared rides could erode value if detours lengthened the trip: "Why pick up two others if I'm in a hurry? Then I might as well take the bus". This highlights a fundamental tension inherent in shared mobility models, where collective efficiency can sometimes be perceived as individual inconvenience, suggesting the need for transparent trade-offs communicated clearly to passengers. In sum, practical value is negotiated between speed, price and the degree to which the service matches specific life-situations like grocery runs, commuting, or leisure.

3.2.3. Pick-Up/Drop-Off (PUDO)

PUDO-points are one of the key components of users' interaction with the service. This theme reflects user experiences related to the location and design of PUDO-points. Participants expressed their needs, frustrations, and suggestions concerning accessibility, anonymity, physical layout, and possibilities for improvement. The location and clarity of PUDO-points repeatedly surfaced as the "make-or-break" factor for utility. Many participants walked 5–10 min at both ends of the trip:

R10: "The stop at Lindeberg is placed so awkwardly (…)I'd rather take the bus".

R5: "I still have to walk from the subway to the bus area and down again – it adds another 5–10 min".

Poorly labelled virtual stops caused additional confusion. One rider arrived early only to discover that the stop had been moved 50 m without notice, calling the app "really confusing". This confusion underscores that digital infrastructure is as crucial to user competence as physical infrastructure, pointing to the need for cohesive design across physical and digital platforms. Participants asked for more, and better distributed, stops inside large housing estates or near trailheads. Additionally, flexible "smart" placement that balances door-to-door convenience with network efficiency: "It can't drive into every cul-de-sac; you need smart stops, where several people get on and off". Participants' suggestions for 'smart hubs' reflect their implicit understanding that shared mobility requires new spatial configurations, echoing broader literature emphasizing the interplay between spatial planning and mobility innovation. They also frequently cited clearer in-app guidance, ideally links to Google Maps and suggesting other stops when a chosen point is unavailable.

When the stop layout meshed with everyday geography, for example, directly at a metro hub, participants called the service "a perfect location" and praised the seamless transfer. Hence, PUDO design is central to perceived utility, especially for travelers with limited mobility or heavy items.

3.2.4. Synthesis

The nuanced and situated nature of utility underscores that successful adoption of SAVs hinges on more than technical efficiency; it requires careful integration into the complex interplay of existing travel practices, expectations, and local geographies. Across interviews, utility was not a simple yes/no property but a situated judgement that fluctuated with wait-time accuracy, fare policy, and the micro-geography of stops. When these three ingredients aligned, the SAV was experienced as a time-saving, flexible mode that could replace multi-leg transit or occasional car trips. When they mis-aligned with long waits, high per-person fares, or distant pick-up points, riders defaulted to established options.

3.3. Trust

This theme examines how trust is built or undermined. It includes trust in the technology itself, the presence of safety measures and human operators, and the role of institutions like Ruter in ensuring reliability, transparency, and ethical responsibility. Analyzing trust through these layers highlights how trust formation in automated mobility extends beyond technical reliability, encompassing experiential, communicative, and institutional dimensions.

3.3.1. Safety driver and safety measures

This sub-theme captures participants' sense of security derived from the presence of a safety driver and other safety features. The human operator was seen as a reassuring factor, especially in unexpected situations. The operator acted as a source of interpretation of how the vehicle was performing. This real-time human interpretation illustrates the importance of human mediation in making unfamiliar technology legible and acceptable, aligning with research that stresses the role of humans as critical intermediaries in automation adoption. Visual tools like informational screens showing what the vehicle "sees" and physical safeguards like emergency buttons also contributed to a feeling of control and comfort during the ride. These symbolic signals represent crucial communicative elements that allow users to retain a sense of agency, further underscoring how symbolic and practical dimensions of safety intersect.

For virtually every participant the presence of a safety driver anchored the experience. Several riders said the journey felt “almost like a taxi”, precisely because of the “driver who could step in if something happened”. Observing the driver’s relaxed posture, hands hovering lightly while the wheel turned autonomously, conveyed both competence and vigilance. Even passengers who described themselves as “technology-curious” acknowledged that the driver’s quiet commentary “(…) now the vehicle is braking because it has detected a pedestrian”, reduced anxiety and transformed a novel technology into an intelligible service. Furthermore, many participants described situations in which the operator took manual control. This was not necessarily seen as dramatic, but more like a pre-caution. Some even remarked that the operators seemed to have too little trust in the vehicles’ ability. For those whose ride was completely manual, they remarked that this was very disappointing. One of the key reasons they gave for testing this service was to experience a novel self-driving service. Some even believed it may have given a wrong impression of the service:

R11: “I have reflected a bit on that, because there is a human [driver] there and it seems that he has his hands on the wheel, even though he is not driving. (…). Would these have been seated in the passenger seat, like driving instructors do, with the ability to intervene should anything happen, it may have been more realistic.”.

This suggests that, while the presence of an operator gave much reassurance, it was also seen as a sign of an unfinished product. This could in turn have impacted perceptions of the service as a more early-phase testing, rather than a mature soon-to-be-finished product.

Visual and physical safety measures amplified this effect. In-cabin screens that showed what the sensors “saw” reassured riders: “the car registers everything—cars, people, snowbanks”. Conversely, the perceived absence of an obvious emergency button or door release fueled unease. One commuter, R2, imagined feeling “locked in until the end-stop” and asked, “what if I need to get out, like, now?”. These accounts highlight that early acceptance rests as much on symbolic signals of control as on the underlying automation technology. This is likely of increased importance in the early phases before riders get acquainted with the technology and its’ capabilities. Several informants took it for granted that the interior and exterior of the vehicle would be under video supervision and that some remote dispatcher would be available if something undesirable was to happen:

R1: “If those vehicles have cameras on board, then that could become relevant, for example, in cases where police assistance is needed. Then it might even be that the police could gain access to the video feed from there in order to assess the situation.”

Several informants elaborated on situations in which they were unsure about how the vehicle would perform and how they, as paying riders, should act. Are they in any way liable for accidents the SAV gets into? Do they need to be a first responder if they witness accidents resulting in injury? They would also like a way to give feedback to the service operator about any occurrences during their ride and wanted this opportunity to extend to other road users that interact with the vehicle as well.

3.3.2. The digital driver and technological trust

The digital driver and the general trust in technology was central to all the respondents’ interviews. Views varied from high confidence to uncertainty, depending on perceived system maturity, testing procedures, and transparency. Trust was strengthened by understanding how the vehicle functions and seeing it behave predictably but weakened by lack of information or perceived limitations in the AI.

First-hand observations of the automated driving performance produced a spectrum of reactions, from enthusiasm, “(R4) the car drove like a competent, calm driver”, to lingering doubts from R2: “I still wish there were a brake pedal, you know? “Now it misread things, stop!” you know?”. Passengers were most impressed when the vehicle negotiated roundabouts smoothly, identified vulnerable road users, and recovered from snowy road conditions with minimal human intervention. These positive experiences not only reflect technical competence but also indicate how incremental exposure to reliable automated performance can progressively recalibrate travelers’ trust thresholds. Conversely, repeated hand-overs to the safety driver in winter conditions or detours dictated by conservative routing algorithms reminded riders that the technology isn’t fully developed yet.

Importantly, transparency mediated these judgements. When displays visualized sensor data or the driver verbally explained why an intervention was necessary, minor glitches were framed as “part of testing”. In the absence of such explanations, identical events were interpreted as technical insufficiency. This demonstrates that technological trust emerges not only from system reliability but from the interpretability and comprehensibility of system actions, resonating with literature emphasizing interpretability as key to user trust. Thus, technological trust was not solely a function of system reliability; it was co-produced through real-time communication that rendered the system’s decisions legible.

3.3.3. Organizational trust and responsibility

This sub-theme relates to trust in Ruter as the service provider, and in the broader system of governance, regulation, and ethical responsibility. Participants tended to express higher trust due to Ruter's public and transparent profile, contrasting with concerns they might have had with private actors. This trust included assumptions that the provider had tested thoroughly and prioritized public interest and safety.

An emerging idea was the idea that the service was “safe because it’s Ruter”. Participants portrayed the public transport authority as an organization with strong values, employing rigorous testing, and that they had something to lose if things go wrong. This institutional confidence extended to Norway’s regulatory regime: several interviewees said they trust the local regulation and assumed that a vehicle permitted on public roads probably must already meet higher safety standards than a private tech firm would impose on itself. One respondent also notes that being slightly late to the show may also have some benefits:

R6: «But the fact that we start later with testing here (…) suggests that we have more data as to what they have done right and wrong there [in earlier pilots elsewhere]”.

Others doing the heavy lifting by running early tests could benefit later tests. This reliance on institutional legitimacy and trust in the gradual improvement highlights how trust in automation depends significantly on governance structures and societal context, a critical yet often overlooked dimension in automation research.

By contrast, hypothetical scenarios involving global brands, “(R9) if it were Tesla running this” or a Chinese operator, provoked concern about data protection, accountability, and the pace of deployment. These contrasting views illustrate how trust is shaped by perceived alignment of institutional incentives with public welfare, pointing to the critical role that perceived organizational motives play in the acceptance of innovative mobility technologies. Riders argued that public ownership “keeps the collective interest in focus”, aligns with sustainability goals, and offers clearer redress if incidents occur. Organizational trust therefore acted as a system-level safety net: even when individuals were uncertain about the algorithm, they believed the provider would not deliberately expose them to undue risk.

3.3.4. Synthesis

Trust appeared to be built through multiple interacting layers: immediate safety cues (like the presence of a safety driver), technological transparency (such as visual displays or verbal explanations), and institutional credibility (trust in Ruter and Norwegian regulations). When participants described a smooth, well-explained, and safe experience, some imagined that future iterations of the service could function without a human operator. Conversely, when a safety feature was absent or a hand-over was unexplained, some expressed concern or hesitation. However, these concerns did not necessarily lead to a complete loss of trust, particularly when other reassuring elements were present.

These findings suggest that trust is dynamically negotiated during the trip, rather than statically assumed. While trust may evolve over time, our data indicated that specific experiences, such as a verbal explanation from the operator or a visible sensor screen, could shift passengers' perception of safety and control. We interpret this as trust being iteratively constructed, but also situationally reinforced in specific moments.

3.4. Social comfort

This theme addresses participants' emotional and social experiences of sharing space with others in the SAV. It explores tensions and benefits related to co-presence, the ambiguity of service norms, and the shifting boundaries between private and public transport. Social comfort emerges as a key factor in how participants assess the service's acceptability. Analyzing social comfort through this lens highlights the inherently social and symbolic dimensions of shared automated mobility, extending beyond individual preferences to include broader social norms and expectations. Most of the interviewees did not experience ridesharing at the time of the interview, other than with the operator. Only a very small number of participants reported direct experience with co-riding. Specifically, one participant shared a ride with another stranger, and one shared a ride with a significant other. As a result, most reflections on social comfort were based not on repeated lived experience of co-riding with strangers, but on expectations, interpretations of the service format, and imagined scenarios of sharing space with others. Nevertheless, they spoke vividly about what it would be like to share rides and what their expectations were.

3.4.1. Sharing-related Discomforts

This sub-theme captures the negative or uncomfortable aspects participants associate with sharing the SAV with others. It includes feelings of awkwardness, lack of control, group dynamics, concerns about safety or hygiene, and specific social vulnerabilities. Sharing was sometimes described as a burden by participants, especially when it involves proximity to unfamiliar people.

The most immediate frictions arose from the vehicle's size and seating layout. R1 was worried that "you sit in a very small room with someone you don't know—what if they come in with a weapon?". There were several mentions of how young women may feel exposed in a back-seat scenario that offered "no real distance if someone gets too pushy". However, none of the girls or young people in our sample made this assessment about their own situation. This highlights that there may be some distance between how people imagine events and what it is actually like to live those events. Or perhaps our limited sample simply failed to include individuals who are anxious about uncomfortable social situations. Young women among our respondents do not necessarily feel more exposed, however the mention of these groups may uncover that there is a general feeling of uneasiness about the sharing arrangements. This sense of vulnerability underscores how social comfort in shared automated vehicles is strongly mediated by perceptions of personal safety, reinforcing the necessity of explicitly addressing these concerns through design and communication strategies. Those who personally felt safe acknowledged that "some might find it uncomfortable; you're closer together than on a bus where there's more space". Design choices that improve social comfort for everyone will probably help reduce this general discomfort.

Proximity also triggered pandemic-era sensitivities. Sitting three-abreast with strangers was described by R8 as "a bit too close after COVID. (…) two window seats would be fine, but the middle seat is a stretch". Such pandemic-influenced sensitivities reveal how broader societal events continue to shape the meanings and practices associated with shared spaces, suggesting a fluid and historically situated nature of social comfort. Some discussed the necessity of social screens that could help separate riders, creating a physical barrier between them. However, this was also seen as quite undesirable, and some participants virtually shuddered at the thought of returning to COVID-like interventions.

Noise from the on-board computers and pumps, although primarily a technical issue, amplified the sense of confinement by making conversation harder and the cabin feel busier. These accounts show that discomfort was not simply a matter of personal anxiety; it was rooted in the embodied realities of limited space and uncertain social cues.

3.4.2. Ambiguity of the service format

Participants mentioned uncertainty about what kind of service the SAV represents: is it like a taxi, a bus, or something in between? This ambiguity highlights the critical importance of clearly communicated social scripts to establish appropriate interaction patterns, a key element of competence. This further affects social expectations, norms, and comfort. Design cues, naming, and communication influence how people interpret the "rules" of interaction and appropriate behavior.

A second strand of talk concerned what the service was supposed to be. Many riders said the experience "(R7) [feels] more like a taxi than public transport" because the vehicle looks like an ordinary passenger car. The app reinforced this impression by failing to signal clearly that other passengers might be picked up: "it's very subtle that this is a sharing service" and "I never expect someone else to get in". Such ambiguity left people unsure which behavioral norms to apply, taxi privacy or bus sociability, and therefore how much conversation, eye contact, or personal space to anticipate. Several participants argued that a larger "mini-bus–type vehicle" would instantly communicate a public transport-identity that may help alleviate this uneasiness:

R1: "At least I've never been in a taxi with strangers like that.

Hmm… and I could never have imagined doing that either. So I feel that at that point… the actual form factor of the self-driving… transportation…is really important, because it shapes my expectations about what kind of ride I'm going to have, who I'm going to be riding with, and what the context actually is.".

Participants' preference for explicit design signals indicates that effective social comfort strategies must integrate clear symbolic markers of intended use to shape user expectations. Others predicted that once the pilot was folded into the regular public-transport offer, expectations would realign: "when it becomes part of the network, I'll treat it like any other collective mode, not my private taxi". In practice, then, social comfort was tightly coupled to the symbolic framing of the service as much as to its physical design.

3.4.3. Perceived benefits of sharing

There were also moments where sharing was seen as positive, beneficial, or even enjoyable. Participants mentioned economic advantages, reduced social awkwardness compared to other public transport, and the potential for meaningful social encounters or relaxed co-presence.

Despite the reservations above, interviewees also saw positive potential for co-travel. Families imagined "(R1) sitting facing each other, maybe even eating together while the car does the driving", and extroverted riders welcomed "(R9) (…) the chance to chat with people. I meet strangers all the time; why not here too?". Such scenarios illustrate how shared mobility can potentially foster new positive social practices and routines, shifting traditional expectations of travel as purely functional toward a more socially enriching activity. Economic arguments also mattered: students and cost-conscious users were willing to trade extra stops for a lower fare, while business travelers valued the option to "(R5) pay a premium for exclusivity" when privacy was essential.

Importantly, positive experiences were not hypothetical. R3, who shared a ride with two Ruter staff members, described the encounter as "just pleasant—we started talking straight away". This positive interaction underscores that social comfort is not merely a passive state but can be actively constructed through situational interactions and social openness, offering potential pathways for enhancing user acceptance. Others suggested that clear in-app information about upcoming pick-ups would let them decide whether they were "in the mood to sit close to strangers" and thus avoid unpleasant surprises. These accounts illustrate that sharing can enhance rather than erode comfort when expectations and incentives are aligned.

3.4.4. Synthesis

Social comfort in the SAV is not a fixed attribute but a negotiated outcome of space, symbolism, and situational norms. The negotiation of social comfort thus emerges as inherently dynamic, shaped continuously by interactions between user expectations, spatial arrangements, and symbolic framings of the service. Discomfort surfaces when cramped interiors collide with taxi-like expectations of privacy; comfort grows when the service is framed transparently as collective, space allowances feel fair, and passengers can exercise a degree of choice. Designing for social ease therefore means more than adding centimeters of leg-room: it requires coherent signaling through vehicle form factor, pricing options, and digital communication so that riders know—before they board—what kind of social world they are entering. Ultimately, enhancing social comfort requires recognizing the vehicle as not just a technological innovation, but as a site of evolving social practices where users continuously negotiate new norms of mobility and social interaction.

4. Discussion

This section elaborates how our findings extend existing knowledge on shared automated vehicle (SAV) acceptance by synthesizing the user-centered SAVA framework of utility, trust, and social comfort with Social Practice Theory (SPT). Our guiding research question was how users experience and evaluate SAVs in one of the first qualitative investigations of SAVs fully incorporated into the public transport setting. Whereas survey-based studies typically isolate psychological determinants, our qualitative study reveals how those determinants are enacted within concrete routines, infrastructures and social meanings. These merged perspectives give novel insights into the early adopters of SAV service piloted in Oslo, Norway. Our analysis generated the themes everyday mobility contexts, trust, utility, and social comfort. These have been found previously to be foundational in SAV acceptance (Aasvik, Ulleberg, et al., 2025a). We add to the existing literature by populating the novel SAVA framework with in-depth analysis of test users' experiences and introducing a practice perspective to better contextualize these findings. Importantly, these layers extended beyond the immediate service encounter. Trust was also anchored in expectations about institutional responsibility, regulatory oversight, and data governance, suggesting that perceptions of safety and reliability are partly delegated to the systems that govern the technology rather than the technology alone.

4.1. Situating SAV acceptance research

Large-scale questionnaire studies have repeatedly identified utility and trust as primary predictors of AV usage intention (Aasvik, Ulleberg, et al., 2024; Chen et al., 2023; Nordhoff, Kyriakidis, et al., 2019). Recent analyses argue that these factors may even collapse into a single General Acceptance Factor (Aasvik, Ulleberg, et al., 2024; de Winter & Nordhoff, 2022). It has been postulated that this trend towards one factor could have been exacerbated because most respondents have never travelled in an AV. By only having vague or indirect experience with SAVs, people may have reduced nuance in their perceptions. The reduced exposure to the object survey respondents are tasked to evaluate may add noise to results by lending more heavily on conjecture and fleeting impressions based on headlines. By contrast, our interviewees had direct exposure to a SAV service integrated into the public transport setting in Oslo. Their accounts corroborate the importance of utility, trust, and social comfort. Furthermore, it also shows the ways in which perceptions grow more fine-grained once real experience accumulates. Some previous qualitative studies also have drawn on real test users, for example in shuttle pilots in Europe (Hilgarter & Granig, 2020; Nordhoff, de Winter, et al., 2019), and Australia (Booth et al., 2022). However, our study extends this line of work by examining a SAV service embedded in an existing public transport system and by explicitly grounding the analysis in the SAVA framework and Social Practice Theory, thereby moving beyond descriptive accounts to a theoretically integrated explanation of acceptance. These results add to the literature by explaining why acceptance factors often collapse into a single general factor in survey studies, namely because limited or hypothetical exposure masks the situational differentiation that emerges through real use.

First, perceived utility hinged less on speed or price than on situational fit. These findings corroborate earlier research using TAM and UTAUT, showing that usefulness and effort strongly influence willingness to adopt shared-mobility services. The findings also add detail on how such services fits with daily routines (Davis, 1986; Venkatesh et al., 2003). Designing SAV services that feel useful therefore means: 1) stabilizing real-time information and route information to deliver dependable travel flow, 2) offering pricing packages that is competitive and acknowledge potential downsides to shared rides, and 3) co-creating PUDO networks with local residents so that stops sit naturally within walking catchments and trip chains. This points toward a broader insight that designing effective automated mobility services must go beyond merely functional performance and actively engage with users' lived experiences, competences, and routines. Targeted improvements in these areas are likely to yield gains in perceived utility, which seems to be a prerequisite for broader acceptance and shifts to new transport modes. One participant tolerated a 100 NOK fare when the SAV bypassed an awkward cross-valley trip, yet dismissed the same fare as too high when a bus–metro chain ran reliably on time. Such reasoning suggests that the utility is not one unchanging entity but rather changes with everyday demands and possibilities. The novelty factor of an exciting new tech may also engender higher willingness to pay that wears off after a while. The evaluation of utility therefore fluctuated with timetable coordination, PUDO micro-geography and weather; variables rarely captured in stated-preference surveys. The routing choice of the SAV is also an example of the situated nature of this novel service. When the route chosen by the SAV deviated from respondents' mental map of a place they knew very well, respondents echoed that they did not understand why the vehicle chose the route that it did. This sparked concerns about efficiency of the service. Travel time and efficiency has consistently been found as key predictors of usage intentions and this concern may thus be a key for future service development (Hansen & Sener, 2023; Krueger et al., 2016).

Our conceptualization of utility is similar to the perceived usefulness from the technology acceptance model, but also includes elements of the perceived ease of use (Davis, 1986). The SAV could be adding great value to some travelers, but if it is hard to use (i.e. poor app or unavailable PUDOs), it remains a service with limited utility. The UTAUT similarly includes both effort expectancy and performance expectancy (Venkatesh et al., 2016). Our simplified framework includes both aspects and sees them more as two constituents of the greater factor. This can be exemplified by our sub-themes, which all include some supposed expectation about the utility gain of SAVs, but also qualms about the effort involved with utilizing it. Previous qualitative research about AVs have suggested that, although the current technology does not necessarily impress users, they remain optimistic about the future prospects of it (Nordhoff, de Winter, et al., 2019). This optimism was also captured by our utility-concept. Some respondents noted the different ways it may help them, like covering blind-spots in the public transport system or driving them to seasonally dependent locations like nature trails in summer or parking for ski trips during winter.

Second, trust was constituted in a multi-layered fashion. The presence of a safety driver echoed findings from shuttle pilots where human operators attenuate anxiety (Hilgarter & Granig, 2020). Our riders also enjoyed being able to see what the sensors of the vehicle were able to detect. Furthermore, institutional reputation helped respondents trust both Ruter as an operator and the Norwegian road authorities. Several respondents also noted the self-driving as comfortable and human-like. That triangulation supports the conceptualization of trust as composed of competence or ability, understandability or integrity, and benevolence or intention of developers (Körber, 2019). Our results also further enrich this understanding with qualitative texture on how the layers mutually compensate: a brief technical glitch was shrugged off if the driver explained it, but not if silence reigned. Likewise, the organizational trust was clearly dependent on an expressed world view where caution and testing was paramount, similar to what other research has found (Aasvik, Hagenzieker, et al., 2025). Another interview study also found trust, safety, and privacy concerns to be main drivers of SAV acceptance (Hou et al., 2025). Trust has not traditionally been included in the technology acceptance models, but may be of greater importance for SAV usage intentions (Aasvik, Ulleberg, et al., 2025a; Davis, 1986; Nordhoff, Kyriakidis, et al., 2019; Venkatesh et al., 2003). Importantly, these layers extended beyond the immediate service encounter. Trust was also anchored in expectations about institutional responsibility, regulatory oversight, and data governance, suggesting that perceptions of safety and reliability are partly delegated to the systems that govern the technology rather than the technology alone.

Third, social comfort emerged as an important consideration for our respondents. This evaluation seemed parallel to trust and utility. This resonates with evidence that discriminatory fears and privacy concerns depress ride-pooling uptake (Dolins, 2021; Moody et al., 2019). Our findings add nuance by revealing that ambiguity, whether the car is supposed to be private or shared, amplifies discomfort more than crowding alone. When the social script was unclear, pandemic-heightened sensitivities to proximity resurfaced. This has previously been noted in similar pilot tests (Aasvik, Hagenzieker, et al., 2024). Furthermore, there was a sense in which respondents prescribed discomfort for others. Young women were often described as recipients of this discomfort. However, the young women in our sample did not find themselves in an exposed situation – they rather trusted the safety mechanisms and good intentions of other people. This is similar to a classic risk perception gap, where one feels that others are more susceptible to risk than oneself (Weinstein, 1987). There is also empirically good reasons for suspecting young women to suffer more social unease on public transport, as this has been documented (Ison et al., 2024). Encountering socially uncomfortable situations may also be a larger problem in countries less equal than Norway, as they are world leading in gender equality (United Nations Development Program, 2023). Because the SAVs used in the current pilot intersects personal cars or taxis and public transport like buses, there seems to be room left for a new set of norms (Dolins et al., 2023). These norms will probably develop over time as these kinds of services see more use and help people navigate the novel social situation that arises in these ridesharing scenarios.

4.2. Linking SAVA to social practice theory

Social Practice Theory (SPT) conceptualizes practices as materiality (technologies, infrastructures, physical design), competence (know-how, systems understanding) and meaning (symbolic significance) (Shove et al., 2012). Mapping utility, trust, and social comfort onto these elements clarify how acceptance is enacted in our respondents' accounts. This gives depth to each of the SAVA factors by showing the ways in which they work to shape SAV perceptions.

Previous qualitative research on AVs have suggested that mobility is key to social life (Hilgarter & Granig, 2020). The usefulness of SAV services may be particularly salient in rural areas. In our study, travel-flow satisfaction rose when routing algorithms mirrored riders' tacit geographical knowledge and when PUDO stops matched the spatial environment of the surrounding housing. This links the negotiated understanding of utility with the concept of materiality. Conversely, misaligned stops broke the chain: travelers lugging grocery preferred a slower bus that stopped outside her building over an SAV that shaved eight minutes but required a hill climb. Price sensitivities likewise reflected household budgeting practices and existing fare benchmarks, in a synergy of meaning and materiality. Price in this context is not just a mental calculation of efficiency and utility, but also a socially situated judgment shaped by prior transport habits, perceived fairness, and the symbolic value of the service. This illustrates how economic evaluations are embedded in everyday practices and norms.

Safety drivers, emergency buttons and sensor displays are not merely technical add-ons; they are material props that enable passengers to perform trust by retaining a sense of intervention capability (competence) and by interpreting system intentions (meaning). When a driver verbally annotated the vehicle's decisions, users gained a shared narrative that reframed minor wobbles as learning moments rather than failures. Thus, trust is a practice of ongoing reassurance, co-produced by the humans involved. This testing is integral to the development of trust in the novel technology, and the safety driver helps put it in the right context. Designing for trust in this context therefore means orchestrating people, technology, and governance cues so that travelers can confidently relinquish control without feeling powerless. This shows that service design needs an integrated socio-technical approach. Trust in automation is shaped not just by technology, but also by social and institutional factors.

Whether a ride felt taxi-like or bus-like hinged on symbolic cues: text prompts, seating configuration, app icons. These tangible artefacts carry meanings that script expected behavior like engaging in silence or small talk. When cues conflicted, like when the car looked like a taxi but was supposed to be shared, users lacked a coherent script and interpreted close seating as intrusion. Enlarging the vehicle to mini-bus dimensions, or displaying clear pooling notifications, realigned meaning with materiality, enabling comfortable co-presence with strangers. Social comfort, then, is the successful negotiation of shared meanings in a novel mobility niche. The diagnosis of "sharing anxiety" in SAVs may be the result of this negotiation being unsuccessful (Dolins, 2021).

This mapping suggests that the SAVA elements are not independent constructs; they represent bundles of practice elements that must synchronize for acceptance to stabilize. Utility disintegrates if competence falters; social comfort collapses if material density contradicts privacy meanings; trust erodes if interpretability mechanisms fail. Ultimately, successful integration of SAVs into everyday mobility practices requires not just technical performance, but careful attention to how new practices intersect with existing competences, meanings, and material arrangements. The perceived fit between the SAV and people's everyday mobility practices ultimately determined its perceived relevance.

Our data indicates that each SAVA pillar manifests at multiple analytical levels. Utility operates at the micro level of trip chains (minutes saved), the meso level of household budgeting (monthly subscription requests) and the macro level of neighborhood spatial equity (stop distribution). Trust likewise spans individual sensor interpretability, interpersonal human mediation and institutional legitimacy. We therefore propose extending SAVA with an explicit level-of-analysis axis, akin to MAVA, to avoid conflating experiences that originate in different socio-technical strata. While this extra layer of analysis may not be appropriate in every context, it should be considered when one seeks to understand the mechanisms that influence SAV acceptance.

Beyond the practice-based interpretation of SAVA, our findings point to a broader institutional layer shaping acceptance. While trust, utility, and social comfort capture key experiential dimensions, participants also invoked assumptions about regulation, accountability, and data governance that extend beyond the immediate ride. Trust was not only grounded in vehicle behavior or the safety driver, but in the perceived legitimacy of the provider and regulatory framework. The public ownership of the service fostered confidence in safety standards and accountability, whereas hypothetical private or international actors raised concerns about data protection and responsibility. Participants also expressed uncertainty about liability, emergency response, and surveillance, indicating that SAVs are evaluated as part of a wider socio-technical system rather than as isolated technologies. Accessibility concerns further reinforced this perspective by linking acceptance to questions of inclusion and service design. Taken together, this suggests that acceptance is partly mediated by how risks, responsibilities, and benefits are governed, and that the SAVA dimensions are embedded within a broader governance context that shapes how users interpret and negotiate the service.

4.3. Practical implications for design and policy

Variable wait estimates triggered cancellations even among enthusiasts. Transport authorities should treat information accuracy as a core attribute because unreliability erodes both utility and trust. As pilots scale toward higher levels of automation, some form of human mediation may remain important during transitional phases. This could include contextual audio explanations or limited remote operator support in situations where the system encounters uncertainty. Rather than implying continuous human oversight, such interventions should be understood as occasional and situational, aligned with current SAE Level 3–4 deployments. These mechanisms can help maintain user trust by providing interpretability and reassurance without undermining the long-term goal of fully autonomous operation. Similar findings have been reported in simulator-based studies, where participants emphasized the importance of trusting that AVs behave similarly to human drivers, particularly in terms of speed regulation and responsiveness (Buckley et al., 2018). Sensor visualization displays proved powerful: simple, icon-based overlays increased perceived transparency without revealing proprietary data. Seating geometry, interior lighting and app language should converge on a coherent social script. If pooling is default, signal collectivism: slightly higher ceilings, forward-facing rows, and explicit “additional rider incoming” alerts. If on-demand exclusivity is marketed, reinforce privacy with booking options to lock the cabin for a surcharge. Residents spontaneously proposed “smart hubs” that condense demand and shorten walks. Municipal planners should co-create such hubs, ensuring wheelchair-friendly curbs and secure lighting to maintain social comfort after dark. These suggestions align with design principles of visibility, feedback, and affordance (Norman, 2013). When a system clearly signals its functions and responses, such as showing what the vehicle “sees” or guiding the user through intuitive app flows, users gain a stronger sense of control and understanding, which fosters both trust and usability. This highlights that good design must make things visible and reduce the cognitive effort required to understand how a system works. Inaccessible or ambiguous design increases the threshold for competent use, particularly among groups with impairments or low digital literacy.

Universal design and accessibility are dimensions that warrant further emphasis. Several participants indirectly pointed to barriers that may disproportionately affect people with reduced mobility, sensory impairments, or cognitive challenges, such as unclear pick-up locations, limited space for assistive devices, or complex app interactions. Similar trends have been found in qualitative research on SAV acceptance (Miller et al., 2022). Designing SAV services with accessibility in mind means ensuring intuitive vehicle entry and exit, clear visual and auditory information both in-app and onboard, and physical layouts that accommodate mobility aids. For example, curb-level boarding, tactile markers, voice prompts, and simplified interfaces can significantly improve usability for a wider range of users. Importantly, universal design does not only benefit disabled users; it also enhances usability for everyone. One of the great possibilities with SAVs is creating a more equal transport system. Highlighting this may also foster broader public acceptance (Martínez-Buelvas et al., 2025). Aiming to serve as an inclusive transport solution, embedding accessibility from the outset is both a social and operational imperative.

This study makes several contributions to the growing body of research on user experience with automated shuttle services. First, it provides rare qualitative insights into a shared service equipped with SAE Level 2 automated driving functions (Greifenstein, 2024). Qualitative enquiries yield richer and fuller analyses of early test users experiences than quantitative data can but are under-represented in the field. Second, by examining a service formally integrated into a public transport system, the study offers empirical evidence from a more realistic operational context than is typical of short-term, low-speed demonstration pilots (Aasvik, Hagenzieker, et al., 2024; Kutela et al., 2024; Nordhoff et al., 2020; Öztürker et al., 2024). Third, the findings show how sharedness and the co-presence of other passengers influence expectations, social norms and evaluations of the service. Fourth, the analytical approach combines the individual-level perspective of the SAVA model with concepts from Social Practice Theory, illustrating how user evaluations are embedded in broader mobility practices, expectations and competencies.

4.4. Limitations and future research directions

Our sample and study design precludes any statistical generalizability. Although our sample consisted of only 12 participants, this reflects the total number of early test users who were available and agreed to be contacted for research purposes during the pilot period. Despite our efforts, we were unable to recruit additional respondents. While this limits the breadth of perspectives, we argue that the sample still offers valuable and novel insight, given the rarity of real-world SAV user studies. The thematic analysis revealed rich and diverse experiences, and many themes recurred across interviews. However, we acknowledge that full thematic saturation may not have been achieved, particularly for less common perspectives. Future studies with larger and more varied samples are therefore needed to validate and expand on our findings.

Some interviews were conducted online a while after participants completed their test ride, raising recall concerns. Ethnographic-like ride-along studies could capture in situ emotional dynamics more accurately. Our analysis is also bound to the pilot that we gathered data from. Future pilots may generate somewhat different narratives.

While our study demonstrates novelty in the application of SAV technology, the system operated at SAE Level 2 automation during data collection. This relatively low level of automation, combined with the continuous presence of a safety driver, likely influenced participants' perceptions. These factors make the ride experience distinct from that of fully automated (Level 4–5) services without human presence. As higher automation levels become available, researchers should explicitly consider how perceptions vary depending on both automation capability and operator presence. Accordingly, our findings should not be generalized directly to higher automation contexts, although the underlying psychological and social mechanisms are likely to remain broadly relevant.

A further limitation concerns sample composition. Several participants expressed a relatively high interest in technology, which is common among early adopters of novel mobility services. This may introduce a bias toward more positive or curious evaluations of the SAV service, particularly in relation to trust in automation and willingness to experiment with new transport modes. As such, the findings may underrepresent perspectives from more skeptical or less technologically engaged user groups, who may place greater emphasis on risks, usability barriers, or social discomfort. This is particularly relevant for dimensions such as trust and social comfort, where prior attitudes toward technology may shape both expectations and interpretations of the experience. At the same time, the sample reflects the population that typically engages with early-stage pilot deployments. Understanding this group is valuable, as early adopters often play a key role in shaping initial acceptance trajectories and informing iterative service development. Future research should therefore aim to include more diverse user groups to assess how these findings translate across broader populations and stages of adoption.

A further limitation concerns the empirical basis for the analysis of social comfort. Although social comfort is central to the SAVA framework and emerged as an important theme in the interviews, most participants had limited direct experience with co-riding during the pilot. Only a small number of interviewees reported sharing the vehicle with another passenger, and many reflections on social comfort were therefore based on anticipated or imagined co-riding situations rather than repeated lived experience of sharing the vehicle with strangers. These anticipatory evaluations are still relevant for early-stage SAV deployments, as expectations about proximity, privacy, safety, and social norms may shape willingness to try or continue using shared services. However, the findings should be interpreted as capturing early expectations and perceived social scripts as much as actual interactional experiences. Future research should therefore examine social comfort in SAV services with higher levels of realized ride-pooling, using ride-along observations or post-ride interviews immediately after shared trips to capture how social comfort develops through direct co-presence with other passengers.

Future work should investigate how social scripts and novel norms may impact comfort and pooling willingness. Comparative studies across different cultures could test our proposition that organizational legitimacy buffers technical mistrust. Finally, interventions that ease the transition into this novel technology, like having the ability to supervise the driving algorithm, should be further developed.

5. Conclusion

This study offers novel, real-world insight into how early users experience and evaluate a shared automated vehicle service. By combining the SAVA model with Social Practice Theory, we show that trust, utility, and social comfort are not static traits but evolving elements of situated practices. Our findings emphasize that successful SAV adoption depends on more than technical performance. It requires alignment with users' routines, competencies, and social expectations. Trust is co-produced through vehicle behavior, users characteristics, and institutional legitimacy. Utility depends on the service's adaptability to complex travel needs. Social comfort hinges on design cues and normative clarity. Together, these insights highlight the importance of integrating socio-technical design with accessible, inclusive, and context-sensitive implementation strategies. As SAVs move from pilots to permanent services, such grounded understandings will be critical to fostering equitable and lasting modal shifts.

CRediT authorship contribution statement

Ole Aasvik: Writing – original draft, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Siri H. Berge:** . **Marjan Hagenzieker:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT (OpenAI) to improve the readability and clarity of certain sections of the manuscript, including suggestions for phrasing and language editing. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Interview Guide Original Norwegian.

I. Introduksjon – 5 min
   1) Informert samtykke, Fortell om bakgrunnen for intervju.
      - Dette intervjuet er del av PhD-prosjekt som finansieres av Norges forskningsråd. Skal se på aksept for selvkjørende kjøretøy. Ruter har langsiktige planer for teknologien og vi ønsker å kartlegge tidlig hvordan tjenesten fungerer. Slike tjenester er nesten ikke forsket på. Derfor gjennomfører vi intervjuer mest testbrukere. Dette intervjuet er anonymt, og ingen personopplysninger vil bli koblet til dine svar. Du kan trekke deg når som helst. Vi ønsker å høre dine personlige erfaringer og refleksjoner – det finnes ingen riktige eller gale svar.

II. Bakgrunn, fortell litt om deg selv – 10 min
   1) Fortell litt om deg selv
      - Boområde, Husholdning, Din typiske reisehverdag?
   2) Hvor fornøyd er du med din nåværende transportløsning?
   3) Interessert i ny tek, ADAS i bil?
   4) Hva tenker du om selvkjørende kjøretøy? Optimist eller pessimist?
      - (Waymo i California hvis relevant)
   5) Hvordan var din opplevelse med Ruters selvkjørende kjøretøy (SK)?
      - Fortell om testturen(e), positivt/negativt, informasjon fra Ruter, «Den digitale sjåføren»

III. SAVA-modell – 15 min
   1) Hva skal til for at du vil **bruke** tjenesten mer? Forbedringspotensiale?
   2) Hvordan er denne tjenesten **nyttig eller unyttig** for deg?
      - pris, reisetid, planlegging, fordeler/ulemper, enkel å bruke, redusere bilbruk, skapt flere reiser? tilgjengelighet, kunne SK forbedret transportmuligheter?
   3) Hva tenker du om det **sosiale** rundt å dele SK?
      - med fremmede, sitte tett, komfort, reise om kvelden, PUDO hjemme, gøy
      - Hvordan ville du sammenlignet dette med annen kollektivtransport som buss?
   4) Hva tenker du om å **stole** på SK?
      - forutsigbarhet, pålitelighet, trafikksikkerhet, sikkerhetsvert, organisasjonstillit – myndigheter, testing, hacking, sikkerhetsknapp/overvåkning, «Den digitale sjåføren»
      - «Hvorfor har du tillit/mistillit til SK?»

IV. Forbedring, hva er bra, konkrete ting – 10 min
   1) Utforming av kjøretøy, hva kunne vært endret? Hva er bra?
      - lys, musikk, setekonfigurasjon, plass i bilen, inn/ut av setet, interiør,
   2) Burde man hatt «sosiale kjøreregler»? Hvilke normer burde gjelde i SK?
      - «Delevettregler», ikke prat i telefon, ikke spise mat, ikke røyke, «Sosial skjerm»
   3) Digitale løsninger, god app?

- Informasjon om kjørerute, andre passasjerer, den digitale sjåføren

V. Avslutning – 5 min

1) Er det NOE du vil legge til før vi avslutter?

Tusen takk for at du tok deg tid til å svare på spørsmålene. Det har vært veldig nyttig for oss, og vi setter stor pris på ditt bidrag.

Interview Guide Translated.

I. Introduction – 5 min

Informed consent, explain the background of the interview.

- This interview is part of a PhD project funded by the Norwegian Research Council. The project investigates the acceptance of autonomous vehicles. Ruter has long-term plans for this technology, and we aim to assess how the service functions in its early stages. Very little research has been conducted on such services. Therefore, we are interviewing primarily test users. This interview is anonymous, and no personal data will be linked to your responses. You can withdraw at any time. We are interested in hearing about your personal experiences and reflections—there are no right or wrong answers.

II. Background, tell us a bit about yourself – 10 min

1. Tell us a little about yourself.
   - Residential area, household, your typical travel routine?
2. How satisfied are you with your current transportation solution?
3. Are you interested in new technology, such as ADAS in cars?
4. What are your thoughts on autonomous vehicles? Are you optimistic or pessimistic?
   - (Mention Waymo in California if relevant.)
5. How was your experience with Ruter's autonomous vehicle (AV)?
   - Describe your test ride(s), positive/negative aspects, information from Ruter, "The Digital Driver."

III. SAVA Model – 15 min

1. What would make you use the service more? Areas for improvement?
2. How is this service useful or not useful for you?
   - Price, travel time, planning, advantages/disadvantages, ease of use, reduction in car usage, has it created more trips? Accessibility, could AVs improve transport options?
3. What are your thoughts on the social aspect of sharing an AV?
   - Traveling with strangers, sitting close to others, comfort, traveling at night, pick-up/drop-off at home, fun factor.
   - How would you compare this to other public transport options, such as buses?
4. What do you think about trusting AVs?
   - Predictability, reliability, traffic safety, safety host, trust in organizations—authorities, testing, hacking, emergency button/monitoring, "The Digital Driver."
   - "Why do you trust/distrust AVs?"

IV. Improvements, what works well, concrete suggestions – 10 min

1. Vehicle design—what could be changed? What works well?
   - Lighting, music, seat configuration, space in the vehicle, ease of entry/exit, interior.
2. Should there be "social driving rules"? What norms should apply in AVs?
   - "Sharing etiquette," no phone calls, no eating, no smoking, "Social screen."
3. Digital solutions, is the app good?
   - Information about routes, other passengers, the digital driver.

V. Conclusion – 5 min

1. Is there anything you would like to add before we conclude?

Thank you for taking the time to answer these questions. Your insights have been very valuable to us, and we greatly appreciate your contribution.

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