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Planning for Autonomous Public Transport

Governance Conditions and Actor Perspectives in a Multi-Level Planning Context

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Abstract

This thesis examines how autonomous buses are interpreted and evaluated as a potential mobility solution within a multi-level planning context involving both municipal and regional perspectives. While autonomous vehicles are often framed as a key component of future sustainable transport systems, their implementation depends not only on technological development but also on social acceptance, institutional conditions, and governance structures. The study addresses this gap by analysing how different actor groups perceive the role, potential, and challenges of autonomous public transport.

The research is conducted as a mixed-method case study of a potential autonomous city-centre shuttle in Partille, Sweden. The empirical material consists of semi-structured interviews with institutional and professional actors, including municipal planners, regional public transport representatives, and a private-sector actor, complemented by a survey capturing broader public perceptions. The analysis is guided by an adapted version of the Unified Theory of Acceptance and Use of Technology (UTAUT), extended with perceived safety as an additional analytical dimension.

The findings show that autonomous public transport is generally understood as a complementary mobility solution, particularly suited to addressing first- and last-mile challenges and improving accessibility in fragmented urban environments. However, perceptions of its role differ between actor groups, reflecting distinct institutional logics related to efficiency, spatial integration, and cost efficiency.

A central conclusion is that implementation is fundamentally shaped by multi-level governance conditions rather than technological readiness alone. Large-scale deployment is unlikely to emerge from municipal initiatives in isolation and instead depends on coordination at the regional level, where actors such as Västtrafik play a key role. At the same time, municipalities can contribute through small-scale, locally embedded applications that function as socio-technical learning environments, supporting trust, familiarity, and market development.

The study further identifies regulatory uncertainty, long procurement cycles, and institutional rigidity as key barriers to implementation. However, the findings also suggest that the planning of autonomous transport does not fundamentally differ from conventional public transport in terms of route design and service provision. Rather than representing a radical break, autonomous vehicles can be understood as an incremental extension of existing systems.

Overall, the thesis highlights that the transition towards autonomous public transport is a gradual and multi-scalar process, requiring coordination across governance levels while recognising the complementary role of local initiatives in shaping long-term implementation conditions.

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1. Introduction

Autonomous vehicles (AVs) are increasingly positioned as a key component of future sustainable urban transport systems. Over the past decade, technological development has moved autonomous vehicles from experimental prototypes to real-world pilot implementations, and AVs are being tested in numerous cities and regions, both in Sweden and internationally (Iclodean et al., 2020; Anund et al., 2022). In some markets, such as the United States and China, AVs have moved from test projects to commercial implementation, primarily in the form of autonomous taxi and ride-hailing services (Axelsson, 2026).

Compared with private mobility services, autonomous public transport is associated with broader societal benefits, including improved accessibility, increased operational efficiency, reduced costs, and lower traffic congestion. Autonomous public transport is also highlighted as a more sustainable form of implementation, as its value depends on supporting shared mobility rather than individual car travel (Shen et al., 2023).

Social perceptions and acceptance are key conditions for the implementation of autonomous mobility. Previous studies show that trust, perceived safety, and familiarity with the technology influence acceptance. Research therefore emphasises gradual implementation, pilot projects, and test environments to build legitimacy and reduce uncertainty (Pigeon et al., 2021; Hadid et al., 2025). However, acceptance is shaped not only by individual attitudes, but also by institutional actors, local contexts, and governance arrangements.

Existing research on autonomous public transport has mainly focused on user attitudes or technical optimisation, often in large cities and metropolitan regions. However, less attention has been paid to how autonomous public transport is interpreted as a municipal planning issue in smaller urban contexts, where implementation depends on coordination between local planning, regional public transport systems, and public acceptance. This thesis therefore focuses on the smaller Swedish municipality of Partille and includes multi-actor perspectives from actors with different responsibilities and interests.

In Partille, new mobility solutions are closely tied to ongoing town-centre development. As part of its work on parking and mobility, the municipality has identified a need for alternatives to car-oriented transport to improve accessibility and promote sustainable travel. One potential solution is an autonomous city-centre shuttle aimed at improving internal accessibility (Partille kommun, 2023).

Against this background, this thesis explores autonomous buses and shuttles from the perspectives of different actor groups in an urban context. Through a case study of a potential autonomous city-centre shuttle in Partille, the study examines how social perceptions, perceived safety, and actor-specific interpretations shape the conditions for implementation within a multi-level planning context. It thereby reframes autonomous mobility not only as a technological innovation, but also as a governance and urban development challenge.

1.1 Aim and Research Questions

The aim of this thesis is to analyse how different actor groups interpret and evaluate autonomous buses within a municipal and regional planning context, and how these perspectives shape the perceived conditions for implementation. By focusing on social acceptance, perceived safety, and actor-specific perspectives, the study approaches autonomous public transport as a planning and governance issue rather than solely a technical innovation. Through a case study of a potential autonomous city-centre shuttle in Partille, it examines how social and institutional factors shape the implementation of autonomous mobility at the local level.

Research questions:

- How do different actor groups interpret the role and potential of autonomous buses in a multi-level planning context?
- What institutional, spatial, and social conditions are perceived to enable or constrain the implementation of autonomous buses?
- How do these perceptions differ between actor groups, and how do such differences shape implementation conditions?

1.2 Structure of the Thesis

The thesis follows a logical progression where chapter 1 introduces the research topic and presents the aim, research questions, and scope of the thesis. Chapter 2 provides the background and literature review, situating autonomous vehicles within existing research and planning contexts. Chapter 3 presents the theoretical framework and outlines the analytical dimensions guiding the study. Chapter 4 describes the methodological design, including data collection and analysis. Chapter 5 presents and analyses the empirical findings in relation to the research questions and theoretical framework. Finally, Chapter 6 discusses the findings and their implications for municipal planning and future research.

1.3 Delimitations and Scope

This thesis focuses on autonomous vehicles in the context of public transport. Privately owned autonomous vehicles, as well as commercially operated autonomous taxi and ride-hailing services, are therefore outside the scope of the study. The primary interest lies in how automation may be applied within collective mobility systems and municipal planning contexts.

Throughout the thesis, autonomous public transport is used as an overarching term and may also be referred to as autonomous buses or shuttles. While these concepts are related, distinctions are made where relevant. *Buses* generally refer to larger vehicles with higher passenger capacity, comparable to conventional public transport buses, whereas *shuttles* refer to smaller vehicles with lower capacity, often intended for shorter routes or feeder services.

The empirical focus is Sweden, with particular attention to western Sweden. In this context, the regional level mainly Västra Götalandsregionen, which is the regional public transport authority in Västra Götaland and owns Västtrafik, which plans and procures public transport on behalf of the region. However, the institutional arrangements discussed are broadly comparable to those found in other Swedish regions.

The study examines perceived conditions for near- to medium-term implementation based on currently available technologies and ongoing policy developments, rather than fully autonomous future scenarios. Furthermore, it captures perceptions at a specific point in time, in a context characterised by ongoing technological development and regulatory uncertainty. The study does not assess technical vehicle performance, engineering solutions, or economic feasibility in detail. Instead, the focus is on social perceptions, actor perspectives, and the planning and governance conditions shaping implementation.

While centred on Partille municipality, the findings aim to provide analytical insights that may be transferable to other municipalities facing similar mobility and governance challenges, rather than being directly generalisable.

The study focuses on selected actor groups considered relevant to the planning and implementation context, including public sector actors, regional authorities, and an actor from the private sector. It does not aim to represent all possible perspectives. Rather, the purpose is to provide an in-depth understanding of how different actors interpret and evaluate autonomous public transport within a specific planning context.

2. Background and Literature Review

This chapter situates the study within existing research on autonomous vehicles, with particular focus on autonomous buses and shuttles. It outlines key developments in the field, including pilot projects and demonstration initiatives, and discusses the main opportunities and challenges associated with implementation. By reviewing current research and planning debates, the chapter provides the contextual foundation for analysing a potential autonomous city-centre shuttle in Partille. It concludes with a brief presentation of the municipality and its strategic interest in alternative mobility solutions.

2.1 Autonomous Buses and Shuttles

Autonomous buses and shuttles represent a specific application of automated vehicle technology within public transport systems, often positioned as flexible and locally adaptable mobility solutions. In contrast to autonomous cars, autonomous shuttles and buses are typically designed to operate at low speeds, follow predefined routes, and serve short-distance trips, often in urban centres, campuses, business districts, or areas with limited accessibility. Previous research highlights that such systems are frequently introduced as complements rather than replacements to existing public transport, aiming to improve first- and last-mile connectivity and enhance overall accessibility (Bucchiarone et al., 2021; Hadid et al., 2025; Anund et al., 2022). This complementary role situates autonomous shuttles within existing transport networks rather than as disruptive replacements, making integration and coordination central planning concerns.

Technological development in this field has progressed rapidly over the last decade. Autonomous shuttle systems typically rely on sensor-based technologies and pre-mapped environments to navigate urban space. While the level of automation remains limited compared to fully autonomous vehicles operating in mixed traffic, current systems have demonstrated the technical feasibility of driverless operation in controlled or semi-controlled environments (Iclodean et al., 2020). As a result, autonomous shuttles are viewed as a realistic near-term application of vehicle automation within public transport, particularly in controlled or semi-controlled urban settings (Tian et al., 2022). Furthermore, if automation increases the efficiency of public transport, AVs could contribute to more favourable urbanisation patterns (Soteropoulos et al., 2019).

At the same time, previous studies suggest that autonomous buses should not be understood solely as a technological innovation. Instead, they constitute a socio-technical system, where technological solutions and social arrangements co-evolve and influence each other, including infrastructure design, governance structures, user behaviour, and public expectations (Bucchiarone et al., 2021; Tian et al., 2022). The introduction of autonomous public transport involves not only technological considerations, but also broader system-level and organisational factors. This makes their introduction particularly relevant for local authorities, as implementation depends not only on technological performance but on regulatory frameworks, spatial design, institutional coordination, and public trust.

2.2 Pilot Projects and Real-World Examples

To date, most AV initiatives within public transport have taken the form of pilot projects or real-world test environments, reflecting the experimental and uncertain nature of the technology (Mouratidis & Cobeña Serrano, 2021). These projects serve multiple purposes, including testing technical performance, addressing operational challenges, and evaluating user experiences and public acceptance. In Sweden and other European countries, autonomous shuttles have been deployed in a variety of settings, including university areas, city centres, and transport hubs (Anund et al., 2022; Hansson, 2020).

Research based on these pilot initiatives indicates that real-world test environments are crucial for building practical knowledge and institutional learning. Demonstration sites generate knowledge not only about vehicle performance, but also about organisational responsibilities, stakeholder coordination, and communication with the public (Anund et al., 2022). This shows that implementation challenges are organisational and regulatory as much as technical, making governance and institutional capacity central to the process. Pilot projects also function as important contexts for understanding how autonomous mobility operates within existing transport systems and institutional frameworks.

Studies further suggest that pilot projects play a role in shaping public perceptions of autonomous buses. Exposure to real-world operations has been shown to influence how users perceive aspects such as safety, reliability, and usefulness, even when large-scale implementation remains uncertain (Shen et al., 2023; Mouratidis & Cobeña Serrano, 2021). As a result, pilot projects are often described as a step in a gradual implementation process, where testing and demonstration contribute to increased familiarity and acceptance over time. The introduction of autonomous bus services is unlikely to occur as a one-off replacement, but rather through gradual and staged deployment processes. Low initial levels of public acceptance mean that full-scale implementation may be neither feasible nor desirable in early stages, reinforcing the importance of pilot environments and incremental introduction strategies (Tian et al., 2022).

Research further highlights that pilot projects also reveal limitations and challenges. Many initiatives operate in controlled or semi-controlled environments, which may differ significantly from more complex urban settings. This suggests that findings from pilot projects are context-dependent and may not be directly transferable to large-scale deployment (Anund et al., 2022; Mouratidis & Cobeña Serrano, 2021). In addition, pilot projects are often dependent on temporary regulatory permissions and specific institutional arrangements, indicating that broader implementation requires alignment between technological development, regulatory frameworks, and organisational capacity (Anund et al., 2022).

Overall, existing research presents pilot projects as an important part of the development and introduction of autonomous public transport, providing empirical insights into both opportunities and constraints. At the same time, the literature indicates that pilot environments represent specific

conditions, and that further understanding is needed regarding how such insights translate into long-term implementation within different planning contexts.

2.3 Regulatory and Policy Frameworks

The regulatory framework plays a central role in shaping the conditions for implementing autonomous vehicles in public transport systems (Hadid et al., 2025). As autonomous mobility introduces new forms of responsibility, safety considerations, and operational arrangements, its deployment depends on legal structures, testing permissions, and institutional governance at multiple levels.

Several countries and cities have already begun adapting regulatory frameworks to enable autonomous mobility services. For example, countries such as France and Luxembourg have introduced national-level regulations allowing pilot operations and gradual integration of autonomous shared mobility services into public transport systems. These regulatory initiatives aim to create legal clarity regarding issues such as liability, operational safety, and responsibilities between public authorities and technology providers (Drive Sweden, 2026). Current regulatory frameworks in Sweden remain largely limited to testing environments, with a lack of clear legal structures for full-scale deployment, which may delay implementation. Recent Swedish analyses also describe the current situation as a fragmented “wait-and-see” condition, where public actors await clearer political direction while market actors await clearer national signals before committing to larger investments (Axelsson, 2026).

In Sweden, the Swedish Transport Agency (Transportstyrelsen) holds a central role in regulating testing and deployment of autonomous vehicles. A central initiative in this work is the so-called *Transformationskartan*, a national strategic roadmap coordinated within the Drive Sweden programme, which highlights several expected societal benefits of automated mobility (Axelsson, 2026). These include improved traffic safety, increased accessibility, reduced operational costs, climate benefits, solutions to driver shortages, and contributions to more attractive urban environments. The roadmap outlines steps toward integrating automated mobility into the Swedish transport system and identifies key milestones related to regulation, infrastructure, and institutional coordination. According to this initiative, the ambition is for automated vehicles to become an integrated part of the Swedish transport system by 2030, while national preconditions for larger-scale deployment are expected to be clarified by 2027 (Axelsson, 2026).

Recent analyses of a future Swedish regulatory model emphasise that EU-level vehicle regulations alone are insufficient to enable implementation in practice. While type-approval frameworks regulate how vehicles are designed and approved “before entering the road”, additional national rules are required to govern how automated vehicles are actually used in traffic, including questions of liability, operation, and supervision. A key barrier identified in the Swedish context is therefore the lack of clear national rules regarding responsibility and use, which creates uncertainty among both public authorities and private actors and may delay market introduction (Axelsson, 2026; Lundahl et al., 2026).

The roadmap emphasises that regulatory development cannot be understood in isolation, but as part of a broader system of interdependent conditions, including infrastructure, business models, organisational responsibilities, and cross-actor coordination. A key challenge concerns the distribution of responsibilities between actors, including national authorities, municipalities, operators, and technology providers. Unclear governance structures are identified as a major barrier to implementation (Drive Sweden, 2026). In this regard, Swedish policy discussions increasingly point toward a shift in responsibility from individual drivers to system-level and organisational actors, reflecting the fact that the automated driving system performs the dynamic driving task rather than a human driver (Axelsson, 2026; Lundahl et al., 2026).

Furthermore, the development of a regulatory framework is described as a gradual and adaptive process. Rather than introducing a fully comprehensive system at once, Swedish policy discussions highlight the importance of stepwise regulatory development, where experimentation and pilot projects function as an intermediate stage between testing and full-scale deployment. The existing experimental regulation is therefore seen as an important transitional tool, enabling learning and adjustment before broader implementation is realised (Lundahl et al., 2026).

These developments illustrate that the implementation of autonomous public transport is fundamentally a governance challenge as much as a technological one. While pilot projects are increasingly enabled through existing regulatory frameworks, scaling up automated mobility services into regular public transport systems remains dependent on clearer regulation, defined responsibilities, and stronger institutional coordination. In a municipal planning context, this means that local initiatives such as potential autonomous shuttle services are fundamentally shaped by national regulatory developments and policy directions.

2.4 Opportunities, Challenges, and Relevance for Municipal Planning

The potential benefits of autonomous buses highlighted in previous studies include improved accessibility, increased flexibility in service provision, and possible long-term reductions in operating costs through the removal of a driver (Azad et al., 2019; Hadid et al., 2025). Furthermore, autonomous buses and shuttles are often framed as a tool for supporting sustainable mobility goals by offering alternatives to car-oriented transport, particularly in urban areas where space and environmental considerations are central. Additionally, some studies suggest that traffic congestion may be reduced by eliminating human driving errors and inefficiencies (Iclodean et al., 2020). Recent Swedish policy analysis similarly argues that automated mobility may contribute to broader societal goals such as improved traffic safety, increased accessibility, reduced driver shortages, more efficient use of urban space, and strengthened public transport provision, provided that the services are properly integrated into the wider transport system (Axelsson, 2026).

Simultaneously, research emphasises several challenges associated with implementation. Technical limitations, such as difficulties in handling complex traffic situations and adverse weather conditions, remain an issue in many projects (Iclodean et al., 2020). Regulatory uncertainty, questions of liability, and unclear responsibility between public and private actors also pose barriers to broader deployment (Hansson, 2020; Anund et al., 2022). In addition, studies note that acceptance of autonomous buses varies between groups and contexts, and that concerns related to safety, trust, and reliability are common, particularly in early stages of implementation (Pigeon et al., 2021; Shen et al., 2023).

Recent technical research further highlights the complexity of autonomous driving in pedestrian-dense urban environments, where autonomous systems must continuously interpret uncertain and dynamic pedestrian behaviour in real time (Moller et al., 2026). Highly crowded urban settings remain particularly challenging due to unpredictable interactions, shared spaces, and the need to balance safety with efficient vehicle behaviour. At the same time, the implementation of autonomous mobility is not solely a technical challenge. Due to the high costs associated with AV technology, large-scale deployment is expected to emerge primarily through shared mobility platforms rather than private ownership (Freund et al., 2024). This implies that autonomous mobility systems will depend on coordination between multiple actors, including platform operators, transport providers, municipalities, and technology suppliers. In the Swedish context, public transport procurement models are often characterised by long contract periods and organisational structures built around conventional driver-operated services, which may reduce flexibility for introducing innovative and more dynamic mobility solutions (Axelsson, 2026). These challenges illustrate that implementation depends not only on technological maturity but also on institutional clarity, governance capacity, and public trust.

Autonomous shuttles are increasingly framed as a solution to first- and last-mile challenges, which represent persistent weaknesses in public transport systems where fixed-route services struggle to serve short, dispersed trips between hubs and final destinations. Research suggests that autonomous shuttles can function as flexible feeder services requiring limited additional infrastructure, complementing existing public transport by strengthening multimodal travel chains and improving proximity mobility in areas such as city centres, campuses, residential districts, and service nodes. Demonstration projects further show that this feeder role is a central use case, particularly in near-urban contexts, though successful implementation depends on integration with existing traffic environments and attention to reliability, accessibility, and user experience (Bucchiarone et al., 2021; Hadid et al., 2025; Anund et al., 2022). However, while such functional roles are frequently highlighted, less attention has been paid to how these proposed benefits are perceived by local actors who would be involved in or affected by implementation at a municipal level.

From a municipal planning perspective, these opportunities and challenges are linked with local planning goals, governance structures, and policy priorities. In Sweden, municipalities hold primary

responsibility for land-use planning, traffic management, and the coordination of local mobility solutions, placing them in a central position in decisions about whether and how to introduce autonomous shuttles. In city-centre contexts, such systems are often discussed to enhance accessibility while reducing dependence on private cars, especially in areas undergoing urban development or transformation (Hadid et al., 2025). Municipalities also play a central role through local traffic management, urban design, and the integration of autonomous mobility into broader planning objectives (Axelsson, 2026).

Overall, the literature presents autonomous public transport as a technology with significant potential, while also emphasising that its implementation is associated with multiple uncertainties and context-dependent outcomes. Existing research therefore suggests that the realisation of such systems depends not only on technological development, but also on how they are integrated into existing transport systems and planning contexts.

2.5 Partille as a Case Study

Partille municipality is located adjacent to Gothenburg and represents a relevant context for examining the potential implementation of autonomous public transport in a smaller urban setting. As a commuter municipality with strong connections to the Gothenburg region, Partille is characterised by a combination of local mobility needs and dependence on regional transport systems. This creates specific challenges related to accessibility, connectivity, and the integration of local and regional travel flows.

The municipal centre of Partille is currently undergoing development, with ongoing projects aimed at strengthening the attractiveness, functionality, and accessibility of the central area. This includes the development of new residential areas, public facilities, and activity nodes, as well as efforts to improve walking, cycling, and public transport infrastructure. In this context, mobility is a key planning issue, particularly regarding how different parts of the centre can be better connected and how reliance on private car use can be reduced (Partille kommun, 2023).

A specific characteristic of the Partille centre is its relatively linear and spatially dispersed structure, where key destinations such as Partille Centrum, Partille Port, and surrounding areas are located within a limited distance but are not fully integrated in terms of movement and accessibility. This creates potential challenges for internal connectivity, particularly for short-distance trips within the centre.

Within this framework, accessibility is addressed not only through physical parking supply, but through a broader package of mobility measures, including improved walking and cycling infrastructure, mobility hubs, shared mobility services, and a proposed city-centre shuttle (Partille kommun, 2023). The shuttle is thus framed as one potential element within a coordinated mobility strategy aimed at improving internal accessibility in the centre while supporting sustainable travel patterns. In this context, the shuttle is not presented as a stand-alone technological innovation, but as a component within a

broader restructuring of local mobility systems. The municipality's interest in alternative mobility solutions is also connected to ongoing planning processes and efforts to balance accessibility with sustainable transport goals (Partille kommun, 2023). This broader background underscores why Partille constitutes a relevant case for examining how autonomous mobility solutions are interpreted and negotiated within municipal planning practice.

The interest in such a solution should therefore be understood as embedded within broader municipal planning processes rather than as a purely technological initiative. Autonomous buses enter the discussion as one possible planning tool for addressing challenges related to urban development, accessibility, and sustainable transport, embedded within existing governance structures and strategic mobility planning. Taken together, this makes Partille a relevant case for examining how the opportunities and challenges identified in the literature are interpreted and negotiated within a specific municipal planning context.

3. Theoretical Framework

This thesis employs the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), as its primary analytical framework. Although originally formulated to explain individual acceptance of information technologies (IT), UTAUT is here adapted to analyse how different actor groups interpret, evaluate, and condition autonomous public transport within a municipal planning context. The chapter positions UTAUT in relation to alternative technology acceptance theories, outlines its core constructs, and explains how the framework is analytically applied in this study. By extending UTAUT beyond individual user intention to a multi-actor planning context, the framework enables acceptance to be understood as relational and institutionally embedded rather than purely psychological.

3.1 Technology Acceptance Theories and Justification of UTAUT

The acceptance of new technologies has been studied using several theoretical frameworks originating primarily from psychology, information systems, and innovation research. These frameworks offer different perspectives on how individuals and organisations perceive, evaluate, and adopt emerging technologies. In the context of autonomous buses and shuttle services, previous research has applied models such as the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), trust-based models, and task–technology fit (TTF) theory, alongside UTAUT (Cai et al., 2023). Studies applying TAM and TPB to autonomous shuttle services have highlighted the importance of perceived usefulness, behavioural control, social norms, and trust in shaping intentions to use autonomous mobility systems (Moták et al., 2017; Chen, 2019). For example, Chen (2019) applies an extended TAM framework to analyse factors influencing the intention to use autonomous shuttle services, highlighting the importance of perceived usefulness, trust, and attitudes towards autonomous mobility.

Early models such as TAM and TPB primarily explain technology acceptance by focusing on individual level perceptions and behavioural intentions (Moták et al., 2017; Venkatesh et al., 2016). Studies applying these frameworks to autonomous shuttle services similarly tend to focus on individual perceptions of usefulness, trust, enjoyment, and intention to use (Chen, 2019). While these models provide valuable insights, their emphasis on individual cognitive evaluations limits their capacity to account for institutional, organisational, and governance-related factors shaping implementation (Moták et al., 2017). To address these limitations, UTAUT was developed as a synthesis of several earlier models, integrating their key constructs into a unified framework for explaining technology acceptance (Venkatesh et al., 2003; Venkatesh et al., 2016).

UTAUT identifies four core determinants influencing acceptance: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). Unlike earlier models, UTAUT explicitly incorporates both individual perceptions and contextual factors, including social influence and institutional support. This broader scope enables acceptance to be understood not only as an individual evaluation of usefulness and ease of use, but also as shaped by contextual conditions such

as infrastructure, governance arrangements, and institutional capacity (Cai et al., 2023; Venkatesh et al., 2003).

UTAUT has been widely applied in studies of autonomous vehicles and automated public transport, demonstrating its relevance for analysing acceptance of emerging mobility technologies (Venkatesh et al., 2012; Venkatesh et al., 2016; Bellet & Banet, 2023; Cai et al., 2023). Although the model was originally developed to predict individual behavioural intention, later research has emphasised its flexibility and applicability across different actors and contexts, including organisational and institutional settings (Venkatesh et al., 2016). This makes UTAUT particularly suitable for this study, which moves beyond individual user intention to examine how acceptance is constructed and negotiated among multiple actor groups within a municipal planning context. In this sense, UTAUT is not employed as a predictive behavioural model, but as a flexible analytical framework for examining how acceptance is shaped within institutional and governance settings.

3.2 The UTAUT Framework

UTAUT conceptualises technology acceptance as shaped by four core determinants: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). Performance expectancy refers to the degree to which a technology is perceived as beneficial or useful, for example by improving accessibility, efficiency, or effectiveness. Effort expectancy concerns the perceived ease or difficulty of understanding and using the technology. Social influence captures the extent to which important others, such as peers, authorities, or institutions, are perceived to support or oppose the technology. Facilitating conditions refer to the perceived availability of organisational, technical, and institutional support structures that enable implementation and use.

Although originally developed in the context of information technologies, the constructs are deliberately formulated at a general level, allowing them to be applied across different technological and organisational contexts (Venkatesh et al., 2003). This adaptability has supported the application of UTAUT in research on emerging technologies, including automated transport systems (Venkatesh et al., 2012; Venkatesh et al., 2016; Bellet & Banet, 2023).

In the context of autonomous public transport, these constructs provide a structured way of analysing how different actors assess expected benefits, perceived complexity, social legitimacy, and institutional readiness. Rather than focusing solely on individual behavioural intention, the framework enables attention to how acceptance is embedded within broader governance and planning contexts.

3.3 Perceived Safety and Actor Perspectives

Perceived safety is widely recognised as a central factor influencing acceptance of autonomous vehicles and public transport automation. Previous studies identify safety, reliability, and trust as key determinants shaping public attitudes toward autonomous transport, particularly in complex urban

environments (Pigeon et al., 2021; Shen et al., 2023). Empirical research further demonstrates that trust in autonomous systems is not only associated with general attitudes but directly influences both behavioural intentions and expectations of system performance. For instance, Marsja et al. (2025) demonstrate that trust in automated shuttle buses significantly predicts both the intention to use them and expectations regarding their ability to behave safely, such as braking appropriately in interactions with pedestrians and cyclists. This highlights that perceived safety is not an isolated factor but closely intertwined with how users anticipate and evaluate system behaviour.

Although safety is not explicitly defined as a core determinant within UTAUT, it is closely related to several of its constructs. Perceived safety shapes performance expectancy by influencing whether the technology is considered beneficial and reliable in practice. At the same time, it relates to facilitating conditions, as perceptions of safety are closely tied to trust in institutional capacity, regulatory frameworks, and system governance (Venkatesh et al., 2003). Safety operates as a cross-cutting dimension, influencing both how the technology is evaluated and how its implementation context is perceived.

In the context of autonomous public transport, perceived safety should therefore be understood not only as an individual perception, but as a broader planning and governance issue. Trust in automated systems is shaped by factors such as predictability, transparency, and the ability to form clear expectations of system behaviour (Marsja et al., 2025). From this perspective, safety is closely linked to how the technology is communicated, experienced, and embedded within everyday mobility environments. In urban contexts where autonomous vehicles interact with pedestrians and cyclists, safety perceptions are further influenced by shared space dynamics and uncertainty in human-machine interaction (Moller et al., 2026). Previous research further suggests that barriers to autonomous vehicle adoption are often psychological and social rather than purely technological. Trust, perceived safety, uncertainty, and perceived adoption difficulty have been identified as central factors shaping resistance towards autonomous mobility (McLeay et al., 2025). Concerns related to safety and uncertainty may create forms of “technostress”, leading to reduced trust and increasing resistance towards autonomous vehicle adoption. This study therefore incorporates perceived safety as an additional analytical dimension alongside the original UTAUT constructs.

Domain-specific extensions of UTAUT, such as UTAUT4-AV, highlight the importance of safety, trust, and mobility context in shaping acceptance of automated vehicles (Bellet & Banet, 2023). These extensions emphasise that acceptance is shaped not only by technical characteristics, but also by how technologies relate to users’ existing mobility conditions and travel needs. Rather than adopting UTAUT4-AV directly, this study draws on these developments to support a planning-oriented interpretation of UTAUT. In a municipal planning context, actors evaluate autonomous buses not only in terms of individual usability, but in relation to existing mobility systems, governance arrangements,

and local transport challenges. Perceived safety, in this sense, becomes a relational and institutional issue, shaped by how responsibility, control, and risk are distributed across actors.

Acceptance is therefore conceptualised as a contextual and socially embedded process, where perceived safety plays a central role in mediating trust between users, technology, and institutions. This implies that the successful implementation of autonomous public transport depends not only on achieving high levels of technical safety, but on aligning technological performance with social expectations, institutional credibility, and everyday experiences of security.

3.4 Analytical Application in This Study

In this study, UTAUT is employed not as a predictive behavioural model, but as a flexible analytical framework for interpreting qualitative empirical material. The focus is not on measuring behavioural intention or actual use, but on exploring how different actor groups understand, value, and condition autonomous public transport as a potential planning intervention.

This analytical use of UTAUT is consistent with later developments in technology acceptance research. In their synthesis of more than a decade of UTAUT-based studies, Venkatesh et al. (2016) argue that acceptance should be understood as a dynamic and context-dependent process shaped by organisational, institutional, and societal factors.

The four core determinants of UTAUT (performance expectancy, effort expectancy, social influence, and facilitating conditions) are therefore interpreted in relation to planning and governance contexts rather than individual user intention. In addition, perceived safety is incorporated as a fifth analytical dimension, reflecting its empirical prominence in research on autonomous mobility. These dimensions structure the analysis across different actor groups, allowing acceptance to be examined as a relational and context-dependent planning issue rather than an individual psychological variable.

By applying UTAUT as an analytical lens to the empirical material, the framework enables a structured comparison of how residents, professional actors, and local businesses assess expected benefits, perceived complexity, social legitimacy, institutional readiness, and safety concerns related to a potential autonomous city-centre shuttle. In a municipal context, facilitating conditions are understood not only in technical terms, but also as planning capacity, governance arrangements, legal responsibility, and physical urban form. This interpretation aligns with previous research highlighting the importance of institutional readiness and governance in the implementation of autonomous public transport systems (Anund et al., 2022; Hadid et al., 2025). Each dimension is operationalised through thematic interpretation of the interview and survey material, allowing actor-specific perceptions to be compared across these analytical categories. The analytical application of the adapted UTAUT framework is summarised in Table 1.

Table 1. UTAUT application in the study

Dimension	Original meaning in UTAUT	Application in this study
Performance expectancy	Perceived usefulness	Expected benefits of autonomous transport
Effort expectancy	Ease of use	Knowledge, familiarity, behavioural adaptation
Social influence	Influence from others	Institutional legitimacy and public attitudes
Facilitating conditions	Organisational/technical support	Governance, regulations, procurement, infrastructure
Perceived safety	Extension beyond original model	Trust, safety perceptions, predictability

4. Methods

This study is designed as a mixed-method case study examining how autonomous public transport is interpreted and evaluated within a municipal planning context. Given the study's focus on both institutional implementation conditions and public perceptions, a mixed-method approach is adopted to capture complementary dimensions of the phenomenon. The combination of interviews and a survey allow the study to link governance perspectives with everyday user perceptions, which is central to understanding planning feasibility. A case study approach is suitable for this study because it examines complex planning processes involving multiple actors, institutional arrangements, and future-oriented uncertainties.

The research is interpretive and seeks to understand how actors construct meanings around an emerging mobility technology. This is consistent with the theoretical framework, where UTAUT is used as an analytical lens rather than a predictive model. Acceptance is therefore conceptualised as a socially and contextually constructed phenomenon shaped by planning practices, governance arrangements, and actor perspectives.

The design combines qualitative semi-structured interviews with institutional and professional actors and a complementary survey targeting both residents in Partille and a broader public sample. While the interviews provide in-depth insights into planning perspectives, responsibilities, and governance conditions, the survey captures broader public perceptions of autonomous transport and perceived safety.

Together, these methodological choices enable the study to address the research questions by linking institutional perspectives on implementation conditions with broader perceptions of safety, expectations, and concerns among potential users.

4.1 Interviews

Semi-structured interviews constitute the primary method of this study. This approach is suitable for examining how actors interpret and assign meaning to complex and future-oriented planning issues such as autonomous public transport. By enabling participants to articulate perceptions, expectations, and concerns in their own words, the method provides access to situated understandings of emerging mobility technologies (Kvale, 2007). The semi-structured format is defined as a planned, yet flexible form of interviewing aimed at obtaining descriptions of the interviewee's thoughts and interpretations of a specific phenomenon. This format allows the researcher to guide the conversation through key themes derived from the research questions and theoretical framework, while still giving respondents room to elaborate, introduce new aspects, and reflect freely (Kvale, 2007).

In certain cases, two representatives from the same unit were interviewed jointly. This was done to allow for interaction and collective reflection, while still ensuring that all participants had the opportunity to express their views. This format was chosen to facilitate discussion and interaction between actors

working within the same organisational context, allowing shared reasoning, disagreements, and collective reflections to emerge. Interviewing two respondents simultaneously was particularly beneficial because knowledge about AVs is limited among many people, given that it is a relatively new technology. Participants interviewed jointly with a colleague were positive about the format and expressed that it facilitated reflection and made it easier to confront a complex topic such as AVs.

Several interview guides were developed based on the study's research questions and the analytical dimensions derived from the theoretical framework (performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived safety). Separate interview guides were developed and adapted to each actor group. However, every interview was structured based on the theoretical framework. The guides structured the interviews around central themes while allowing follow-up questions to emerge during the conversation. This aligns with the view of the qualitative interview as a construction site for knowledge, where meaning is co-produced through interaction between interviewer and interviewee rather than simply extracted as fixed information (Kvale, 2007). The interview guides are available in Appendix A (original Swedish) and Appendix B (English translation).

The sampling was purposive and aimed to capture variation in roles, responsibilities, and perspectives relevant to the planning and implementation of autonomous public transport. Interviewees include municipal planners, regional public transport actors, local politicians, operators developing AVs and municipal business-development representatives (see table 2). These groups can be understood as institutional and professional actors with influence over planning processes, governance arrangements, or implementation conditions.

Table 2. Overview of interview participants

Role / Function	Number of participants	Actor category
Traffic planner / traffic engineer	2	Municipal
Urban planning	2	Municipal
Strategic development	2	Municipal
Business Development Department	2	Municipal
Politician	1	Municipal
Public transport strategist	1	Regional
Mobility development manager	1	Regional
AV strategy and implementation	1	Regional
Innovation and autonomous mobility	1	Private sector

Note: Total interviews = 9. Total participants = 13. Roles have been generalised to preserve anonymity.

Interviewing such actors shares similarities with what Rice (2010) refers to as “interviewing elites”, where participants hold specialised knowledge, decision-making power, or institutional authority. In these contexts, access, power relations, and positionality become important methodological considerations. Rather than treating interviewees simply as neutral informants, the study acknowledges that interviews are shaped by relational effects of power, where participants may frame issues strategically, restrict information, or draw on institutional narratives. Recognising these dynamics forms part of the reflexive approach adopted in this study (Rice, 2010). Respondents were selected based on their relevance to the research questions and their situated knowledge of planning, mobility, and local development, rather than on formal status alone. This aligns with an understanding of “elites” as actors with privileged access to knowledge relevant to the phenomenon under study.

Because many interviewees occupy professional or decision-making roles, the study adopts a reflexive stance toward the interview process. Power relations, institutional positions, and the researcher’s own role as a student affiliated with a municipal context are considered part of the knowledge production process. Interview data are therefore treated as situated accounts rather than neutral representations of reality. This perspective aligns with methodological discussions emphasising reflexivity and the context-specific nature of knowledge produced in elite and professional interviews (Rice, 2010).

In total, 9 interviews were conducted with 13 participants in different professional roles. The interviews were conducted between 3 March 2026 and 23 March 2026, either in person or online, and lasted approximately 30–45 minutes. With the participants’ consent, the interviews were audio-recorded and later transcribed. The informed consent form is available in Appendix C. The transcription focused on meaning and content rather than detailed conversational features, as the purpose of the analysis was to examine thematic patterns rather than linguistic interaction.

The interview material was analysed using an iterative thematic analysis. The analysis combined deductive and inductive coding. Initial coding was informed by the study’s analytical dimensions (performance expectancy, effort expectancy, social influence, facilitating conditions, and perceived safety) and additional themes then emerged from the empirical material during the iterative process. In this way, the analysis remained theoretically informed without restricting attention to pre-defined categories. Coding focused on how participants described conditions, expectations, opportunities, and concerns related to autonomous public transport as a planning issue. The coding process involved repeated readings of the transcripts, during which initial codes were identified, compared across interviews, and gradually refined into broader themes through an iterative process (Kvale & Brinkmann, 2021). All interview quotations presented in the analysis were originally in Swedish and have been translated into English by the author. Minor linguistic adjustments have been made to improve readability while preserving the meaning of the statements.

4.2 Survey

To complement the qualitative interviews, a short survey was conducted to capture the general public's perceptions of autonomous buses in urban environments. While the interviews provide in-depth insights into how different actor groups reason about autonomous public transport in a planning context, the survey provides a complementary perspective by identifying broader patterns in how individuals perceive and relate to autonomous buses beyond the institutional planning context captured in the interviews.

The survey was distributed through social media using convenience sampling. While this approach limits representativeness, it is appropriate for exploratory research aimed at identifying tendencies rather than producing statistically generalisable findings. The survey received 75 responses from respondents of different ages and with a relatively even gender distribution. The survey remained open for five weeks.

The survey was designed as a brief, structured questionnaire consisting mainly of closed questions divided into two parts: one section with background and categorising questions, and one section with 12 Likert-type scale items. This design aligns with survey research as a structured form of self-report data collection, where closed items and rating scales are commonly used to capture measurable attitudes and perceptions (Lam & Green, 2023). This format was chosen to lower the threshold for participation and increase response rates, as longer questionnaires with multiple open-ended questions may require more time and effort from respondents and can increase item non-response or dropout (Lam & Green, 2023). The survey therefore focuses on measurable attitudes rather than detailed narratives, with only one open-ended question included at the end to allow respondents to express additional reflections in their own words. The full survey questionnaire is included in Appendix E in its original Swedish version and in Appendix F as an English translation.

The questionnaire was structured in line with the analytical dimensions used in the study's theoretical framework. Several items correspond to key constructs derived from UTAUT, including performance expectancy (perceived usefulness in terms of accessibility and sustainability), effort expectancy (perceived ease of understanding how the system functions), and social influence (trust in different sources of information). In addition, perceived safety was explicitly included as a separate dimension, reflecting its central role in research on autonomous vehicles and its importance in this study. Background questions regarding mobility habits and everyday experience of urban centre environments were also included, to contextualise responses. Additional background variables, such as age and respondents' relation to Partille (for example whether and how frequently they visit the area), were also collected. These variables were not used to establish separate respondent categories, but rather to support the interpretation of attitudes regarding levels of familiarity with the local context and everyday exposure to similar environments.

The survey was not intended to produce statistically representative results for Partille municipality specifically. Instead, it was distributed more broadly to obtain enough responses and capture general perceptions of autonomous buses in urban contexts. In the analysis, the survey is therefore used as a complementary source of empirical material that illustrates tendencies, variations, and recurring concerns, rather than as a basis for statistical generalisation. Its main role is to support and contrast the qualitative findings from the interviews, contributing to methodological triangulation within the case study. Given the sampling strategy and limited sample size, findings from the survey should be interpreted as indicative rather than definitive. The survey results are therefore used to illustrate tendencies and variations rather than to draw statistically generalisable conclusions.

Survey data were analysed descriptively to identify patterns and variations in attitudes. Likert-scale responses were summarised and interpreted in relation to the qualitative findings. Open-ended responses were thematically reviewed to identify recurring concerns or reflections.

4.3 Visual Elicitation

To stimulate reflection and support discussion about autonomous public transport, visual elicitation was used within the interviews and the survey. Visual elicitation refers to the use of images or other visual material as prompts that help participants reflect on situations that may be difficult to discuss in purely abstract terms. Rather than functioning as an illustrative representation, the image served as an analytical prompt that facilitated meaning-making and enabled participants to project their understandings onto a shared visual reference (Pauwels, 2019).

In this study, the visual material consists of an AI-generated illustrative scenario depicting an autonomous bus operating in an urban environment (see Appendix D). This image was not presented as a technical proposal or design solution, but as a hypothetical situation intended to trigger reflection on issues such as safety, interaction with other road users, accessibility, and the role of autonomous transport in an urban centre. The image was produced to retain a degree of openness, avoiding overly specific or prescriptive representations that could constrain respondents' interpretations. The image was introduced after initial general questions, allowing participants first to express unprompted views before responding to the visual scenario. Responses to the visual scenario were analysed as part of the interview material, with attention to how the image shaped discussion of safety, interaction, and urban context.

Pauwels (2019) argues that visual elicitation can make interviews less intimidating and more engaging, while encouraging respondents to adopt the role of knowledgeable interpreters of depicted situations. Well-chosen visuals with projective potential may trigger deeper reflections and multilayered verbal responses, rather than only direct answers to abstract questions (Pauwels, 2019). The use of visual scenarios also enabled exploration of how perceived safety and facilitating conditions are articulated in relation to concrete spatial situations rather than abstract technological descriptions.

However, while visual elicitation offers advantages, it also requires careful methodological consideration. The researcher should remain attentive to how the content, style, and framing of images may influence interpretation (Pauwels, 2019). AI-generated images introduce an additional layer of mediation, as they are constructed representations shaped by prompts, aesthetic framing, and algorithmic training data rather than empirical observation. The image was therefore treated as a stimulus for discussion, not as a representation of future reality. During the interviews, participants were informed that the image was fictional and AI-generated, ensuring transparency regarding its origin. Although care was taken to maintain visual neutrality, specific design elements may still have influenced participants' interpretations.

4.4 Ethical Considerations

This study follows established research ethics principles concerning informed consent, voluntary participation, confidentiality, and responsible data management. All interview participants were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without consequence. Consent was obtained prior to each interview, and participants were informed about how the material would be used in the thesis. In the survey, no personally identifying information was collected. Responses are treated as anonymous and analysed to identify general patterns of perception rather than individual viewpoints.

Given the researcher's internship affiliation with a municipal context, particular care was taken to clarify the independent academic purpose of the study to avoid any perception of institutional obligation among participants. This was especially important in interviews with professional and decision-making actors. As several interviewees occupy identifiable roles within a relatively small municipal setting, particular attention was paid to anonymisation. Job titles and contextual details were generalised where necessary to prevent indirect identification. However, in some cases it could be possible to identify the participants, such as those with a particular job title in a small organisation. In these cases, the respondents were informed and participated with a signed consent form.

Audio recordings and transcripts were stored securely and accessed only by the researcher. All data will be deleted following completion of the thesis in accordance with university guidelines.

4.5 Use of AI

Artificial intelligence (AI) was used in a limited and clearly defined manner in this study. AI was not used to generate respondents' answers, conduct coding, or produce analytical findings. The core research design, data collection, coding, interpretation, and analytical reasoning are the independent work of the researcher.

AI was primarily used in two ways. First, generative AI tools were used to produce illustrative visual scenarios of autonomous buses operating in urban environments. These images were developed as visual

stimuli for the visual elicitation component of the study. The methodological implications of using AI-generated visuals are addressed in Section 4.3.

Second, AI was used to transcribe interviews. This was conducted using a GDPR-compliant programme that ensured secure file storage. AI-supported transcription was used to manage the time constraints associated with conducting and processing a relatively large number of interviews within the scope of a master's thesis. The transcripts were reviewed and corrected by the author before analysis.

The use of AI in this study is therefore limited to supportive and illustrative functions, while the research process and knowledge production remain grounded in established academic methods and ethical principles.

4.6 Methodological Limitations

This study was conducted within the scope of a master's thesis and is therefore shaped by practical limitations related to time, access, and scale. These conditions influenced both the number of interviews conducted and the reach of the survey distribution. Accordingly, the study does not aim to provide a comprehensive mapping of all relevant stakeholders or statistically representative measures of public attitudes. Instead, the research prioritises a qualitative and in-depth understanding of how different actors perceive and interpret the potential implementation of autonomous public transport.

The use of convenience sampling in the survey limits the generalisability of the quantitative findings. The survey results should therefore be interpreted as indicative patterns and tendencies rather than definitive measures of public opinion. Their main analytical function is to complement, contextualise, and contrast the qualitative interview material within the broader case study design.

Several methodological choices were also made to maintain a focused and analytically coherent study. While business actors were initially intended to have a larger role in the sample, the relevance of this perspective became more limited during the research process, partly due to the local context of Partille, where relatively few customer-intensive businesses are located in the town centre outside the shopping mall. Interviews instead indicated that labour market accessibility was of greater relevance than customer flows from a business perspective. As the study progressed, additional priority was therefore given to actors considered more central to the research questions, such as public transport representatives, vehicle operators, and regulatory actors. This iterative sampling process strengthened the study's ability to capture perspectives most relevant to implementation conditions.

As a single case study centred on Partille municipality and a hypothetical autonomous city-centre shuttle, the research prioritises contextual depth over broad generalisation. The findings are closely connected to this specific planning context, its governance structures, and local mobility conditions. At the same time, case studies can generate analytical insights that extend beyond the immediate setting,

and several findings may be relevant for other municipalities facing similar mobility structures, governance, or implementation challenges.

Finally, the study examines perceptions of an emerging and partly hypothetical technology. Attitudes toward autonomous public transport are likely to evolve alongside technological development, regulatory change, and increased public exposure through pilot projects. The findings therefore capture perspectives at a particular moment in time, characterised by uncertainty and limited real-world experience.

5. Results and Analysis

This chapter presents and analyses the empirical findings in relation to the research questions and theoretical framework. The analysis is based primarily on semi-structured interviews with institutional and professional actors, complemented by survey results capturing broader public perceptions. The interview material was coded thematically through a combination of deductive categories derived from the theoretical framework and inductive themes emerging from the empirical material.

The chapter is structured around the main analytical themes identified in the coding process: urban context and mobility challenges, expected benefits and opportunities, knowledge and behavioural adaptation, facilitating conditions, and perceived safety and trust. Together, these themes illustrate how autonomous public transport is interpreted differently across actor groups and how these interpretations shape perceived implementation conditions.

5.1 Urban Context and Mobility Challenges

This theme outlines how different actors describe current mobility conditions and challenges, both in the case study area and in a broader context. These conditions shape both the need for, and the potential role of, autonomous buses and shuttles as a complementary mobility solution. Across interviews, the existing mobility system is generally perceived as functional but characterised by several structural limitations and imbalances. These challenges are closely related to spatial organisation, modal priorities, and gaps in connectivity. More generally, public transport is described as functioning well in areas with high travel demand and density, while challenges tend to emerge in less dense, suburban contexts where accessibility and service provision are difficult to maintain. These findings align with previous research highlighting first- and last-mile challenges and fragmented urban accessibility as key issues in public transport systems (see Chapter 2.4).

A central and recurring point across multiple interviews is the strong reliance on private cars, both in general and particularly in Partille. The current mobility system is frequently described as being structured around car use, where many everyday trips are easiest to make by car, while alternative modes are less convenient or coherent. As one municipal strategic developer stated:

“It is extremely car-oriented. [...] It is built for travelling by car between different places. That is very clear. It is not very easy to cycle. [...] It feels like the only thing that is easy is driving.”

This car dependency is not only linked to individual preferences, but also to how infrastructure and urban form have developed, reinforcing a system where the car is often perceived as the most accessible and reliable option. The car is also described as a highly convenient and flexible mode of transport, which makes it difficult for alternative modes to compete in many everyday travel situations. In this sense, car dependency should be understood both as a structurally produced system outcome and an individual behavioural choice.

Mobility in Partille is shaped by its fragmented spatial structure, especially in the central part of the municipality. Several respondents describe how key destinations, such as the travel centre, commercial areas, and emerging developments like Partille Port, are perceived as disconnected from one another. Although distances are relatively short, they are often considered too long to walk comfortably for all people, particularly in everyday situations. This creates a sense of separation between different parts of the centre, which in turn affects both mobility patterns and the overall coherence of the urban environment. The challenge is therefore not only distance as such, but how these distances are experienced in practice. In a broader context, outside of the city centre, the geography of Partille is challenging, as it is characterised by hilly terrain and steep gradients that make movement without a car challenging. These conditions illustrate how mobility challenges in Partille are shaped by a combination of spatial fragmentation, car-oriented development, and limited internal connectivity.

The issue of first- and last-mile connectivity further reinforces this interpretation. While major public transport nodes are generally well served, there is a consistent gap between these nodes and final destinations, such as workplaces, residential areas, and commercial locations. This gap is recognised across all actor groups, indicating a shared understanding of a key systemic weakness. Importantly, this does not reflect a failure of the public transport system in isolation, but rather a lack of integration between different scales of mobility. As a result, even short trips become car-dependent, not because of distance, but because of insufficient continuity within the transport system. This highlights how accessibility is shaped by the relational functioning of the system, rather than by individual components.

In addition to these spatial and infrastructural challenges, several respondents highlight organisational and institutional conditions that shape the current mobility system. A recurring issue concerns the division of responsibilities between different actors, particularly between municipalities and regional actors responsible for public transport, such as Västra Götalandsregionen and Västtrafik. While municipalities are responsible for spatial planning and the design of the built environment, decisions regarding public transport routes, services, and operations are largely controlled at the regional level. This division creates a structural gap between planning and implementation, where municipalities can identify mobility needs and propose solutions, but have limited direct influence over how public transport is ultimately organised. This underscores that mobility challenges are not only technical or spatial, but also institutional, reflecting a misalignment between planning authority and operational control. As a result, achieving integrated mobility solutions becomes contingent on coordination rather than direct action, which may limit the ability to address locally identified needs.

Institutional structures also shape the temporal dimension of change. Long-term procurement contracts, often extending over periods of up to ten years or more, and established operational models create path dependency, where existing systems persist even when new solutions are considered desirable. However, the findings nuance this picture by showing that perceived inertia is not absolute. While some

respondents emphasise the need for significant organisational adaptation, such as shifts in competencies and working practices, others point out that transitions can occur relatively quickly once key conditions are in place. The example of bus electrification illustrates that change can occur rapidly once key conditions align. This suggests that the transport system is not inherently resistant to change, but rather selectively adaptable, depending on political prioritisation, technological maturity, and institutional alignment.

From a local perspective, this results in a particular governance logic in Partille, characterised by openness to innovation combined with risk aversion. While new solutions such as autonomous shuttles are viewed positively in principle, their implementation is seen as contingent on prior testing and validation elsewhere. This reflects a “wait-and-see” approach, where uncertainty is managed by relying on external experiences rather than local experimentation. This further reinforces the importance of broader system dynamics in shaping local implementation conditions.

Finally, differences between actor groups reveal that mobility challenges are interpreted through distinct institutional lenses. Municipal actors emphasise spatial fragmentation and local accessibility, regional actors focus on system efficiency and service provision, while operators prioritise demand patterns and economic viability. These differences are not merely variations in opinion, but reflect fundamentally different problem framings, which in turn shape what is perceived as relevant solutions. This indicates that mobility challenges are not objectively defined, but constructed through actor-specific perspectives, which has direct implications for how solutions such as autonomous transport are evaluated and implemented.

Taken together, the findings show that municipal actors primarily emphasise spatial fragmentation and local accessibility challenges, while regional actors tend to highlight broader system efficiency and service provision across different geographic contexts. Operators, in turn, focus more on demand patterns and economic viability. This reinforces the understanding of mobility systems as socio-technical and governance-dependent, where both issues and solutions are shaped through the interplay of physical, organisational, and perceptual factors.

5.2 Expected Benefits and Opportunities

This section explores how different actors construct the expected benefits of autonomous public transport, and how these expectations shape its perceived role within the mobility system. While there is broad agreement that autonomous buses and shuttles may provide value, the findings show that perceived usefulness is not a stable or universally defined concept. Instead, it is relational and actor-dependent, shaped by how different groups interpret existing mobility challenges and system priorities. This corresponds with previous studies that emphasise accessibility, efficiency, and cost reduction as key benefits of autonomous public transport (see Chapter 2.4).

Survey results indicate a generally positive but uncertain attitude towards autonomous mobility. A majority of the respondents (59%) express a positive attitude towards autonomous public transport, while 23% are negative and 19% remain neutral. Similarly, 53% perceive a clear value in autonomous vehicles as a complement to existing public transport, whereas 23% do not and 24% are undecided. This illustrates that perceived usefulness is emergent rather than established, where the concept is accepted in principle but lacks a clearly defined function in everyday mobility imaginaries. Accordingly, acceptance appears to precede concrete understanding, indicating that perceived usefulness is still under formation.

Across interviews, there is strong agreement that autonomous transport should initially be understood as a complement rather than a replacement to existing public transport. This shared framing is significant, as it positions autonomous mobility not as a disruptive innovation, but as a system-enhancing technology. However, a respondent from Västtrafik suggests that it has the potential to revolutionise public transport completely by replacing existing vehicles with AVs. Its usefulness is therefore primarily evaluated in terms of how well it addresses specific deficiencies within the current system, rather than its ability to transform the system as a whole.

Two core functions consistently emerge as central to perceived usefulness. First, the possibility of continuous or 24/7 service is highlighted as a key advantage. This is especially relevant in contexts where demand varies over time, or where current service levels are limited outside peak hours. This points to a perceived limitation of current systems, where service provision is often temporally uneven. Autonomous operation is thus associated with increased flexibility and availability, suggesting that usefulness is partly defined in relation to temporal accessibility, rather than only spatial coverage.

Second, and more prominently, autonomous shuttles are framed as a solution to first- and last-mile challenges. This function directly mirrors the structural gaps identified in Section 5.1, indicating a strong alignment between perceived challenges and proposed solutions. Importantly, this reinforces that perceived usefulness is not abstract, but grounded in context-specific deficiencies, particularly the lack of internal connectivity in suburban and commuter contexts. Autonomous transport is therefore valued not for its technological novelty, but for its potential to complete existing mobility chains.

Despite this shared baseline, the findings reveal significant differences in how usefulness is interpreted across actor groups. Regional actors and operators primarily frame usefulness in terms of economic efficiency and system optimisation. The potential reduction in labour costs is seen as a key driver since today's labour costs are described as accounting for approximately half of the operating expenses in public transport, meaning that the removal of the driver could significantly reduce costs. As one public transport actor frames it:

“Driver costs account for roughly 50–70 percent of operating costs. That means you could either run twice as much service or operate it at half the cost. In that sense, it could become revolutionary.”

From this perspective, autonomous transport is understood as a tool for improving system performance within existing operational logics. This illustrates an efficiency-oriented understanding of usefulness, where the value of autonomous transport is primarily associated with productivity, scalability, and system performance rather than broader spatial or social objectives.

Closely related to this is the potential for more flexible and demand-responsive service models. Several respondents, particularly at the regional level, highlight how autonomous transport could enable a shift away from fixed timetables towards more on-demand solutions that respond to real-time user needs. The operator also argued that AVs could make public transport more predictable overall. Unlike conventional buses, where driving style may vary between drivers, an AV would stop in the same position each time and operate more consistently. This reflects a broader ambition to make public transport more competitive with private car use by increasing flexibility and convenience.

In contrast, municipal actors tend to emphasise spatial and urban development benefits. Here, autonomous transport is framed less in terms of cost efficiency and more as a tool for improving internal accessibility and strengthening the coherence of the urban environment. In the case of Partille, where the centre is described as fragmented, autonomous shuttles are seen as a potential way to connect key destinations such as the travel centre, commercial areas, and new developments like Partille Port. This indicates a place-based understanding of usefulness, where value is derived from how the technology contributes to urban structure, accessibility, and everyday movement patterns, rather than system-wide efficiency.

From a business and labour market perspective, improved accessibility is also highlighted as a key benefit, but with a distinct emphasis on economic functionality. Limited public transport access to employment areas is described as a barrier for both employees and employers, particularly in areas lacking direct connections from the main transport hub. Business-related actors particularly highlighted autonomous mobility in relation to labour market accessibility and access to employment areas. One respondent from the municipal business development department argued that:

“None of our largest business areas have sufficient public transport access, and that becomes a barrier to employment.”

Respondents especially connected this to first-job opportunities for younger groups and accessibility to workplaces located outside the town centre. Autonomous shuttles are therefore seen as a means of improving labour market accessibility, highlighting how mobility is understood as an enabling condition for economic activity. This expands the notion of usefulness beyond transport performance to include broader socio-economic functions.

Additionally, some business-oriented and political perspectives highlight the potential of autonomous shuttles to strengthen the attractiveness of the local centre and support the visitor economy. Improved

connections between key destinations, such as the travel centre, commercial areas, and event venues, are described as lowering the threshold for movement within the area and increasing flows between different parts of the centre. This illustrates that autonomous transport may contribute not only to improved mobility, but also to increased urban vitality and the functioning of local economies.

Potential social benefits are also highlighted, particularly regarding accessibility for groups with limited mobility options, such as elderly people, children, and individuals without access to a car. This reflects a normative dimension of usefulness, where autonomous transport is associated with equity and inclusion, rather than efficiency alone. In this sense, perceived usefulness is partly shaped by broader societal values and planning goals.

Moreover, environmental benefits are also mentioned, particularly in relation to reducing short car trips and supporting more sustainable travel patterns. However, these benefits are generally described as conditional, depending on how the technology is implemented and whether it is combined with broader measures aimed at reducing car dependency. This highlights that the environmental impact of autonomous mobility is not inherent but shaped by policy choices and implementation strategies.

Perceived usefulness therefore emerges not as a singular or objective property of autonomous transport, but as a multidimensional and contested concept. Different actor groups attribute value based on their institutional roles, responsibilities, and problem framings, resulting in parallel interpretations of what autonomous mobility is “for”. This aligns with the concept of performance expectancy in UTAUT but also extends it by showing that in a planning context, usefulness is not only individually perceived but collectively negotiated.

5.3 Knowledge, Acceptance and Behavioural Change

This theme examines how different actors understand the effort associated with adopting autonomous public transport, and how acceptance is expected to develop over time. Across interviews, there is a broad consensus that travel behaviours and attitudes will evolve, and that autonomous public transport will eventually become accepted as part of the public transport system. However, there are notable differences between actor groups regarding the pace and conditions of this transition. The findings indicate that effort expectancy in this context is not primarily related to practical usability. Instead, it is shaped by knowledge, familiarity, and trust, as well as by broader processes of social adaptation. This reflects earlier research showing that trust, familiarity, and perceived safety are central for acceptance of autonomous mobility (see Chapter 2.4).

Actors with direct experience from pilot and test projects, particularly within Västtrafik and the public transport operator, tend to frame the transition as relatively straightforward. From this perspective, autonomous vehicles are not seen as a fundamentally new mode of transport, but rather as a continuation of existing systems in which the driver is replaced by a technological function. This reflects an

understanding of the technology as operationally equivalent to current public transport, suggesting that the perceived effort of adoption is low once the system is introduced. Importantly, this perspective highlights a distinction between actual complexity and perceived complexity, where barriers to acceptance are seen as rooted in misconceptions rather than in the system itself. Several respondents described acceptance as something likely to evolve through familiarity and gradual exposure. One regional mobility actor reflected that:

“After five minutes, you get used to it, not after five years.”

This reflects how acceptance was often understood as a dynamic process shaped by experience, familiarity, and normalisation rather than fixed attitudes towards the technology itself.

In contrast, municipal actors articulate a more gradual and socially embedded view of behavioural change. They emphasise that travel habits are deeply ingrained and evolve over time, suggesting that the effort associated with adoption is not located in the act of using the system, but in reconfiguring everyday mobility practices. From this perspective, the introduction of autonomous vehicles requires not only technological readiness, but also social adaptation, learning processes, and increased familiarity among users. This underscores a more cautious view of how quickly new mobility solutions can be integrated into everyday practices.

A central finding across actor groups is the importance of knowledge and understanding. Questions such as “why no driver?” and concerns about system functionality indicate that autonomous transport is still perceived as unfamiliar and partially opaque. Survey results reinforce this interpretation, as most respondents report having heard about autonomous vehicles but lack an understanding of how they function. At the same time, the system is not generally perceived as difficult to use. This implies that effort expectancy is not constrained by usability barriers, but by epistemic uncertainty, where limited knowledge creates perceived complexity and hesitation. Accordingly, the effort lies in making sense of the technology, rather than in interacting with it.

The findings also indicate that public acceptance is closely tied to institutional trust. Most of the survey respondents express that they would trust the municipality if autonomous transport were implemented, while only a small share indicate distrust. Public actors therefore appear to mediate acceptance, as institutional credibility plays an important part in shaping how new technologies are perceived. Similar reflections are made by a regional actor who suggests that the public generally trusts public authorities and Västtrafik. However, this trust is not uniform. While some actors assume a general baseline of institutional trust, others point to declining trust at the local level. Acceptance is therefore contingent on context-specific trust relations, which may vary between places and actor groups.

Moreover, acceptance is described as fragile and reversible. Several respondents emphasise that autonomous mobility is particularly sensitive to negative events, where a single failure or accident could

significantly undermine trust. From this perspective, acceptance is not a linear process, but one characterised by thresholds and tipping points, where trust can be built gradually but lost rapidly. Effort expectancy is therefore linked not only to initial adoption, but also to the maintenance of confidence over time.

Finally, several actors frame autonomous transport as a realistic future scenario, but in a conditional manner. Acceptance is often expressed as dependent on demonstrated reliability, rather than on abstract expectations of future potential. This reflects a pragmatic and experience-based logic of acceptance, where trust is built through exposure and proven performance. In this sense, behavioural change is not driven by persuasion alone, but by accumulated experience and normalisation processes.

These findings suggest that effort expectancy in the context of autonomous public transport is fundamentally reconfigured compared to its original formulation in UTAUT. Rather than relating to ease of use, it is shaped by perceived complexity, uncertainty, and processes of familiarisation. Adoption depends less on the functional interaction with the system, and more on how the technology is understood, communicated, and embedded in everyday practices. This extends the concept of effort expectancy by showing that in a planning context, the “effort” of adoption is less about technical usability, and more about perceived complexity, uncertainty, and the social process of becoming familiar with a new technology.

5.4 Facilitating Conditions for Implementation

This section explores the institutional and practical conditions that shape the implementation of autonomous public transport. While many actors recognise the potential benefits of autonomous mobility, the findings indicate that its implementation is shaped by a complex set of interdependent facilitating conditions. These are embedded in regulatory frameworks, market dynamics, governance structures, and organisational capacities. These findings support previous research emphasising regulatory uncertainty and unclear responsibility as key barriers to implementation (see Chapter 2.3).

A central issue concerns the regulatory framework, which is consistently described as under development but not yet aligned with technological progress. While initiatives such as the *Transformationskarta* (see chapter 2.3) indicate that institutional change is underway, respondents highlight a lack of clarity regarding legal responsibility, operational conditions, and large-scale deployment. This suggests a temporal misalignment between technological readiness and regulatory adaptation, where innovation advances faster than the institutional structures required to support it. As a result, regulation functions both as an enabler and a constraint, shaping not only what is possible, but also when and under what conditions implementation can occur.

Closely related to this are market conditions and economic factors, particularly emphasised by actors involved in pilot and test projects. The high cost of autonomous vehicles, combined with limited

production volumes, creates a structural dilemma where large-scale deployment is required to reduce costs, yet uncertain demand prevents producers from scaling up production. As one respondent with the regional perspective described:

“It becomes a kind of chicken-and-egg problem. You need large-scale implementation to reduce costs, but the costs are still too high for large-scale implementation.”

Similar challenges have also been identified in previous research, which argues that the commercial deployment of autonomous vehicles is likely to depend on highly utilised shared mobility platforms due to the substantial costs associated with AV technology (Freund et al., 2024). This suggests that implementation is constrained not by the absence of technology alone, but also by the absence of market stability, organisational coordination, and predictable demand. To address this, several respondents suggest increased coordination across organisations, regions, and countries, highlighting that facilitating conditions extend beyond individual actors and instead require collective action and long-term coordination at a system level.

The structure of public transport procurement further reinforces these constraints. In the regional context, services are typically organised through long-term contracts, often extending up to ten years or more. These contractual arrangements create a relatively inflexible system, where changes to routes, services, or technologies are difficult to implement in the short term. As a result, even when new solutions are identified as desirable, they must align with existing contractual frameworks, which can delay or constrain implementation. This reflects a form of path dependency, where current systems persist due to institutional structures rather than solely technical limitations. In this sense, facilitating conditions are shaped not only by what is technically feasible, but by what is contractually and organisationally possible.

Governance structures also play a central role in shaping implementation conditions. Responsibilities for mobility are distributed across multiple actors, with municipalities responsible for spatial planning and regional authorities responsible for public transport provision. This division means that the implementation of autonomous mobility solutions requires coordination across institutional boundaries. As one regional actor explained:

“We need to develop the city and the public transport system hand in hand and make sure they align with one another.”

Several respondents emphasise the importance of early collaboration to align planning processes with transport provision. However, such coordination is not always straightforward, as actors operate within different mandates, timelines, and priorities. This highlights how implementation challenges are not simply about the presence of supportive structures, but about the alignment of institutional logics.

There are also notable differences between actor groups regarding the role of physical infrastructure. Municipal actors tend to emphasise the need for infrastructural adjustments, reflecting a planning-oriented focus on spatial integration and local responsibility. In contrast, regional actors and operators often argue that autonomous vehicles can operate within existing infrastructure, reflecting greater familiarity with the technology and a focus on system efficiency. This divergence reflects differing perspectives on risk, responsibility, and system integration, as well as varying levels of familiarity with the technology.

From a municipal planning perspective, several respondents emphasise the importance of defining a clear purpose prior to implementation. Autonomous transport is not seen as a solution in itself, but as a tool that must be aligned with specific mobility needs. This reflects a shift from a technology-driven to a problem-oriented approach, where implementation is contingent on clearly identified use cases and integration with broader planning strategies. This further reinforces that facilitating conditions are not only structural, but also strategic, depending on how the technology is framed and positioned within the planning process.

In addition to structural constraints, respondents also reflect on organisational capacity and the need for adaptation. Some emphasise that the introduction of autonomous mobility would require shifts in competencies, working practices, and organisational routines. At the same time, others point out that change can occur relatively quickly once enabling conditions are in place. The electrification of bus fleets is highlighted as an example of a transition that, once initiated, scaled rapidly across the system. This suggests that perceived organisational inertia is not fixed, but contingent on factors such as political prioritisation, technological maturity, and institutional readiness.

From a municipal and political perspective, there is generally an expressed openness towards new mobility solutions, provided that they are perceived as functional and reliable. However, this openness is accompanied by a degree of caution. Several respondents describe a reluctance to act as a first mover in adopting new technologies, preferring instead to rely on tested solutions and experiences from other contexts. This reflects a risk-averse approach, where uncertainty, particularly related to safety, reliability, and public acceptance, plays a significant role in decision-making.

Finally, practical and spatial conditions are also emphasised as important for implementation. Autonomous shuttles are generally perceived as more feasible in controlled or clearly defined environments, while more complex and dynamic urban settings are seen as more challenging. This indicates that the applicability of autonomous transport is context-dependent and shaped by local spatial conditions.

Taken together, the findings demonstrate that facilitating conditions for autonomous public transport are not reducible to technical infrastructure or organisational support alone. Instead, they constitute a multi-level system of interdependent conditions, where regulatory frameworks, market structures, governance

arrangements, and spatial contexts interact to shape implementation possibilities. This extends the concept of facilitating conditions in UTAUT by showing that, in a municipal planning context, they are fundamentally institutional and relational, rather than merely technical or organisational.

5.5 Perceived Safety and Trust

This theme outlines how different actors perceive safety and risk in relation to autonomous public transport, and how these perceptions shape trust in the technology. While autonomous vehicles are often framed in terms of efficiency and innovation, the findings indicate that perceived safety functions as a critical condition for acceptance, with the potential to both enable and constrain implementation. Importantly, safety is not understood as a purely technical attribute, but as a socially constructed and context-dependent experience.

Across interviews, safety concerns are closely related to the absence of a driver. The driver is not only associated with operational control, but also with responsibility, authority, and social reassurance. Respondents frequently describe the driver as a visible point of accountability in situations of uncertainty, such as technical disturbances, conflicts between passengers, or interactions with vulnerable users. Safety is partly derived from human presence as a symbolic and relational function, rather than from measurable system performance alone. This perspective is particularly evident among municipal and planning-oriented actors, who emphasise how safety is experienced in everyday urban environments. Concerns are raised about being in enclosed spaces with unfamiliar people, and about how situations would be handled without a visible authority figure on board. These reflections highlight how perceived safety is shaped by both the physical setting and social interactions within the transport environment.

At the same time, other actors challenge the assumption that a human driver inherently guarantees safety. Representatives from operating companies emphasise that drivers are primarily focused on vehicle operation and may have limited capacity to monitor on board situations. In contrast, autonomous systems are described as capable of continuous monitoring through sensors, cameras, and remote-control functions. This introduces the notion of “false safety”, where trust in human presence is based on familiarity rather than actual performance. From this perspective, technological systems may in some cases provide higher levels of control and oversight, even if they are perceived as less safe.

The findings reveal a fundamental tension between two different logics of safety: one based on social presence and human interaction, and another based on technological reliability and system performance. These logics coexist rather than replace one another, and their relative importance varies between actor groups depending on professional roles, experiences, and knowledge of the technology. Perceived safety is therefore better understood as negotiated and context-dependent than as a fixed attribute.

Furthermore, some respondents highlighted uncertainty regarding how autonomous vehicles would interpret complex urban interactions, particularly in pedestrian-dense shared spaces. One municipal actor questioned how a self-driving shuttle would operate within environments based on informal interaction and negotiated movement between different traffic users:

“At Kyrktorget we have a kind of shared-space environment where different traffic users interact informally. How would a self-driving bus interpret that situation?”

This illustrates broader concerns regarding how autonomous systems would function in crowded urban settings characterised by unpredictability, shared spaces, and continuous pedestrian movement.

Survey results further reinforce this tension. While many respondents indicate that autonomous transport would be relatively easy to use, there is greater uncertainty regarding how safely it would function, particularly in complex traffic environments. A majority also express a preference for having a driver on board, highlighting the continued importance of human presence in shaping perceptions of safety. Perceived safety therefore appears to be shaped as much by familiarity and existing mental models as by assessments of technological capability.

Finally, several actors express a conditional form of trust, where acceptance of autonomous transport depends on demonstrated performance in real-world contexts. This reflects a learning-based and experiential process of trust formation, where exposure and familiarity play a key role in reshaping perceptions. Rather than being established in advance, trust is gradually constructed through interaction with the technology, aligning with broader processes of normalisation identified in previous sections.

Perceived safety therefore cuts across the other themes in the analysis. It shapes how usefulness is evaluated, how effort is perceived, and how facilitating conditions are interpreted. This implies that successful implementation of autonomous public transport depends not only on achieving high levels of technical safety, but on aligning technological performance with social expectations, institutional trust, and everyday experiences of security. In this sense, safety emerges as a key interface between technology, users, and governance, rather than as a purely technical property.

5.6 Summary of Findings

The findings across the identified themes indicate that the implementation of autonomous public transport is shaped by a combination of perceived usefulness, knowledge and behavioural adaptation, institutional and organisational conditions, and perceived safety. These dimensions are closely interrelated and interpreted differently across actor groups, reflecting their roles, responsibilities, and experiences.

While there is broad agreement that autonomous transport may provide value as a complementary solution, the findings highlight that its implementation is not determined by technological readiness

alone, but by how different actors understand, prioritise, and negotiate mobility-related challenges within a specific planning context.

Furthermore, the results show that differences between actor groups are not merely variations in opinion, but reflect underlying differences in institutional roles, knowledge, and perspectives on mobility systems. These differences influence how benefits, risks, and implementation requirements are defined, and therefore shape the perceived conditions for implementation.

Overall, the findings suggest that autonomous public transport should be understood as a socio-technical and governance-related issue, where successful implementation depends on alignment between technological possibilities, institutional structures, and actor perspectives. Coordination, communication, and shared understanding are therefore central conditions for moving from experimentation to broader implementation. Table 3 summarises the dominant patterns identified across actor groups and should be understood as an analytical synthesis of the empirical material.

Table 3 highlights clear differences in how actor groups interpret both the role and the conditions for implementing autonomous public transport. Municipal actors primarily frame autonomous buses as a spatial and accessibility tool, emphasising their potential to connect fragmented urban areas and improve internal mobility. In contrast, political actors focus on legitimacy, public value, and the need for proven solutions, reflecting a stronger emphasis on risk and public acceptance.

Business actors interpret autonomous transport in relation to labour access and the functioning of the local economy, where the key concern is whether the solution effectively meets real mobility needs. Regional actors adopt a system-level perspective, focusing on efficiency, cost structures, and the integration of autonomous services within the wider public transport system. Finally, private operators emphasise operational and economic feasibility, highlighting issues related to business models, scalability, and procurement structures.

These differences illustrate that the implementation of autonomous public transport is shaped by fundamentally different logics across actor groups, where each group defines both the problem and the solution in relation to its own institutional position. As a result, implementation depends not only on aligning technical and organisational conditions, but also on reconciling these differing perspectives into a shared understanding of purpose and value.

Table 3. Summary of findings across actor groups

Actor group	Main mobility challenges	Perceived role of AVs	Key implementation conditions	Main concerns
<i>Municipal actors</i>	Fragmented urban structure; local accessibility gaps; car dependency	Connectivity between key destinations; enhance internal mobility; complement existing public transport	Clear purpose and use case; alignment with regional actors; adaptation of local infrastructure	Safety; responsibility; resource constraints
<i>Political actor</i>	Accessibility and transport equity (youth, elderly); need for attractive alternatives to car use	Improve accessibility and commuting; Connectivity between key destinations; support local activity	Clear public value and legitimacy; preference for proven and tested solutions	Risk aversion; preference for tested solutions before local implementation
<i>Business actors</i>	Accessibility to workplaces (last-mile); centre attractiveness and visitor flows	Strengthen labour access (last-mile connectivity); support local vitality	Useful routes aligned with workplaces; Value for businesses; adapted to work schedules	Must meet real mobility needs; alignment with employee travel patterns
<i>Regional actors</i>	Service gaps in lower-demand areas; Competitiveness to private car; system efficiency constraints	First-/last-mile solution; On-demand service; improved service in lower-demand areas; increased cost-efficiency	Regulatory frameworks; procurement structures; organisational adaptation; market maturity and viable business models	Long contracts and system lock-in; unclear regulatory frameworks; complexity due to multiple actors
<i>Private operator</i>	Weak business cases in low-demand contexts; labour shortages	Cost-efficient and scalable; improved service and flexibility; more predictable operations	Sufficient funding and investment; market maturity and larger deployment volumes	Long procurement contracts and system lock-in; regulatory uncertainty
<i>Public respondents</i>	Car dependence; mixed views of public transport alternatives	Useful as complement to existing transport	Proven safety; clear usefulness; trustworthy implementation	Safety in traffic; preference for driver on board

6. Discussion and Conclusion

This chapter discusses the findings of the study in relation to the research questions and theoretical framework. The aim is to synthesise what the findings reveal about autonomous public transport as a municipal planning and governance issue.

The discussion should be read considering the study's methodological scope. The empirical material is based on a limited number of interviews and survey responses and should therefore not be understood as representative of each actor group. However, the qualitative case study approach enables a deeper understanding of how actors with different responsibilities, experiences, and institutional positions interpret the opportunities, challenges, and conditions associated with autonomous mobility. The chapter first answers the research questions, before discussing actor logics, multi-level implementation, limitations, and final conclusions.

6.1 Answering the Research Questions

How do different actor groups interpret the role and potential of autonomous buses in a multi-level planning context?

The first research question concerned how different actor groups interpret the role and potential of autonomous buses in a multi-level planning context. The findings suggest that autonomous public transport is primarily understood as a complementary mobility solution, rather than as a replacement for existing public transport. However, the more significant finding is not simply that actors see autonomous buses as complementary, but that they attach different meanings to this complementary role. For municipal actors, complementarity is mainly related to spatial integration and improved internal accessibility. For regional and operator-related actors, it is more strongly connected to system efficiency, service optimisation, and cost reduction. Business-related perspectives, in turn, link autonomous mobility to labour market accessibility and local economic functionality.

This indicates that autonomous public transport does not have one fixed role in the planning context. Rather, its role is constructed through the institutional position of each actor group. The same technology is therefore interpreted simultaneously as an accessibility tool, an efficiency measure, an economic enabler, and a potential trust challenge. This finding is important because it suggests that implementation depends not only on whether actors support the technology, but on whether their different understandings of its purpose can be aligned.

What institutional, spatial, and social conditions are perceived to enable or constrain the implementation of autonomous buses?

The second research question concerned the institutional, spatial, and social conditions perceived to enable or constrain the implementation of autonomous buses. The findings suggest that implementation

is shaped by a combination of interdependent conditions rather than by one single barrier. Regulatory uncertainty, long procurement cycles, market immaturity, and unclear divisions of responsibility all appear as central institutional constraints. These conditions do not necessarily prevent implementation, but they shape the pace, scale, and form through which autonomous public transport can realistically be introduced.

A key implication is that technological readiness alone is insufficient if institutional structures are not prepared to support deployment. Even when actors perceive autonomous buses as potentially useful, implementation depends on legal clarity, procurement flexibility, organisational capacity, and coordination between public and private actors. In this sense, facilitating conditions should not be understood only as technical infrastructure or user support, as in a narrower interpretation of UTAUT. In a municipal planning context, they also include governance capacity, regulatory alignment, and the ability of institutions to adapt existing systems to new forms of mobility.

Spatial conditions further shape implementation possibilities. Autonomous shuttles are perceived as more feasible in clearly defined, relatively controlled environments where routes, interactions, and traffic conditions can be anticipated. At the same time, complex urban settings with pedestrians, cyclists, shared spaces, and informal movement patterns are understood as more challenging. This indicates that the suitability of autonomous buses is strongly context dependent. Implementation is therefore not simply a matter of introducing a vehicle into an existing street environment, but of assessing whether the spatial context supports safe, reliable, and meaningful operation.

Social conditions are equally important. Trust, perceived safety, familiarity, and public acceptance influence whether autonomous buses are seen as legitimate and usable. The findings suggest that acceptance is likely to develop gradually through exposure, learning, and normalisation rather than through information alone. This reinforces the importance of pilot projects and small-scale applications, not only as technical tests but as socio-technical learning environments where institutions, users, and operators can build experience. Taken together, the findings show that implementation is enabled or constrained by the alignment between institutional readiness, spatial suitability, and social trust.

How do these perceptions differ between actor groups, and how do such differences shape implementation conditions?

The third research question focused on how perceptions differ between actor groups and how these differences shape implementation conditions. The findings show that actors do not simply differ in whether they are positive or negative towards autonomous buses. Rather, they differ in how they define the problem that autonomous mobility is expected to solve. This is an important distinction, as implementation depends not only on general support for the technology, but on whether actors share a sufficiently aligned understanding of its purpose.

Municipal actors tend to interpret autonomous buses through a spatial and planning-oriented logic. Their concerns relate primarily to local accessibility, urban integration, traffic environments, and the physical conditions required for safe operation. From this perspective, autonomous transport is evaluated according to how well it can support centre development, connect fragmented urban areas, and contribute to broader planning goals. Regional actors and operators, by contrast, more often frame autonomous mobility through a system-efficiency logic. They emphasise operational costs, service levels, demand patterns, and the potential to improve public transport provision within existing or future service models. Business-related actors add a further perspective by connecting mobility to labour market accessibility, workplace access, and local economic functionality.

These differences matter because they shape what each actor considers to be the key implementation condition. The same technology is therefore evaluated through several parallel logics: spatial, operational, economic, social, and institutional. This has direct implications for governance, as implementation requires coordination between actors with different mandates, responsibilities, and time horizons. These tensions are discussed further in the following section.

6.2 Actor Logics and Conceptual Barriers to Implementation

While the findings suggest the importance of bridging perspectives between actor groups, they also reveal underlying tensions that may complicate implementation. Rather than representing a shared understanding of autonomous public transport, the different perspectives reflect distinct and sometimes competing actor logics regarding what the core mobility problem is and how it should be addressed. Municipal actors tend to frame autonomous buses as a spatial and planning-oriented solution for improving accessibility, strengthening internal connectivity, and enhancing urban cohesion. Regional actors and operators, in contrast, primarily emphasise efficiency, scalability, service provision, and system optimisation. Political perspectives add another layer, where legitimacy, reliability, and risk management become central concerns.

This indicates that barriers to implementation are not only institutional, technical, or financial, but also conceptual. Actors are not necessarily aligned in how they define success. A solution that is considered efficient and scalable from a regional or operational perspective may not fully address locally perceived accessibility needs. Similarly, a solution that appears attractive from a municipal planning perspective may still be constrained by procurement structures, regulatory uncertainty, or political caution. In this sense, implementation depends not only on whether autonomous buses are seen as useful, but on whether different actors can develop a sufficiently shared understanding of what the technology is expected to achieve.

This is particularly important in a municipal planning context, where autonomous public transport is positioned between several governance levels. The municipality may identify local mobility problems and spatial opportunities, but large-scale implementation depends on regional transport planning,

procurement systems, regulatory frameworks, and market development. The findings therefore suggest that coordination is not only a practical requirement, but also an interpretive process. Actors need to align not only responsibilities and resources, but also problem definitions, expectations, and criteria for success.

Theoretically, this suggests that UTAUT can be extended in municipal planning contexts by interpreting acceptance as a relational and institutionally embedded process rather than as an individual behavioural intention. In this study, performance expectancy is not only a question of perceived usefulness, but of how usefulness is defined differently by actors with different responsibilities. Similarly, facilitating conditions extend beyond technical and organisational support to include governance capacity, regulatory clarity, procurement structures, spatial conditions, and alignment between institutional logics. Rather than replacing governance theory, the adapted UTAUT framework provides a structure for analysing how usefulness, legitimacy, institutional readiness, and perceived safety are interpreted across actor groups.

6.3 Towards Multi-Level Implementation of Autonomous Public Transport

The findings of this study suggest that the implementation of autonomous public transport is fundamentally shaped by multi-level governance conditions, rather than technological readiness alone. A key implication is that large-scale deployment of autonomous vehicles is unlikely to emerge from municipal initiatives in isolation but instead requires coordination and development at the regional level. In the Swedish context, this places actors such as Västtrafik in a central role in driving long-term transitions towards automation.

The study highlights that regional-scale implementation is currently constrained by regulatory uncertainty, long procurement periods, market immaturity, and limited production volumes. In addition, long-term procurement structures create significant institutional rigidity and path dependency. Addressing these barriers requires clearer regulatory frameworks, greater flexibility in procurement structures, and coordinated efforts to stimulate demand and investment. This may involve collaborative approaches across regions or countries, where resources and risks are shared to support the scaling of autonomous technologies.

However, the findings also demonstrate that municipalities can play an important role in earlier stages of implementation. While large-scale systems depend on regional coordination, there is significant potential for small-scale, locally embedded applications of autonomous transport, such as city-centre shuttles. These smaller interventions can address specific mobility gaps, particularly related to first- and last-mile connectivity and fragmented urban structures, as illustrated in the case of Partille.

Importantly, such local initiatives may serve not only as mobility solutions, but also as socio-technical learning environments. By introducing autonomous transport in controlled and context-specific settings,

municipalities can contribute to building knowledge, familiarity, and public trust, which are identified in this study as critical conditions for broader acceptance. Furthermore, such initiatives may also contribute to market development by creating demand, supporting learning, and signalling future investment needs. However, smaller municipalities often lack the financial resources, technical expertise, and organisational capacity required to initiate and sustain such projects independently. This illustrates a need for supportive frameworks at regional, national, or even international levels, where knowledge, funding, and institutional capacity can be shared to facilitate implementation.

Finally, an important implication of the findings is the need to avoid treating autonomous transport as entirely separate from existing public transport planning logics. The results indicate a tendency among actors to analyse and problematise operational aspects in ways that may unintentionally make implementation appear more complex than necessary. However, insights from the interviews suggest that autonomous public transport does not necessarily differ fundamentally from conventional public transport services in terms of route design, service provision, and operational decision-making. Rather, the autonomous nature of the vehicle creates new opportunities to extend and enhance public transport services. The fact that the vehicle is automated rather than manually driven is therefore not in itself the decisive planning challenge. This highlights the importance of framing autonomous transport not as a radically different system, but as an incremental development within existing public transport planning practices.

Taken together, the findings suggest that the transition towards autonomous public transport should be understood as a gradual and multi-scalar process. While regional actors are central for system-wide implementation, local initiatives can play a complementary role in shaping acceptance, testing applications, and contributing to the long-term development of the technology.

6.4 Limitations and Future Research

As discussed in the methodology chapter, this study is based on a single case study and a limited number of interviews and survey responses. The findings should therefore be understood as context-sensitive and shaped by the specific governance structures, spatial conditions, and actor perspectives present in Partille. The aim has not been to produce broadly generalisable conclusions, but to develop an in-depth understanding of how autonomous public transport is interpreted and negotiated within a concrete municipal planning context. In this sense, the value of the study lies in its analytical depth and its ability to identify patterns and tensions that may also be relevant for comparable municipalities and regions.

A further limitation is that the study examines perceptions of an emerging and partly hypothetical technology. As autonomous public transport continues to develop, and as pilot projects move closer to regular operation, both institutional conditions and public attitudes are likely to change. The findings therefore capture a specific moment characterised by uncertainty, limited real-world experience, and ongoing experimentation.

Future research could investigate how actor perspectives and implementation conditions develop over time, particularly in contexts where autonomous transport moves beyond pilot projects into regular public transport operations. Longitudinal studies would be especially valuable for understanding how trust, perceived safety, and acceptance are shaped through actual use rather than hypothetical scenarios.

There is also a need for further research on how governance arrangements can support coordination across actors and scales, particularly regarding the division of responsibilities between municipalities and regional public transport authorities. In addition, future studies could explore how perceived safety can be operationalised and addressed within planning and design processes, especially in complex urban environments where autonomous systems interact with pedestrians, cyclists, and other road users.

6.5 Conclusion

This thesis has examined how autonomous public transport is interpreted and evaluated as a potential mobility solution within a municipal planning context. Through the case of a possible autonomous city-centre shuttle in Partille, the study shows that autonomous buses are generally understood as complementary to existing public transport, particularly in relation to first- and last-mile connectivity, internal accessibility, and fragmented urban environments.

The study's main contribution is to show that implementation is shaped not only by technological readiness or individual acceptance, but by the alignment of actor perspectives, institutional responsibilities, and governance conditions. It also shows how UTAUT can be used as a planning-oriented framework for analysing acceptance as institutionally embedded. Autonomous public transport is interpreted differently across actor groups: as an efficiency measure, a spatial planning tool, an economic enabler, and a potential trust and safety challenge. These interpretations form part of the implementation conditions themselves.

The findings therefore suggest that autonomous public transport should be understood as a gradual and multi-scalar transition rather than a single technological intervention. Large-scale deployment is likely to depend on regional coordination, regulatory clarity, procurement flexibility, and market development. At the same time, municipalities can play an important role through small-scale, locally embedded applications that address specific mobility gaps and function as socio-technical learning environments.

In the case of Partille, this means that an autonomous shuttle may be meaningful as a local accessibility measure connecting fragmented centre destinations, but its implementation would still depend on regional coordination, regulatory clarity, and institutional support beyond the municipality itself.

Overall, the thesis argues that planning for autonomous public transport requires more than assessing whether the technology works. It also requires understanding how the technology is positioned within existing mobility systems, how responsibilities are distributed, and how trust and implementation capacity are built over time.

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Appendices

Appendix A – Interview Guide (Original Swedish)

Kommunala tjänstemän

Studien handlar om hur autonoma bussar uppfattas som en möjlig mobilitetslösning i stadsmiljö. Syftet är att förstå olika aktörers/yrkesrollers perspektiv på möjligheter, utmaningar och planeringsförutsättningar.

Intervjun tar cirka 30–45 minuter och spelas in med ditt godkännande. Deltagandet är frivilligt och du kan avbryta när som helst.

Tveka inte att fråga om du undrar något eller om något begrepp är otydligt.

Har du några frågor innan vi börjar?

Table A.1. Interview guide original (Municipal)

Nr	Fråga
Nuläge och kontext	
1.	Kan du beskriva din roll och hur den relaterar till centrumutveckling och/eller kollektivtrafik?
2.	Hur fungerar mobiliteten idag i den centrummiljö där en möjlig centrumskyttel skulle kunna gå? - <i>Hur ser du på mobilitetens roll i relation till kommunens övergripande mål?</i>
3.	Vilka delar av mobilitetssystemet i centrum fungerar bra respektive mindre bra?
4.	Finns det grupper som idag har svårare att ta sig fram i centrum?
5.	Hur ser du på behovet av att utveckla mobiliteten i centrum framöver?
Första reaktion på autonom skyttel	
Jag kommer nu att visa en illustrativ bild av en möjlig situation med en självkörande buss i en centrummiljö.	
6.	När du hör “självkörande buss i centrum” och ser den här bilden, vad är din spontana reaktion? - <i>Positiva eller negativa känslor?</i>
7.	Vilken roll tänker du att en autonom skyttelbuss skulle kunna ha i centrummiljön, om någon?
Förväntad nytta (Performance expectancy)	
8.	På vilka sätt, om några, skulle en autonom skyttel kunna bidra till kommunen eller centrummiljön? - <i>Vad är den största/viktigaste nyttan?</i>
9.	Finns det grupper som du tror skulle påverkas särskilt av en sådan lösning? - <i>Positivt/Negativt</i> - <i>Hur linjerar det med kommunens mål och prioriteringar?</i>
Förståelse och komplexitet (Effort expectancy)	
10.	Hur tror du att resenärer skulle förstå och förhålla sig till en sådan lösning i stadsmiljö?

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- *Vad händer första gången en invånare möter en självkörande buss i centrum för första gången?*
11. I situationer där många trafikanter rör sig samtidigt - vad tror du blir särskilt viktigt för att en sådan buss ska fungera?
- Social påverkan och tillit (Social influence)**
12. Vem eller vilka tror du att invånare litar mest på när det gäller information och beslut om en sådan lösning?
13. Hur kan kommunens roll påverka tilliten till en sådan lösning?
14. Hur tror du att människors uppfattningar kan påverkas av att få se eller uppleva systemet i verkligheten?
- Genomförbarhet & planeringsvillkor (Facilitating conditions)**
15. Om kommunen skulle vilja införa en sådan lösning, vad tänker du först att man skulle behöva lösa eller ha på plats?
- *Fysisk miljö, infrastruktur, organisation, samverkan, resurser, bättre teknik, bra exempel från andra platser, etc.*
16. Hur ser förutsättningarna ut idag?
17. Ser du att införandet av en sådan teknik kan påverka hur staden planeras? I så fall hur?
18. När ni planerar nya områden, hur mycket tänker ni på framtida mobilitetslösningar?
19. Hur vill kommunen vara med och påverka/styra en eventuell utrullning av autonoma fordon?
20. Hur tror andra intressenter/aktörer i planarbeten ställer sig till en självkörande skyttel som går genom/intill planområdet?
- *Vad ser de för möjligheter/utmaningar? (Reducera P-tal? Säljvärde? Krångligt?)*
- Upplevd säkerhet (Perceived safety)**
21. Hur tror du att invånare skulle uppleva tryggheten i närheten av en självkörande buss?
22. Vad tror du påverkar människors upplevelse av trygghet i relation till en självkörande buss?
23. Finns det specifika stadssituationer där säkerhetsupplevelsen kan bli mer problematisk?
24. Hur skiljer sig detta från säkerhetsupplevelsen kring en vanlig buss med förare?
25. Vad kan kommunen göra för att påverka den upplevda tryggheten?
- Planeringsperspektiv och framtid**
26. Hur ser du på autonoma bussar i relation till samhällsplanering?
- *Skulle du främst se det som en teknisk lösning, en planeringsfråga som påverkar stadens utformning, eller något annat?*
27. Hur kan en sådan lösning påverka stadens utveckling på längre sikt?
28. Finns det något vi inte har pratat om som du tycker är viktigt i denna fråga?
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Regional aktör (VGR/Västtrafik)

Studien handlar om hur autonoma bussar uppfattas som en möjlig mobilitetslösning i stadsmiljö. Syftet är att förstå olika aktörers/yrkesrollers perspektiv på möjligheter, utmaningar och planeringsförutsättningar.

Intervjun tar cirka 30–45 minuter och spelas in med ditt godkännande. Deltagandet är frivilligt och du kan avbryta när som helst.

Tveka inte att fråga om du undrar något eller om något begrepp är otydligt.

Har du några frågor innan vi börjar?

Table A.2. Interview guide original (Region)

Nr	Fråga
Nuläge och kontext	
1.	Kan du beskriva din roll och hur den relaterar till centrumutveckling och/eller kollektivtrafik?
2.	Utifrån din erfarenhet, hur fungerar mobiliteten i mindre stadskärnor som Partille när det gäller kopplingen mellan lokal rörelse och regional kollektivtrafik?
3.	Hur fungerar samspelet mellan lokal stadsmiljö och det regionala kollektivtrafiksystemet idag? - <i>First-/Last-mile, kombinationsresor</i>
4.	Ser du behov av nya typer av lösningar för att komplettera befintlig kollektivtrafik i centrummiljöer?
Första reaktion på autonom skyttel	
Jag kommer nu att visa en illustrativ bild av en möjlig situation med en självkörande buss i en centrummiljö.	
5.	När du hör “självkörande buss i centrum” och ser den här bilden, vad är din spontana reaktion? - <i>Positiva eller negativa känslor?</i>
6.	Vilken roll tänker du att en autonom skyttelbuss skulle kunna ha i centrummiljön, om någon?
Förväntad nytta (Performance expectancy)	
7.	Hur tror du att en sådan lösning skulle påverka hur kollektivtrafiksystemet fungerar i praktiken? - <i>Vad är den största/viktigaste nyttan?</i>
8.	Finns det grupper som du tror skulle påverkas särskilt av en sådan lösning? - <i>Positivt/Negativt</i>
Förståelse och komplexitet (Effort expectancy)	
9.	Hur tror du att resenärer skulle förstå och förhålla sig till en sådan lösning i stadsmiljö? - <i>Vad händer första gången en invånare möter en självkörande buss i centrum för första gången?</i>
10.	I situationer där många trafikanter rör sig samtidigt - vad tror du blir särskilt viktigt för att en sådan buss ska fungera?
Social påverkan och tillit (Social influence)	

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11. Vem eller vilka tror du att invånare litar mest på när det gäller information och beslut om en sådan lösning?
 12. Hur kan regionens/Västrafiks roll påverka tilliten till en sådan lösning?
 13. Hur tror du att människors uppfattningar kan påverkas av att få se eller uppleva systemet i verkligheten?

Genomförbarhet & systemintegration (Facilitating conditions)

14. Vilka förutsättningar behöver vara uppfyllda för att en sådan lösning ska kunna fungera som del av kollektivtrafiksystemet?
 - *Fysisk miljö, infrastruktur, organisation, samverkan, resurser, bättre teknik, bra exempel från andra platser, etc.*
15. Hur ser du på ansvarsfördelning om något skulle hända i en komplex stadssituation?
16. Finns det organisatoriska eller tekniska hinder som du ser som särskilt viktiga?
17. Hur ser du på resurseffektivitet och prioriteringar i relation till en sådan lösning?
 - *Skulle det vara lönsamt? Kort och lång sikt*
18. Inkluderas flera aktörer i ett sånt här projekt?
 - *Vad är viktigt då? Vilka behövs?*
19. Hur ser du på finansiering av autonoma fordon (tester, piloter ex.)?

Upplevd säkerhet (Perceived safety)

20. Hur tror du att invånare skulle uppleva tryggheten i närheten av en självkörande buss?
21. Vad tror du påverkar människors upplevelse av trygghet i relation till en självkörande buss?
22. Finns det specifika stadssituationer där säkerhetsupplevelsen kan bli mer problematisk?
23. Hur skiljer sig detta från säkerhetsupplevelsen kring en vanlig buss med förare?
24. Vad kan man göra för att påverka den upplevda tryggheten?

Systemperspektiv och framtid

25. Tror du att införandet av sådana lösningar på sikt kan förändra hur kollektivtrafiksystemet planeras och organiseras? I så fall hur?
 26. Hur kan en sådan lösning påverka hur kollektivtrafik planeras i stadsmiljöer på sikt?
 27. Finns det något vi inte har pratat om som du tycker är viktigt i denna fråga?
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Näringsliv

Studien handlar om hur autonoma bussar uppfattas som en möjlig mobilitetslösning i stadsmiljö. Syftet är att förstå olika aktörers/yrkesrollers perspektiv på möjligheter, utmaningar och planeringsförutsättningar.

Intervjun tar cirka 30–45 minuter och spelas in med ditt godkännande. Deltagandet är frivilligt och du kan avbryta när som helst.

Tveka inte att fråga om du undrar något eller om något begrepp är otydligt.

Har du några frågor innan vi börjar?

Table A.3. Interview guide original (Business development department)

Nr	Fråga
Nuläge och kontext	
1.	Kan du beskriva din roll och hur den relaterar till centrumutveckling och/eller kollektivtrafik?
2.	Hur ser du på sambandet mellan mobilitet och centrumets attraktivitet idag? - <i>Finns det vissa transportsätt som verksamheter efterfrågar?</i> - <i>Hur ser de på vad som behövs för att kunder ska kunna ta sig till deras verksamhet?</i>
3.	Finns det grupper av besökare eller kunder som har svårare att ta sig till eller röra sig i centrum?
4.	Ser du behov av nya typer av lösningar för att komplettera befintlig kollektivtrafik i centrummiljöer?
Första reaktion på autonom skyttel	
Jag kommer nu att visa en illustrativ bild av en möjlig situation med en självkörande buss i en centrummiljö.	
5.	När du hör “självkörande buss i centrum” och ser den här bilden, vad är din spontana reaktion? - <i>Positiva eller negativa känslor?</i>
6.	Vilken roll tänker du att en autonom skyttelbuss skulle kunna ha i centrummiljön, om någon?
Förväntad nytta (Performance expectancy)	
7.	På vilka sätt, om några, skulle en autonom skyttel kunna bidra till kommunen eller centrummiljön?
8.	Skulle en sådan lösning kunna påverka hur människor använder centrum?
9.	Tror ni att olika verksamheter skulle påverkas på olika sätt? Finns det verksamheter som skulle gynnas mer eller mindre?
Förståelse och komplexitet (Effort expectancy)	
10.	Hur tror du att resenärer skulle förstå och förhålla sig till en sådan lösning i stadsmiljö? - <i>Vad händer första gången en invånare möter en självkörande buss i centrum för första gången?</i>
11.	Hur tror du att människors förståelse för hur en sådan lösning fungerar kan påverka hur centrum upplevs? - <i>Tror ni att osäkerhet kring hur tekniken fungerar kan påverka hur människor rör sig i centrum?</i>

Social påverkan och tillit (Social influence)

- 12. Vem eller vilka tror du att invånare litar mest på när det gäller information och beslut om en sådan lösning?
- 13. Hur kan regionens/Västtrafiks roll påverka tilliten till en sådan lösning?
- 14. Hur tror du att människors uppfattningar kan påverkas av att få se eller uppleva systemet i verkligheten?

Genomförbarhet & förutsättningar (Facilitating conditions)

- 15. Hur tror ni att verksamheter i centrum skulle reagera på eller se på en sådan här lösning?
- 16. Vem eller vilka tror du att verksamheter litar mest på när det gäller information och beslut om en sådan lösning?

Upplevd säkerhet (Perceived safety)

- 17. Hur tror du att invånare skulle uppleva tryggheten i närheten av en självkörande buss?
- 18. Hur tror du verksamheter skulle uppleva tryggheten med en självkörande buss i närheten av deras verksamhet?
- 19. Hur skiljer sig detta från säkerhetsupplevelsen kring en vanlig buss med förare?

Centrum och framtid

- 20. Vad tänker du skulle vara den viktigaste nyttan med en sådan här lösning i centrum?
 - 21. Hur skulle en sådan lösning kunna påverka centrumets attraktivitet på längre sikt?
 - 22. Finns det något vi inte har pratat om som du tycker är viktigt i denna fråga?
-

Kommunpolitiker

Studien handlar om hur autonoma bussar uppfattas som en möjlig mobilitetslösning i stadsmiljö. Syftet är att förstå olika aktörers/yrkesrollers perspektiv på möjligheter, utmaningar och planeringsförutsättningar.

Intervjun tar cirka 30–45 minuter och spelas in med ditt godkännande. Deltagandet är frivilligt och du kan avbryta när som helst.

Tveka inte att fråga om du undrar något eller om något begrepp är otydligt.

Har du några frågor innan vi börjar?

Table A.4. Interview guide original (Politicians)

Nr	Fråga
Nuläge och kontext	
1.	Kan du beskriva din roll och hur den relaterar till centrumutveckling och/eller kollektivtrafik?
2.	Hur fungerar mobiliteten idag i den centrummiljö där en möjlig centrumskyttel skulle kunna gå? - <i>Hur ser du på mobilitetens roll i relation till kommunens övergripande mål?</i>
3.	Vilka delar av mobilitetssystemet i centrum fungerar bra respektive mindre bra?
4.	Finns det grupper som idag har svårare att ta sig fram i centrum?
5.	Hur ser du på behovet av att utveckla mobiliteten i centrum framöver?
Första reaktion på autonom skyttel	
Jag kommer nu att visa en illustrativ bild av en möjlig situation med en självkörande buss i en centrummiljö.	
6.	När du hör “självkörande buss i centrum” och ser den här bilden, vad är din spontana reaktion? - <i>Positiva eller negativa känslor?</i>
7.	Vilken roll tänker du att en autonom skyttelbuss skulle kunna ha i centrummiljön, om någon?
Förväntad nytta (Performance expectancy)	
8.	På vilka sätt, om några, skulle en autonom skyttel kunna bidra till kommunens mål eller politiska prioriteringar? - <i>Vad är den största/viktigaste nyttan?</i>
9.	Finns det grupper som du tror skulle påverkas särskilt av en sådan lösning? - <i>Positivt/Negativt</i>
Förståelse och komplexitet (Effort expectancy)	
10.	Hur tror du att resenärer skulle förstå och förhålla sig till en sådan lösning i stadsmiljö? - <i>Vad händer första gången en invånare möter en självkörande buss i centrum för första gången?</i>
11.	I situationer där många trafikanter rör sig samtidigt - vad tror du blir särskilt viktigt för att en sådan buss ska fungera?

Social påverkan och tillit (Social influence)

12. Vem eller vilka tror du att invånare litar mest på när det gäller information och beslut om en sådan lösning?
13. Hur tror du att människors uppfattningar kan påverkas av att få se eller uppleva systemet i verkligheten?

- *T.ex. genom pilot-projekt.*

Genomförbarhet & ansvar (Facilitating conditions)

14. Om kommunen skulle vilja införa en sådan lösning, vad tänker du först att man skulle behöva lösa eller ha på plats?
- *Fysisk miljö, infrastruktur, organisation, samverkan, resurser, bättre teknik, bra exempel från andra platser, etc.*
15. Hur tänker du kring ansvar och roller om något oväntat skulle hända?
16. Finns det faktorer som skulle kunna göra dig mer eller mindre benägen att stödja en implementering av självkörande fordon?

Upplevd säkerhet (Perceived safety)

17. Hur tror du att invånare skulle uppleva tryggheten i närheten av en självkörande buss?
18. Vad tror du påverkar människors upplevelse av trygghet i relation till en självkörande buss?
19. Finns det specifika stadssituationer där säkerhetsupplevelsen kan bli mer problematisk?
20. Hur skiljer sig detta från säkerhetsupplevelsen kring en vanlig buss med förare?

Politik och framtid

21. Hur påverkar riskbedömning och osäkerhet viljan att fatta beslut om ny teknik?
22. Hur kan en sådan lösning påverka stadens utveckling på längre sikt?
23. Finns det aspekter av frågan som du tror kan bli politiskt kontroversiella/känsliga?
24. Finns det något vi inte har pratat om som du tycker är viktigt i denna fråga?
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Operatör

Studien handlar om hur autonoma bussar uppfattas som en möjlig mobilitetslösning i stadsmiljö. Syftet är att förstå olika aktörers/yrkesrollers perspektiv på möjligheter, utmaningar och planeringsförutsättningar.

Intervjun tar cirka 30–45 minuter och spelas in med ditt godkännande. Deltagandet är frivilligt och du kan avbryta när som helst.

Tveka inte att fråga om du undrar något eller om något begrepp är otydligt.

Har du några frågor innan vi börjar?

Table A.5. Interview guide original (Operator)

Nr	Fråga
Nuläge och kontext	
1.	Kan du beskriva din roll och hur den relaterar till centrumutveckling och/eller kollektivtrafik?
2.	Utifrån din erfarenhet, hur fungerar mobiliteten i mindre stadskärnor som Partille när det gäller kopplingen mellan lokal rörelse och regional kollektivtrafik
3.	Hur fungerar samspelet mellan lokal stadsmiljö och det regionala kollektivtrafiksystemet idag? - <i>First-/Last-mile, kombinationsresor</i>
4.	Ser du behov av nya typer av lösningar för att komplettera befintlig kollektivtrafik i centrummiljöer?
Första reaktion på autonom skyttel	
Jag kommer nu att visa en illustrativ bild av en möjlig situation med en självkörande buss i en centrummiljö.	
5.	När du hör “självkörande buss i centrum” och ser den här bilden, vad är din spontana reaktion? - <i>Positiva eller negativa känslor?</i>
6.	Vilken roll tänker du att en autonom skyttelbuss skulle kunna ha i centrummiljön, om någon?
Förväntad nytta (Performance expectancy)	
7.	Hur tror du att en sådan lösning skulle påverka hur kollektivtrafiksystemet fungerar i praktiken? - <i>Vad är den största/viktigaste nyttan?</i>
8.	Finns det typer av resor eller miljöer där du tror att en sådan lösning fungerar bättre än andra
Förståelse och komplexitet (Effort expectancy)	
9.	Hur tror du att resenärer skulle förstå och förhålla sig till en sådan lösning i stadsmiljö? - <i>Vad händer första gången en invånare möter en självkörande buss i centrum för första gången?</i>
10.	I situationer där många trafikanter rör sig samtidigt - vad tror du blir särskilt viktigt för att en sådan buss ska fungera?
Social påverkan och tillit (Social influence)	

-
11. Vem eller vilka tror du att invånare litar mest på när det gäller information och beslut om en sådan lösning?
 12. Hur kan man påverka tilliten till en sådan lösning?
 13. Hur tror du att människors uppfattningar kan påverkas av att få se eller uppleva systemet i verkligheten?

Genomförbarhet & systemintegration (Facilitating conditions)

14. Vilka förutsättningar behöver vara uppfyllda för att en sådan lösning ska kunna fungera som del av kollektivtrafiksystemet?
 - *Fysisk miljö, infrastruktur, organisation, samverkan, resurser, bättre teknik, bra exempel från andra platser, etc.*
15. Hur ser du på ansvarsfördelning om något skulle hända i en komplex stadssituation?
16. Finns det organisatoriska eller tekniska hinder som du ser som särskilt viktiga?
17. Hur ser du på resurseffektivitet och prioriteringar i relation till en sådan lösning?
 - *Skulle det vara lönsamt? Kort och lång sikt*
18. Inkluderas flera aktörer i ett sånt här projekt?
 - *Vad är viktigt då? Vilka behövs?*
19. Hur ser du på finansiering av autonoma fordon (tester, piloter ex.)?

Upplevd säkerhet (Perceived safety)

20. Hur tror du att invånare skulle uppleva tryggheten i närheten av en självkörande buss?
21. Vad tror du påverkar människors upplevelse av trygghet i relation till en självkörande buss?
22. Finns det specifika stadssituationer där säkerhetsupplevelsen kan bli mer problematisk?
23. Hur skiljer sig detta från säkerhetsupplevelsen kring en vanlig buss med förare?
24. Vad kan man göra för att påverka den upplevda tryggheten?

Systemperspektiv och framtid

25. Hur ser du på utvecklingen av autonoma bussar i kollektivtrafiken framöver?
 26. Finns det något i frågan om autonoma bussar som du ser som särskilt strategiskt viktigt framöver?
 27. Finns det något vi inte har pratat om som du tycker är viktigt i denna fråga?
-

Appendix B – Interview Guide (English Translation)

Municipal Officials

This study explores how autonomous buses are perceived as a potential mobility solution in urban environments. The aim is to understand how different actors and professional roles perceive opportunities, challenges, and planning conditions.

The interview will take approximately 30–45 minutes and will be recorded with your consent. Participation is voluntary, and you may withdraw at any time.

Please do not hesitate to ask if anything is unclear.

Do you have any questions before we begin?

Table B.1. Interview guide translated (Municipal)

No.	Question
Current Situation and Context	
1.	Can you describe your role and how it relates to city centre development and/or public transport?
2.	How does mobility currently function in the city centre where a potential shuttle could operate? - <i>How do you view the role of mobility in relation to the municipality's overall goals?</i>
3.	Which parts of the mobility system in the city centre work well, and which do not?
4.	Are there groups that currently have greater difficulty moving around the city centre?
5.	How do you perceive the need to develop mobility in the city centre going forward?
Initial Reaction to Autonomous Shuttle	
You will now be shown an illustrative image of a possible scenario involving an autonomous bus in a city centre environment.	
6.	When you hear “autonomous bus in the city centre” and see this image, what is your immediate reaction? - <i>Positive or negative feelings?</i>
7.	What role do you think an autonomous shuttle could have in the city centre, if any?
Expected Benefits (Performance Expectancy)	
8.	In what ways, if any, could an autonomous shuttle contribute to the municipality or the city centre? - <i>What would be the most important benefit?</i>
9.	Are there specific groups that you think would be particularly affected by such a solution? - <i>Positively/negatively</i> - <i>How does this align with municipal goals and priorities?</i>
Understanding and Complexity (Effort Expectancy)	
10.	How do you think travellers would understand and relate to such a solution in an urban environment? - <i>What happens the first time a resident encounters an autonomous bus in the city centre?</i>

-
11. In situations where many road users are present at the same time, what do you think is particularly important for such a bus to function effectively?
- Social Influence and Trust (Social Influence)**
12. Who do you think residents trust the most when it comes to information and decisions about such a solution?
13. How can the municipality's role influence trust in such a solution?
14. How do you think people's perceptions might change if they see or experience the system in real life?
- Implementation Conditions and Planning Context (Facilitating Conditions)**
15. If the municipality were to implement such a solution, what do you think would need to be in place first?
- *Physical environment, infrastructure, organisation, collaboration, resources, improved technology, examples from other cities, etc.*
16. What are the current conditions like?
17. Do you think the introduction of such technology could influence how cities are planned? If so, how?
18. When planning new areas, to what extent do you consider future mobility solutions?
19. How would the municipality want to influence or guide a potential rollout of autonomous vehicles?
20. How do you think other stakeholders in planning processes would respond to an autonomous shuttle operating in or near a development area?
- *What opportunities or challenges might they see? (e.g. reduced parking requirements, increased attractiveness, complexity?)*
- Perceived Safety**
21. How do you think residents would perceive safety in the presence of an autonomous bus?
22. What do you think influences people's perception of safety in relation to autonomous buses?
23. Are there specific urban situations where perceived safety may become more problematic?
24. How does this differ from perceptions of safety around a conventional bus with a driver?
25. What can the municipality do to influence perceived safety?
- Planning Perspective and Future**
26. How do you view autonomous buses in relation to spatial planning?
- *Would you primarily see it as a technical solution, a planning issue affecting urban form, or something else?*
27. How could such a solution influence urban development in the long term?
28. Is there anything we have not discussed that you consider important in this context?
-

Regional Actor (VGR / Västtrafik)

This study explores how autonomous buses are perceived as a potential mobility solution in urban environments. The aim is to understand how different actors and professional roles perceive opportunities, challenges, and planning conditions.

The interview will take approximately 30–45 minutes and will be recorded with your consent. Participation is voluntary, and you may withdraw at any time.

Please do not hesitate to ask if anything is unclear.

Do you have any questions before we begin?

Table B.2. Interview guide translated (Region)

No.	Question
Current Situation and Context	
1.	Can you describe your role and how it relates to city centre development and/or public transport?
2.	Based on your experience, how does mobility function in smaller urban centres such as Partille in terms of the connection between local movement and regional public transport?
3.	How does the interaction between the local urban environment and the regional public transport system function today? - <i>First-/Last-mile, multimodal trips</i>
4.	Do you see a need for new types of solutions to complement existing public transport in city centre environments?
Initial Reaction to Autonomous Shuttle	
You will now be shown an illustrative image of a possible scenario involving an autonomous bus in a city centre environment.	
5.	When you hear “autonomous bus in the city centre” and see this image, what is your immediate reaction? - <i>Positive or negative feelings?</i>
6.	What role do you think an autonomous shuttle could have in the city centre, if any?
Expected Benefits (Performance Expectancy)	
7.	How do you think such a solution would affect how the public transport system functions in practice? - <i>What would be the most important benefit?</i>
8.	Are there specific groups that you think would be particularly affected by such a solution? - <i>Positively/negatively</i>
Understanding and Complexity (Effort Expectancy)	
9.	How do you think travellers would understand and relate to such a solution in an urban environment? - <i>What happens the first time a resident encounters an autonomous bus in the city centre?</i>

-
10. In situations where many road users are present at the same time, what do you think is particularly important for such a bus to function effectively?
- Social Influence and Trust (Social influence)**
11. Who do you think residents trust the most when it comes to information and decisions about such a solution?
12. How can the role of the region/Västtrafik influence trust in such a solution?
13. How do you think people's perceptions might change if they see or experience the system in real life?
- Implementation and System Integration (Facilitating Conditions)**
14. What conditions need to be in place for such a solution to function as part of the public transport system?
- *Physical environment, infrastructure, organisation, collaboration, resources, improved technology, examples from other contexts, etc.*
15. How do you view the distribution of responsibility if something were to happen in a complex urban situation?
16. Are there organisational or technical barriers that you see as particularly important?
17. How do you view resource efficiency and prioritisation in relation to such a solution?
- *Would it be economically viable? Short and long term*
18. Are multiple actors involved in such a project?
- *What is important in that case? Who needs to be involved?*
19. How do you view the financing of autonomous vehicles (e.g. pilots, test projects)?
- Perceived Safety**
20. How do you think residents would perceive safety in the presence of an autonomous bus?
21. What do you think influences people's perception of safety in relation to autonomous buses?
22. Are there specific urban situations where perceived safety may become more problematic?
23. How does this differ from perceptions of safety around a conventional bus with a driver?
24. What can be done to influence perceived safety?
- System Perspective and Future**
25. Do you think that the introduction of such solutions could change how public transport systems are planned and organised in the long term? If so, how?
26. How could such a solution influence how public transport is planned in urban environments over time?
27. Is there anything we have not discussed that you consider important in this context?
-

Business Sector

This study explores how autonomous buses are perceived as a potential mobility solution in urban environments. The aim is to understand how different actors and professional roles perceive opportunities, challenges, and planning conditions.

The interview will take approximately 30–45 minutes and will be recorded with your consent. Participation is voluntary, and you may withdraw at any time.

Please do not hesitate to ask if anything is unclear.

Do you have any questions before we begin?

Table B.3. Interview guide translated (Business development department)

No.	Question
Current Situation and Context	
1.	Can you describe your role and how it relates to city centre development and/or public transport?
2.	How do you view the relationship between mobility and the attractiveness of the city centre today? - <i>Are there particular modes of transport that businesses demand?</i> - <i>What do they consider necessary for customers to access their services?</i>
3.	Are there groups of visitors or customers who have greater difficulty accessing or moving within the city centre?
4.	Do you see a need for new types of solutions to complement existing public transport in city centre environments?
Initial Reaction to Autonomous Shuttle	
You will now be shown an illustrative image of a possible scenario involving an autonomous bus in a city centre environment.	
5.	When you hear “autonomous bus in the city centre” and see this image, what is your immediate reaction? - <i>Positive or negative feelings?</i>
6.	What role do you think an autonomous shuttle could have in the city centre, if any?
Expected Benefits (Performance Expectancy)	
7.	In what ways could an autonomous shuttle contribute to the municipality or city centre?
8.	Could such a solution influence how people use the city centre?
9.	Do you think different types of businesses would be affected differently? Are there businesses that would benefit more or less?
Understanding and Complexity (Effort Expectancy)	
10.	How do you think travellers would understand and relate to such a solution in an urban environment? - <i>What happens the first time a resident encounters an autonomous bus in the city centre?</i>
11.	How could people’s understanding of how the system work influence how the city centre is perceived?

-
- *How could people's understanding of how the system work influence how the city centre is perceived?*

Social Influence and Trust (Social influence)

12. Who do you think residents trust the most regarding information and decisions about such a solution?
13. How could the role of the region/Västtrafik influence trust?
14. How might perceptions change if people experience the system in real life?

Implementation Conditions (Facilitating Conditions)

15. How do you think businesses in the city centre would react to such a solution?
16. Who do you think businesses trust the most when it comes to information and decisions about such a solution?

Perceived Safety

17. How do you think residents would perceive safety around an autonomous bus?
18. How do you think businesses would perceive safety with such a system operating nearby?
19. How does this differ from a conventional bus with a driver?

City Centre and Future

20. What do you think would be the most important benefit of such a solution in the city centre?
21. How could such a solution influence the attractiveness of the city centre in the long term?
22. Is there anything we have not discussed that you consider important?
-

Municipal Politicians

This study explores how autonomous buses are perceived as a potential mobility solution in urban environments. The aim is to understand how different actors and professional roles perceive opportunities, challenges, and planning conditions.

The interview will take approximately 30–45 minutes and will be recorded with your consent. Participation is voluntary, and you may withdraw at any time.

Please do not hesitate to ask if anything is unclear.

Do you have any questions before we begin?

Table B.4. Interview guide translated (Politicians)

No.	Question
Current Situation and Context	
1.	Can you describe your role and how it relates to city centre development and/or public transport?
2.	How does mobility currently function in the city centre where a potential shuttle could operate? - <i>How do you view the role of mobility in relation to the municipality's overall goals?</i>
3.	Which parts of the mobility system in the city centre work well, and which do not?
4.	Are there groups that currently have greater difficulty moving around the city centre?
5.	How do you perceive the need to develop mobility in the city centre going forward?
Initial Reaction to Autonomous Shuttle	
You will now be shown an illustrative image of a possible scenario involving an autonomous bus in a city centre environment.	
6.	When you hear “autonomous bus in the city centre” and see this image, what is your immediate reaction? - <i>Positive or negative feelings?</i>
7.	What role do you think an autonomous shuttle could have in the city centre, if any?
Expected Benefits (Performance Expectancy)	
8.	In what ways, if any, could an autonomous shuttle contribute to municipal goals or political priorities? - • <i>What would be the most important benefit?</i>
9.	Are there specific groups that you think would be particularly affected by such a solution? - <i>Positively/negatively</i>
Understanding and Complexity (Effort Expectancy)	
10.	How do you think travellers would understand and relate to such a solution in an urban environment? - <i>What happens the first time a resident encounters an autonomous bus in the city centre?</i>
11.	In situations where many road users are present at the same time, what do you think is particularly important for such a bus to function effectively?

Social Influence and Trust (Social Influence)

12. Who do you think residents trust the most when it comes to information and decisions about such a solution?
13. How do you think people's perceptions might change if they see or experience the system in real life?
 - *For example, through pilot projects*

Implementation and Responsibility (Facilitating Conditions)

14. If the municipality were to implement such a solution, what do you think would need to be in place first?
 - *Physical environment, infrastructure, organisation, collaboration, resources, improved technology, examples from other cities, etc.*
15. How do you view responsibility and roles if something unexpected were to happen?
16. Are there factors that would make you more or less inclined to support the implementation of autonomous vehicles?

Perceived Safety

17. How do you think residents would perceive safety in the presence of an autonomous bus?
18. What do you think influences people's perception of safety in relation to autonomous buses?
19. Are there specific urban situations where perceived safety may become more problematic?
20. How does this differ from perceptions of safety around a conventional bus with a driver?

Politics and Future

21. How does risk assessment and uncertainty influence the willingness to make decisions about new technology?
 22. How could such a solution influence urban development in the long term?
 23. Are there aspects of this issue that you believe could become politically sensitive or controversial?
 24. Is there anything we have not discussed that you consider important in this context?
-

Operator

This study explores how autonomous buses are perceived as a potential mobility solution in urban environments. The aim is to understand how different actors and professional roles perceive opportunities, challenges, and planning conditions.

The interview will take approximately 30–45 minutes and will be recorded with your consent. Participation is voluntary, and you may withdraw at any time.

Please do not hesitate to ask if anything is unclear.

Do you have any questions before we begin?

Table B.5. Interview guide translated (Operator)

No.	Question
Current Situation and Context	
1.	Can you describe your role and how it relates to city centre development and/or public transport?
2.	Based on your experience, how does mobility function in smaller urban centres such as Partille in terms of the connection between local movement and regional public transport?
3.	How does the interaction between the local urban environment and the regional public transport system function today? - <i>First-/Last-mile, multimodal trips</i>
4.	Do you see a need for new types of solutions to complement existing public transport in city centre environments?
Initial Reaction to Autonomous Shuttle	
You will now be shown an illustrative image of a possible scenario involving an autonomous bus in a city centre environment.	
5.	When you hear “autonomous bus in the city centre” and see this image, what is your immediate reaction? - <i>Positive or negative feelings?</i>
6.	What role do you think an autonomous shuttle could have in the city centre, if any?
Expected Benefits (Performance Expectancy)	
7.	How do you think such a solution would affect how the public transport system functions in practice? - <i>What would be the most important benefit?</i>
8.	Are there types of trips or environments where you think such a solution would function particularly well?
Understanding and Complexity (Effort Expectancy)	
9.	How do you think travellers would understand and relate to such a solution in an urban environment? - <i>What happens the first time a resident encounters an autonomous bus in the city centre?</i>

-
10. In situations where many road users are present at the same time, what do you think is particularly important for such a bus to function effectively?
- Social Influence and Trust (Social Influence)**
11. Who do you think residents trust the most when it comes to information and decisions about such a solution?
12. How can trust in such a solution be influenced?
13. How do you think people's perceptions might change if they see or experience the system in real life?
- Implementation and System Integration (Facilitating Conditions)**
14. What conditions need to be in place for such a solution to function as part of the public transport system?
- *Physical environment, infrastructure, organisation, collaboration, resources, improved technology, examples from other contexts, etc.*
15. How do you view the distribution of responsibility if something were to happen in a complex urban situation?
16. Are there organisational or technical barriers that you see as particularly important?
17. How do you view resource efficiency and prioritisation in relation to such a solution?
- *Would it be economically viable? Short and long term*
18. Are multiple actors involved in such a project?
- *What is important in that case? Who needs to be involved?*
19. How do you view the financing of autonomous vehicles (e.g. pilots, test projects)?
- Perceived Safety**
20. How do you think residents would perceive safety in the presence of an autonomous bus?
21. What do you think influences people's perception of safety in relation to autonomous buses?
22. Are there specific urban situations where perceived safety may become more problematic?
23. How does this differ from perceptions of safety around a conventional bus with a driver?
24. What can be done to influence perceived safety?
- System Perspective and Future**
25. How do you view the future development of autonomous buses in public transport?
26. Are there aspects of autonomous buses that you consider strategically important going forward?
27. Is there anything we have not discussed that you consider important in this context?
-

Appendix C – Informed Consent Form



Samtycke till deltagande i examensarbete vid Samhällsvetenskapliga fakulteten

Detta examensarbete genomförs inom ramen för masterprogrammet i
Samhällsgeografi vid Lunds universitet.
Ansvarig student: Tim Solefors

Studien undersöker hur olika aktörer uppfattar autonoma bussar som en möjlig
mobilitetslösning i stadsmiljö.

Intervjun tar cirka 30–45 minuter och spelas in i ljudformat för att möjliggöra
korrekt återgivning och analys.

I uppsatsen kommer deltagare att anonymiseras och refereras till genom generella
yrkesbeteckningar, såsom "kommunal tjänsteperson".

Information om personuppgiftsbehandlingen

I samband med intervjun behandlas följande uppgifter:

- Roll/Titel
- Ljudinspelning av intervjun

Inga känsliga personuppgifter samlas in. Deltagandet är frivilligt och du kan när
som helst avbryta din medverkan utan att ange skäl.

Intervjumaterialet kommer att behandlas på följande sätt:

Ljudinspelningen används enbart för transkribering och analys inom ramen för
examensarbetet. Materialet lagras på ett säkert sätt och delas inte med tredje part.

Efter att examensarbetet har examinerats kommer ljudfilerna att raderas.

Jag har tagit del av informationen ovan och samtycker till att:

- Intervjun spelas in
- Mina uttalanden får användas i examensarbetet

Ort	Underskrift
Datum	Namnförtydligande

Tim Solefors
Masterprogram i Samhällsgeografi
Lunds universitet
E-post: timssolefors@gmail.com

Figure 1. Informed Consent Form

Appendix D – AI-illustration for Interviews and Survey



Figure 2. AI-illustration

Appendix E – Survey Questionnaire (Original Swedish)

Syn på självkörande bussar i stadsmiljö

Denna enkät är en del av en masteruppsats vid Lunds universitet. Studien undersöker hur olika samhällsgrupper uppfattar självkörande bussar i stadsmiljö. Självkörande (autonoma) bussar testas i flera städer och diskuteras som ett möjligt komplement till dagens kollektivtrafik. Denna studie syftar till att förstå hur nyttor, risker och trygghet kopplade till sådana lösningar uppfattas.

Du kan delta oavsett om du har relation till Partille eller inte.

Enkäten är anonym och tar cirka 2–3 minuter att besvara.

Tack för att du tar dig tid att delta!

Table E.1. Survey questionnaire (original)

Del 1		
Nr	Fråga	Svarsalternativ/Skala
1	Ålder	Under 18; 18–29; 30–44; 45–64; 65+; Vill ej uppge
2	Kön	Man; Kvinna; Annat; Vill ej uppge
3	Har du någon relation till Partille kommun?	Jag bor i Partille; Jag arbetar i Partille; Jag besöker Partille regelbundet; Jag besöker Partille ibland; Jag har tidigare bott, arbetat eller haft annan koppling till Partille; Ingen särskild relation. Flera alternativ möjliga.
4	Hur ofta vistas du i stadskärnor eller centrumområden generellt?	Dagligen; Några gånger i veckan; Några gånger i månaden; Mer sällan; Aldrig
5	Hur ofta vistas du i Partille centrum, inklusive arenaområdet?	Dagligen; Några gånger i veckan; Några gånger i månaden; Mer sällan; Aldrig
6	Vilka färdssätt använder du främst när du vistas i centrumområden? Välj högst två alternativ.	Går; Cykel, inklusive elcykel och elsparkcykel; Kollektivtrafik, till exempel buss eller tåg; Bil, som förare eller passagerare; Övrigt
7	Arbetar eller studerar du inom ett område som rör teknisk innovation, mobilitet eller samhällsplanering?	Ja; Nej; Delvis
8	Hur bekant är du med självkörande fordon, till exempel självkörande bussar eller bilar?	Jag har aldrig hört talas om det tidigare; Jag har hört talas om det men vet inte så mycket; Jag har viss kunskap om hur det fungerar; Jag har god kunskap om hur det fungerar

9	Har du åkt i en självkörande buss/skyttel någon gång?	Ja; Nej
10	Använder du själv någon form av förarassistans eller automatiserade funktioner i fordon, till exempel adaptiv farthållare, filhållningsassistans eller parkeringsassistans?	Ja, regelbundet; Ja, ibland; Nej; Har inte körkort / kör inte bil
11	Vilken eller vilka faktorer är viktigast för dig när nya transportlösningar, som självkörande bussar, införs i en stadsmiljö? Välj högst tre alternativ.	Att den upplevs som säker; Att den förbättrar tillgängligheten; Att den är prisvärd för resenären; Att tekniken är väl testad; Att kommunen tar tydligt ansvar för genomförandet; Att den bidrar till minskad miljöpåverkan; Övrigt

Del 2

Nu följer 12 påståenden om självkörande bussar i stadsmiljö. Ange i vilken grad du instämmer i varje påstående utifrån vad du själv tycker.

Bilden nedan visar ett exempel på en självkörande buss i stadsmiljö.

Använd denna situation som utgångspunkt när du besvarar följande påståenden.



Nr	Fråga	Skala
12	Jag känner mig generellt positiv till självkörande bussar.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
13	En sådan lösning skulle förbättra tillgängligheten till service, handel och målpunkter i centrum.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
14	Jag ser en tydlig nytta med självkörande bussar som komplement till vanlig kollektivtrafik.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt

15	Jag tror att det skulle vara svårt att förstå hur man reser med en självkörande buss.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
16	Jag tror att det skulle finnas ett betydande motstånd mot självkörande bussar i stadsmiljö.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
17	Om kommunen inför självkörande bussar skulle jag känna förtroende för beslutet.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
18	Jag uppfattar att tekniken bakom självkörande bussar är säker.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
19	Om många i min omgivning använder självkörande bussar skulle det göra att jag känner mig tryggare att prova.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
20	Jag tror att självkörande bussar kan fungera i stadsmiljö där det finns gående, cyklister och annan trafik.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
21	Det känns realistiskt att en kommun skulle kunna införa en sådan lösning under de kommande 10 åren.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
22	Jag skulle känna mig trygg med att åka i en buss utan en förare.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
23	Jag skulle känna mig trygg med att gå eller cykla nära en självkörande buss.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt
24	Jag skulle känna större oro för säkerheten i en självkörande buss än i en vanlig buss.	1–5, där 1 = Instämmer inte alls och 5 = Instämmer helt

Appendix F – Survey Questionnaire (English Translation)

Views on Self-Driving Buses in Urban Environments

This survey is part of a master's thesis at Lund University. The study examines how different social groups perceive self-driving buses in urban environments. Self-driving, or autonomous, buses are being tested in several cities and are discussed as a possible complement to today's public transport. The aim of this study is to understand how benefits, risks, and perceived safety related to such solutions are perceived.

You can participate regardless of whether you have a relation to Partille or not.

The survey is anonymous and takes approximately 2–3 minutes to complete.

Thank you for taking the time to participate!

Table F.1. Survey questionnaire (translated)

Part 1		
No.	Question	Response options
1	Age	Under 18; 18–29; 30–44; 45–64; 65+; Prefer not to say
2	Gender	Man; Woman; Other; Prefer not to say
3	Do you have any relation to Partille municipality?	I live in Partille; I work in Partille; I visit Partille regularly; I visit Partille occasionally; I have previously lived, worked, or had another connection to Partille; No particular relation. Multiple answers possible.
4	How often do you spend time in town centres or central urban areas in general?	Daily; A few times a week; A few times a month; Less often; Never
5	How often do you spend time in Partille centre, including the arena area?	Daily; A few times a week; A few times a month; Less often; Never
6	Which modes of transport do you mainly use when spending time in town centres? Select up to two options.	Walking; Bicycle, including e-bike and e-scooter; Public transport, such as bus or train; Car, as driver or passenger; Other
7	Do you work or study in a field related to technological innovation, mobility, or urban planning?	Yes; No; Partly
8	How familiar are you with self-driving vehicles, such as self-driving buses or cars?	I have never heard of them before; I have heard of them but do not know much; I have some knowledge of how they work; I have good knowledge of how they work

9	Have you ever travelled in a self-driving bus or shuttle?	Yes; No
10	Do you use any form of driver assistance or automated vehicle functions, such as adaptive cruise control, lane-keeping assistance, or parking assistance?	Yes, regularly; Yes, sometimes; No; I do not have a driving licence / I do not drive
11	Which factor or factors are most important to you when new transport solutions, such as self-driving buses, are introduced in an urban environment? Select up to three options.	That it is perceived as safe; That it improves accessibility; That it is affordable for passengers; That the technology is well tested; That the municipality takes clear responsibility for implementation; That it contributes to reduced environmental impact; Other

Part 2

The following section consists of 12 statements about self-driving buses in urban environments. Indicate the extent to which you agree with each statement based on your own opinion.

The image below shows an example of a self-driving bus in an urban environment.

Use this situation as a reference point when responding to the following statements.



No.	Question	Scale
12	I generally feel positive towards self-driving buses.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
13	Such a solution would improve accessibility to services, retail, and destinations in the town centre.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
14	I see clear value in self-driving buses as a complement to regular public transport.	1–5, where 1 = Strongly disagree and 5 = Strongly agree

15	I think it would be difficult to understand how to travel by self-driving bus.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
16	I think there would be significant resistance to self-driving buses in urban environments.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
17	If the municipality introduced self-driving buses, I would trust the decision.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
18	I perceive the technology behind self-driving buses as safe.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
19	If many people around me used self-driving buses, it would make me feel safer trying them.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
20	I think self-driving buses can function in urban environments with pedestrians, cyclists, and other traffic.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
21	It feels realistic that a municipality could introduce such a solution within the next 10 years.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
22	I would feel safe travelling in a bus without a driver.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
23	I would feel safe walking or cycling near a self-driving bus.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
24	I would feel more concerned about safety in a self-driving bus than in a regular bus.	1–5, where 1 = Strongly disagree and 5 = Strongly agree
