



# Unfavorable transit planning: Lack of knowledge, lack of collaboration, or political conflicts? A case study of two Norwegian cities aiming to increase transit competitiveness

Eva-Gurine Skartland<sup>a,b,1,2</sup>

<sup>a</sup> Institute of Transport Economics - Norwegian Centre for Transport Research, Norway

<sup>b</sup> Department of Urban and Regional Planning, Norwegian University of Life Sciences, Norway

## ARTICLE INFO

### Keywords:

Transit competitiveness  
Transport planning  
Land use planning  
Transit planning  
Route structure changes  
Decision making  
Collaboration  
Politics  
Sustainable development

## ABSTRACT

The purpose of this paper is to reveal possible reasons for unfavorable decisions in transit planning that weaken the possibility of increasing transit competitiveness versus the private car. The paper is based upon a qualitative case study of two Norwegian cities that have initiated projects to increase transit competitiveness versus the private car. Interviews and document studies have been conducted and interpreted using existing theories and case studies to determine possible reasons for decisions that are unfavorable for transit competitiveness. In this paper, it is concluded that conflicting politics is the main reason for unfavorable decisions in transit planning. Though the planning practitioners in the transit projects make effort to communicate to the politicians how the conflicting politics are limiting the possibility to increase transit competitiveness versus the private car, this effort has little effect. It is suggested in this work that the role of the urban planner should be extended to not only inform but also awaken a need for more knowledge among politicians and decisionmakers to help prevent unfavorable decisions being made within transit, and urban planning.

## 1. Introduction

The purpose of this paper is to reveal possible reasons for unfavorable decisions in transit planning that weaken the possibility of increasing transit competitiveness versus the private car. In this work, the term *transit competitiveness* should be understood to mean the ability that transit has to compete with the private car and should not be interpreted as an increase in patronage, passengers, or ticket sales. The paper is based upon a case study of two projects seeking to increase transit competitiveness in two Norwegian cities, which consist of strategic changes in the route structure and fall within the field of spatial planning.

Previous case studies on transit planning have found that conflicting measures in master plans reduce the possibility of increasing transit competitiveness (Skartland, 2021), and owing to this, there are clear

limits to what can be achieved even when the transit route structure design and service are in accordance with best-practice recommendations (recommended strategies, measures, and practices for transit planning) (Skartland, Forthcoming). As many cities are aiming to reduce the negative consequences of using the private car and are making large investments in transit, it is important to uncover what lies behind the unfavorable decisions in transit planning (and land-use and transport planning) that reduce the possibility of increasing transit competitiveness.

In Norway, national and local objectives to reduce the use of the private car have triggered the initiation of planning projects meant to contribute to an increase in transit competitiveness (Tønnesen, Krogstad, Christiansen, & Isaksson, 2019). The zero-growth objective, one of the clearest objectives, states that “*In urban areas, greenhouse gas emissions, queues, air pollution and noise will be reduced through efficient land*

E-mail address: [egs@toi.no](mailto:egs@toi.no).

<sup>1</sup> <https://orcid.org/0000-0003-4805-9565>

<sup>2</sup> Twitter: @EvaGurine

<https://doi.org/10.1016/j.progress.2022.100656>

Received 23 June 2021; Received in revised form 2 March 2022; Accepted 3 March 2022

Available online 11 March 2022

0305-9006/© 2022 The Author(s). Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

use and by covering the growth in private transport through public transport, cycling and walking” (Ministry of Transport, 2020). Though I fully acknowledge that walking, cycling, and other mobility investments play an important role in reducing the use of the private car, this work has a deliberate focus on transit competitiveness versus the competitiveness of the private car.<sup>3</sup>

Considering the objectives of increasing transit competitiveness and reducing the use of the private car, it is a concern that the literature shows that many transit projects have variable outcomes. These outcomes could be connected to a lack of knowledge, a lack of collaboration, or political conflicts (McLeod, Scheurer, & Curtis, 2017; Pettersson & Hrelja, 2018; Tennøy, Hansson, Lissandrello, & Næss, 2016; Øksenholt & Tennøy, 2018). There is little research on the reasons for multiple transit projects failing, even when the planners follow best-practice guides, are supported by local political objectives, and make an effort to improve collaboration among stakeholders. A recently published systematic review of the existing research literature on “how to improve the conditions for public transport” (Hrelja, Khan, & Pettersson, 2020:187) reveals the pitfalls limiting the possibility of improving conditions for transit. Several studies have identified difficulties regarding a complex and fragmented governance setting related to transit planning. Such fragmentation has led to difficulties in communicating with decision-makers. In contrast, actors supporting car use and road projects have had it easier not only when it comes to communication but also in terms of funding, because these actors have been more unified than actors working to improve transit. Further, several studies in the review found that the continuous prioritization of the private car and economic growth tends to trump the prioritization of transit and other measures that can contribute to sustainable development. Some of the studies have connected this to “path dependency...and argue that it consists of three elements: physical (dominant forms of transport in the city), organizational (how transport planning and provision is organized) and discursive (the dominant views on problems and solutions in the transport system)” (Hrelja et al., 2020:189). These studies argue that the path of continuous car-friendly development and the structure of the institutions involved lead to car dependency. Additionally, a separate study found path dependency is difficult to break, as it is dependent on decision-makers and other actors “break[ing] with dominant paths” (Hrelja et al., 2020:198).

Hrelja et al.’s (2020) systematic review revealed that many studies point out that challenges related to governance systems and the level of collaboration (or lack thereof) are important when aiming to improve conditions for transit. Because of this, it is pointed out several times in the review that there is a “need for evaluation of outcomes of the working practices in terms of increased travel, punctuality, cancellations, customer satisfaction and costs, etc. Most of the articles describe, as already mentioned, working practices as a step-by-step process, and they focus on the actors’ relationships, negotiations, and behavior” (Hrelja et al., 2020:194). Although this paper will be examining working actors’ practices, there will be a focus on how this behavior is likely to lead to changes in the urban structure (land use, transport, and transit systems) that contributes to the more or less successful outcomes of transit planning projects.

It is crucial to identify the mechanisms that lead to transit project decisions that are unfavorable to the aim of increasing transit competitiveness and why projects that are heavily invested in fail despite national and local objectives aiming to reduce the use of cars and increase transit competitiveness. Is this failure due to a lack of knowledge? Lack

<sup>3</sup> Though the electrical car helps reducing emissions locally as well as to the atmosphere, the use of the electrical cars also has negative side effects such as queues, local air pollution in the form of dust, noise, and the resources production of electrical cars demands, and the negative causal effects of all car use; road expansion and sprawl that leads to threats against biodiversity and soils for agriculture. Not to mention the social barriers and safety issues roads and cars can make in a city environment.

of collaboration? Or are there, despite the current inclusion of climate-friendly objectives in land use and transport plans, political conflicts limiting the possibility of increasing transit competitiveness?

Hrelja et al. (2020) pointed out that “Few articles evaluate the outcome of working practices. This is an obvious weakness” (Hrelja et al., 2020:194). This work is meant to fill the knowledge gaps by illuminating the likely outcome of the working practices in two planning projects that are meant to increase transit competitiveness. This work is based on the findings from a case study on changes made in the transit system in two Norwegian cities: Trondheim (a medium-sized city) and Hamar (a small city). The relevance of this work is international in scale because there are many urban planners working to develop strategies to increase transit competitiveness and to sell this idea to the public and politicians. The spatial characteristics of the case-study cities are also similar to many cities across Europe and beyond.

In this work, the term “sustainable development” is understood as follows:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given, and
- the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.” (WCED, 1987:1)

### 1.1. Purpose and contribution

The negative consequences of traffic growth are harmful to the city environment. Biodiversity and city inhabitants are harmed by pollution in various forms, such as noise, dust, and gas, not to mention the physical barrier function of some roads. To succeed in limiting the use of the private car, building sustainable cities, and fighting the climate crisis, it is crucial to uncover why transit projects have variable outcomes and where and why we are failing; knowing this will enable us to make corrections and continue to work more efficiently toward a better future. If we are investing heavily in measures that are not delivering results, there lies a risk in continuing ruling practice, as if it is the cause of failing projects, it will enhance the notion that investing in transit brings small benefits when aiming to compete with the private car. The contribution of this paper is that it can illuminate the factors that lead to unfavorable decisions in transit planning and can suggest changes in practice that might contribute to a larger chance that transit projects can bring benefits related to increased transit competitiveness and the reduced use of the private car in areas in which this is possible. Such a change might also contribute to politicians and stakeholders getting more value for their money.

## 2. Objective and research questions

There are many strategies that can be implemented to increase transit competitiveness, such as campaigns and ticket pricing, but this work focuses on what can be done through spatial planning. The focus is on route structure changes because they are a known and commonly used strategy within spatial planning to increase transit competitiveness and for other local objectives, such as increasing mobility for the young and elderly. Route structure changes are interesting because they can be strategically implemented to contribute to different types of goals. Nevertheless, achieving local objectives is more likely if land use and transport development are pulling in the same direction (Skartland, 2021, Forthcoming), and the complex causal mechanisms between land

use and transport are interesting both for researchers and for planning practitioners and decision-makers who are seeking to achieve local objectives. As noted in the introduction, there are many possible challenges that may limit the possibilities for increasing transit competitiveness and may lead to unfavorable choices in transit planning, and in this work, these challenges are investigated further by conducting a case study and using a multiple theory framework.

When investigating the problem of unfavorable choices in transit planning, it is important to first detect what good choices are and how they differ from unfavorable choices that do not contribute to transit competitiveness. This information is accessible within existing knowledge from previous case studies (Skartland, 2021, Forthcoming), theories about transit planning, and best-practice guides. This information makes it possible to evaluate whether unfavorable decisions can be due to lack of knowledge in the planning process and whether the planning documents are providing politicians with a good knowledge base for decisions. Second, it is important to detect whether the planning practitioners working on the case transit projects are aware of “state-of-the-art” transit planning and whether they themselves can point out decisions that deviate from such planning and help detect whether there are other reasons for the unfavorable decisions. To uncover whether unfavorable decisions are case dependent or are due to mechanisms at another and more general level, it is necessary to compare the findings from the two cities. Finally, based on earlier investigations, it is important to uncover what role knowledge, collaboration, and politics have played when suboptimal or unfavorable solutions are implemented.

Based on this, the following research questions are addressed in this paper:

1. When do unfavorable choices in transit planning occur, and how do use of knowledge, collaboration, and political conflicts related to route-change planning projects affect the possibility of increasing public transit competitiveness?
  - a. Is the knowledge used in accordance with what existing theories and case studies recommend?
  - b. What causes unfavorable choices in transit planning according to the planners?
2. What differences and similarities exist between the findings of a and b?
3. How do the findings differ between the two case cities?
4. What role did knowledge, collaboration, and conflicting politics play when suboptimal or unfavorable solutions were chosen?

### 3. Theoretical framework

In this study, the focus is on the circumstances in which unfavorable decisions are made in transit planning. Previous research has identified that unfavorable decisions can be due to lack of knowledge, poor cooperation, or political conflicts (McLeod et al., 2017; Pettersson & Hrelja, 2018; Tennøy et al., 2016; Øksenholt & Tennøy, 2018). Owing to this, the theoretical framework consists of different theories that can explain these three possible reasons for unfavorable choices and how these three reasons are interconnected.

The knowledge used in planning and decision-making will be interpreted with reference to theoretical knowledge about what kind of built environment and urban structure (transit system, land-use structure, and transport system) can increase or decrease transit competitiveness. In addition, theory regarding the kind of knowledge that planners and practitioners should have to enable goal achievement (increase transit competitiveness) will be used, as well as theory on how power and objectives might affect the use of knowledge. The level of collaboration and how it affects decision-making in the transit projects will be interpreted using theory regarding collaboration among stakeholders in transit projects and how level of collaboration might affect goal achievement. To uncover whether unfavorable decisions are made as a result of political conflicts, theory regarding decision-making in

planning and transport projects and how politics, power, and path dependency might affect such decisions will be used to interpret decisions leading to an outcome that can be interpreted as either unfavorable or positive. This interpretation depends on the extent to which the resulting urban structure supports transit competitiveness.

Reflecting my own background as an urban planner and the scope of the journal, the paper focuses on how urban planners use their knowledge on how the physical aspects of urban structure (land use, transport, and route structure design) can affect transit competitiveness. Aspects of transit competitiveness related to socioeconomic factors, culture, pricing, and customers' personal characteristics and preferences are also important, but they will not be discussed in this paper.

#### 3.1. Path dependency

Recognizing path dependency and finding the dominant path in the case cities is relevant to this study because it can provide a possible explanation for why practice and prioritization might deviate from what should be done (according to theory and best practice) to increase transit competitiveness. As stated in the introduction of this paper, “the dominant path” is related to path dependency, which is argued to consist of three elements: (1) the physical (in this case, the urban structure), (2) organizational (in this case, the planners and decision-makers who represent the different organizations and institutions involved in the transit projects), and (3) discursive (in this case, how discourses make themselves known when planners and decision-makers reveal their views through action and statements) (Hrelja et al., 2020).

The term “path dependency” was first used to argue that “self-reinforcing mechanisms exist in the logic of production to ensure that a type of product prevails on the market even though better alternatives exist” (Low & Astle, 2009:48). It has also been used within the field of transportation research, among others, in an “*Institutional Analysis of Urban Passenger Transport in Melbourne, Australia, 1956–2006*” (Low & Astle, 2009). Based on their institutional analysis, Low and Astle (2009) conclude that the continuous support for institutions providing accessibility for the private car since the 1950 s has resulted in a continuous weakening of the actors who work to improve transit: “*The strength of the roads sector in each individual component provides it with solid building blocks and alternative strategies for pursuing its policy agenda. The weaker capacity to successfully overcome obstacles and make the most of opportunities on each parameter presents significant barriers to the public transport institutions. The combined effect of these differing capacities creates institutional path dependence*” (Low & Astle, 2009:57). The authors call for institutional changes to handle this challenge, but such changes have to be substantial.

“Path dependency,” or “the dominant path,” is hard to change. It has been found that implementing measures to drastically enhance sustainable mobility development within a short time frame is difficult in a democratic system. Compromises and politics play a significant role in decision-making and leave little room for sudden and large changes in policy. Studies indicate that the implementation of measures that can lead to more sustainable mobility development is likely to be incremental because of counteractive politics. Owing to this, there will be deviations to a lesser or greater degree from what is required to achieve specific objectives within practice until a new policy and practice are adopted (Fenton, 2016). When investigating the reasons for unfavorable choices in transit planning in this study, it is expected that the dominant path and symptoms of incrementalism might be recognized in the data. Such recognition can help explain why unfavorable choices are made in transit planning and what kind of mechanisms might have led to them.

#### 3.2. A multiple-theory framework

The use of multiple theories in this framework will help us to understand three possible reasons for the unfavorable decisions. The three reasons are lack of knowledge, lack of collaboration, and political

**Table 1**

How multiple theories and existing knowledge can help interpret reasons for unfavorable decisions and help identify whether “the dominant path” in each city region is supportive of transit competitiveness.

<b>A multiple-theory framework</b>			
Parts of “the path” <sup>2</sup>	The physical	The organizational	The discursive
Theories/academic knowledge used to interpret			
Planning practice <sup>3</sup>			
Use of knowledge in land use, transport, and transit planning/planned development <sup>4</sup>			
Planning processes <sup>5</sup>			
Governance and organization <sup>6</sup>			
Collaboration in transit planning <sup>7</sup>			
Power <sup>8</sup>			
Conflicting politics <sup>9</sup>			
Objectives <sup>10</sup>			
Causal relations between urban structure and travel behavior <sup>11</sup>			

<sup>1</sup>(Curtis & Low, 2016; Fenton, 2016; Jespersen, 2000; Low & Astle, 2009)

<sup>2</sup>(Barr, 1972; Forester, 1999; Friedmann, 1998, 2003; Hrelja et al., 2020; Sanyal, 2018; Schön, 1983)

<sup>3</sup>See, for example, (Johansson, Winslott Hiselius, Koglin, & Wretstrand, 2017; Khan, Hrelja, & Pettersson-Löfstedt, 2021; Macmillen & Stead, 2014; Mees, 2000, 2009; Nielsen & Lange, 2008; Næss, 2016; Næss, Andersen, Nicolaisen, & Strand, 2014; Næss, Andersen, Nicolaisen, & Strand, 2015; Næss, Hansson, Richardson, & Tennøy, 2013; Petersen, 2016; Tennøy et al., 2016; Walker, 2008)

<sup>4</sup>See, for example, (Bertolini, 2010; Christensen, 1985; Pløger, 2004)

<sup>5</sup>See, for example, (Hrelja, 2015; Hrelja et al., 2013; Paulsson, Hylander, & Hrelja, 2017; Tennøy & Øksenholt, 2018)

<sup>6</sup>See, for example, (Hrelja, Pettersson, & Westerdahl, 2016; Pettersson & Hrelja, 2018; Walter & Scholz, 2007)

<sup>7</sup>See, for example, (Flyvbjerg, 1996; Mashhadi Moghadam & Rafieian, 2019; Sager & Ravlum, 2005)

<sup>8</sup>See, for example, (Campbell, 1996; Hrelja, 2011)

<sup>9</sup>Overlap with footnote 6, 7, 8 and others

<sup>10</sup>For literature overview see footnotes for Table 3

conflicts, which were chosen because they represent problems and possibilities that previous studies have related to the achievement of the goals of transit projects and plans. The studies are referenced in the footnotes to Tables 1 and 3. This understanding will also contribute to identifying the “dominant path” in the case cities and uncovering whether and where the path takes turns that lead away from the shortest route to goal achievement, which in this case is to increase transit competitiveness versus the competitiveness of the private car. The use and relevance of the multiple theories and how they help identify the “dominant path” and reasons for unfavorable choices are illustrated in Table 1.

In the following section, Table 1 is further explained in order to offer an overview of how multiple theories are applied. The theories used in this work are sorted within the different elements of path dependency: the physical, the organizational, and the discursive. The table should be used to interpret dynamics in practice within the different elements of path dependency rather than understood as different theoretical approaches to path dependence theory.

The physical is also known as “the technical” (Curtis & Low, 2016); as shown in Table 1, I have chosen to connect the physical to the use of theories regarding the causal relations between urban structure and travel behavior and the use of knowledge in land use, transport, and transit planning. Curtis and Low (2016) provides a more in-depth presentation of what Hrelja (2020) describes as the physical, under the term *technical path dependence*:

The physical form of a city can be shaped by the dependence on a particular form of transport...the widespread adoption of the private

vehicle for getting around and servicing the city has made possible the choice of low density residential environments. In turn, these low density environments encourage the building of high quality roads to accommodate private vehicles, thus reconciling low density with reasonable accessibility to services (Curtis & Low, 2016:34)

The reason for connecting physical/technical path dependence to the theories regarding the causal relations between urban structure and travel behavior in Table 1 is that these theories help explain how “the physical” affects transit competitiveness. Theories regarding the use of knowledge in land use, transport, and transit planning are relevant to physical/technical path dependence because planners’ use of knowledge about causal relations in turn contributes to shaping the physical environment and is—or can be—affected by the existing physical environment. For instance, research has shown that building more roads in urban areas leads to an increase in traffic, which then leads to the “need” to expand the road again. Furthermore, “nontraditional changes” in spatial design, such as investing in transport modes and infrastructure other than private cars and roads, might meet resistance due to the physical/technical path dependence. This resistance is then embedded in the urban structure and built environment and thus makes investments in modes other than the private car costly or complex compared to continued reliance on a known transport mode and infrastructure design.

There can also be resistance to making changes in the known ways of doing things within planning practice and the political environment. This resistance can be explained using theories that address the

**Table 2**  
Adapted version of Christensen’s goal/technology table.

Measures Objectives	Known	Unknown
<b>Agree</b>	A: There is an agreement on what objective should be met, and there is known technology that can deliver certain outcomes Objective: Shift toward clean energy production Measure: Produce wind and hydropower energy Premature consensus: Produce wind and hydropower energy while ignoring the existence of fossil energy production Planner role: “Programmer, standardizer, rule-setter, regulator, scheduler, optimizer, analyst, administrator” (Christensen, 1985, p. 69)	B: There is an agreement on what objective should be met, but the technology that can deliver certain outcomes is not known Objective: Inhabit Mars Measure: Innovation/experiments Planner role: “Pragmatist, adjuster, researcher, experimenter, innovator” (Christensen, 1985, p. 69)
<b>Disagree</b>	C: There is a disagreement on objectives, but there are known measures Objective: Shift toward clean energy production Measure 1: Start bargaining process to stop fossil energy production and prioritize wind and water energy Measure 2: Premature consensus: Sectorize energy production and produce wind and hydropower energy while ignoring the existence of fossil energy production: Eliminate conflict and move to box A Planner role: “Advocate, participation promoter, facilitator, mediator, constitution writer, bargainer” (Christensen, 1985, p. 69)	D: There is a disagreement on objectives and unknown measures According to Christensen, this leads to chaos If a problem is identified and a process can be started to find a technology that can solve the problem, the issue is moved to B, where innovation and experiments can happen. If measures are known and there is disagreement on objectives, the issue is moved to C Planner role: “Charismatic leader, problem finder” (Christensen, 1985, p. 69)

dynamics within planning processes, governance, and organizations; level of collaboration in transit planning; power; politics; and objectives. As shown in Table 1, relevant theories and knowledge are used in this work to understand how “the organizational” and “the discursive,” which are aspects of institutional path dependence (Curtis & Low, 2016), can affect transit competitiveness. The organizational refers to an organization’s attributes and abilities: its levels of power, functionality, and stability; its ability to form networks; its ability to affect decision-making; its economic flexibility and strength; and lastly, “the chain of accountability of an organization [that] will affect its capacity to influence policy” (Curtis & Low, 2016:35). The discursive refers to “the interconnectedness of ideas, decision-makers and their mental models of reality: what is ‘important’, what ‘the problem’ is, and how to go about solving it” (Curtis & Low, 2016:36). This work does not feature a deeper dive into path dependency theory, but instead there is a recognition of the potential for unfavorable decisions to be made to avoid disruption to the way of doing things in the way in which they have always been done.

In the following, the theory of planning practice is presented in order to outline what planning practice is regarded to be in this work and how it is conceptually placed in the multiple theory framework, together with the additional multiple theories that are used in this paper.

### 3.3. Theory on planning practice and processes

#### 3.3.1. Planning practice

This section will establish what planning as a practice is considered to be in this work and how such practice is conceptually set in relation to the other theories. The need for a multiple theory framework is, to some

**Table 3**  
Transit service is according to theory responsive to the urban structure.

	Built environment	Transit service responsive to urban structure
<b>Compatible with transit competitiveness</b>	Dense and compact cities <sup>1</sup> Shortcuts and prioritized space for public transport <sup>2</sup> Shortcuts and accessibility measures for pedestrians and cyclists to and from public transport <sup>3</sup> Scarce parking capacity <sup>4</sup> Scarce road capacity <sup>5</sup>	Patronage—economically sustainable market-oriented system is easier to obtain <sup>6</sup> <ul style="list-style-type: none"> <li>• High frequency</li> <li>• Possible with efficient transfer</li> <li>• Pendulum lines and network structure where possible</li> <li>• Connecting work- and visit-intensive areas with high-density areas</li> </ul>
<b>Incompatible with transit competitiveness</b>	Sprawl <sup>12</sup> No shortcuts or prioritized space for public transport <sup>13</sup> No shortcuts and accessibility measures for pedestrians and cyclists to and from public transport <sup>14</sup> Generous parking capacity <sup>15</sup> Generous road capacity <sup>16</sup>	Low level of service, based on equity or coverage policy, or supply oriented subsidized operation, or not operating at all due to market-oriented system <sup>17</sup> <ul style="list-style-type: none"> <li>• Low possibility for high frequency (unless subsidized)</li> <li>• Low possibility for efficient transfer (unless subsidized)</li> <li>• Low possibility for network effect (unless subsidized)</li> <li>• Low coverage/low supply (unless subsidized)</li> </ul>

<sup>1</sup>See for example (Cao, Næss, & Wolday, 2019; Engebretsen, Næss, & Strand, 2018; Næss, Cao, & Strand, 2017; Næss, Strand, Wolday, & Stefansdottir, 2019; Næss, Tønnesen, & Wolday, 2019; Wolday, Næss, & Tønnesen, 2019) and (Ingvardson & Nielsen, 2018; Pund, 2001; Lunke & Engebretsen, 2021; Pont et al., 2020)

<sup>2</sup>See, for example, (Ingvardson & Nielsen, 2018; Mees, 2000, 2009; Nielsen & Lange, 2008; Nielsen, Nelson, & Mulley, 2005; Redman, Friman, Gärling, & Hartig, 2013)

<sup>3</sup>See, for example, (Hillnhütter, 2016; Kager, Bertolini, & Te Brömmelstroet, 2016; Kager & Harms, 2017; Walker, 2012)

<sup>4</sup>See, for example, (Antonson, Hrelja, & Henriksson, 2017; Badland, Garrett, & Schofield, 2010; Christiansen, Engebretsen, Fearnley, & Hanssen, 2017; Christiansen, Fearnley, Hanssen, & Skollerud, 2017; De Gruyter, Truong, & Taylor, 2020; Hanssen & Christiansen, 2013; Marsden, 2006; Weinberger, 2012)

<sup>5</sup>See, for example, (Goodwin, Hass-Klau, & Cairns, 1998; Mogridge, 1997; Tennøy, Tønnesen, & Gundersen, 2019)

<sup>6</sup>See for example (Alves, 2017; Burns, 2005; Devereux, 2005; Howes & Tom 2005; Hrelja et al., 2020; Ingvardson & Nielsen, 2018; Kamruzzaman, Shatu, Hine, & Turrell, 2015; Khan et al., 2021; Mees, 2000, 2009; Nielsen & Lange 2015; Nielsen & Lange, 2008; Nielsen, Lange, As, Mulley, & Nelson, 2006; Nielsen et al., 2005; Redman et al., 2013; Thomas & Bertolini, 2014; Thomas et al. 2018; Walker, 2008, 2012)

extent, rooted in at least two well-known problems in planning theory: (1) that “it is never going to be easy to do theory inside a profession that prides itself on being grounded in practice” (Friedmann, 1998:247) and (2) the contextual differences in planning (Forester, 1999; Friedmann, 1998; Schön, 1983).

In aiming to theorize planning practice, Friedmann defined three types of planning theories: (1) theories in planning, which are about specific areas of planning, transport, land use, regional development, and similar; (2) theories of planning, which are about operating in certain ways and can be used to argue that planning should be done in a certain way; and (3) theories about planning, which are used to interpret planning as it is practiced. Friedmann says that any “critique may come from Marxist, political economy, or sustainability perspectives, among others” (Friedmann, 2003:8) and argues that three themes should be central in planning theory: “the production of the urban habitat; the rise of civil society; and the inevitable question of power” (Friedmann, 1998:250).

According to Friedmann, the urban habitat is where humans work, live, and reproduce, and he defined six socio-spatial processes that

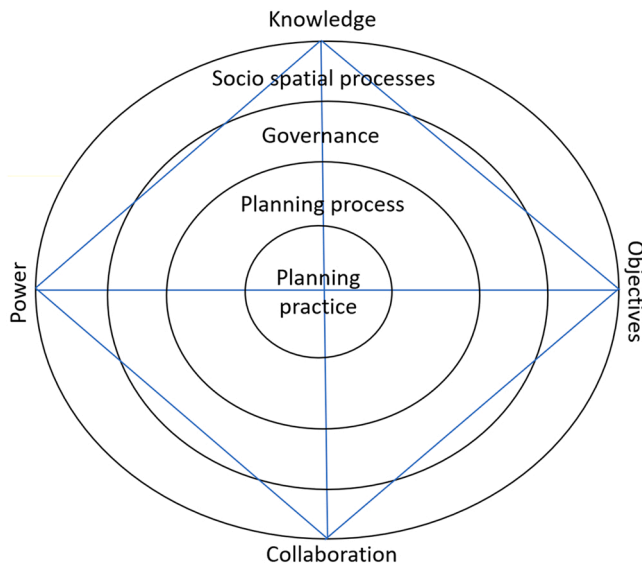


Fig. 1. A conceptual illustration of possible connections and the layering of practices, processes, and components in planning, inspired by the literature referenced in Table 1.

create it: “urbanization, regional economic growth and change, city-building, cultural differentiation and change, the transformation of nature, and urban politics and empowerment” (Friedmann, 1998:251). He also says that professionals with a planning degree—considering planning to be an independent profession—should know how these “socio-spatial processes, ...in interaction with each other, produce the urban habitat” (Friedmann, 1998:251).

In the literature, known theorists address the lack of consensus in planning theory in different ways. In this work, inspired by Friedmann’s ideas, planning practice is defined as the practice of putting knowledge (theory in planning and knowledge about the urban habitat and the socio-spatial processes that create it) into action. The multiple theory

framework consists of theories in planning (urban structure and travel behavior), theories of planning (such as theories on use of knowledge and collaboration), and theories about planning (such as theories on powerplays, decision-making, and sustainability perspectives). In Fig. 1, planning practice is conceptually placed at the center of the multiple theory framework and as the top layer. The figure illustrates possible connections of components, such as power, knowledge, collaboration, and objectives, as well as a possible layering of parallel practices and processes. Layering and connections can be context-dependent, and the framework should, if used for other purposes, be adapted to the main research question and to knowledge gaps.

3.3.2. Collaboration in transit planning

As the possibility of creating a transit system that provides inhabitants with an attractive service is dependent on the existing land use and transport system in a city area, transit service development cannot succeed without good collaboration between different sectors, politicians, planners, and other actors (Hrelja et al., 2013; Hrelja et al., 2020). Hrelja et al. (2016, 2019) have constructed a theoretically based interpretive tool that is specifically for transit planning; it is based on theories from Collaborative Planning and Governance and Business Studies (Pettersson & Hrelja, 2018:2). The inclusion of business studies is explained by institutional changes (more tendering) that have privatized and made market value and competition more important within transit during later years. In Pettersson and Hrelja’s (2018) work, knowledge is recognized as an important resource for achieving “co-action conditions,” which is a “stepwise trust-building and learning process” whereby “independent organizations investigate joint benefits and achieve more than if each had acted independently” (Pettersson & Hrelja, 2018:3). This is found to improve planners’ possibilities of creating good transit systems.

To achieve co-action conditions, stakeholders involved in transit planning have to be able to construct three building blocks (Pettersson & Hrelja, 2018:3). First co-action conditions must be present. When these are present, it is possible to achieve secondary values. Lastly, it is possible to agree upon primary values and achieve co-action, which makes it more likely that the transit project will have a positive outcome. These steps are illustrated in Fig. 2 below, which is adapted and based on

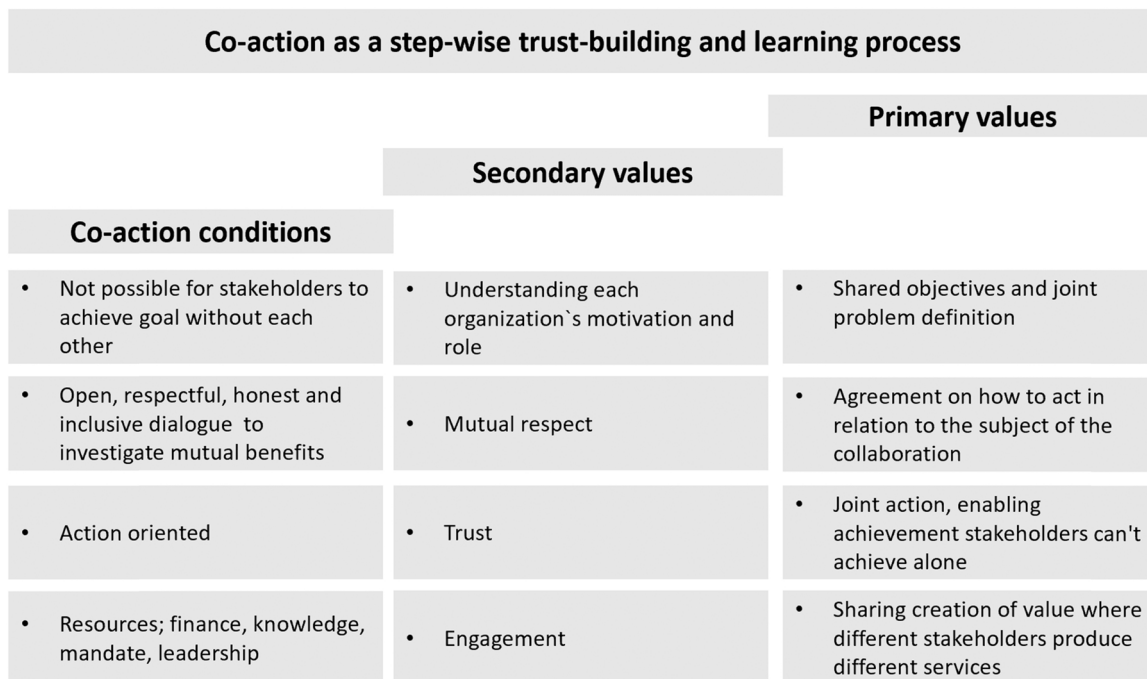


Fig. 2. The figure illustrates the building blocks that are necessary to achieve co-action conditions (adapted from Pettersson & Hrelja, 2018, p.3)

Petterson and Hrelja's interpretive tool.

Knowledge use and the level of collaboration in the transit planning projects that are studied in this paper are likely to be affected by the greater or lesser presence of co-action conditions (which secondary and primary values is dependent on) in the planners' work environment.

### 3.3.3. Use of knowledge and political conflicts

Based on planning and governance theories, (Tennøy et al., 2016) define five different types of knowledge that planners use in practice: [1] process knowledge, which is "about laws, regulations, and procedures of planning and decision-making defined in planning legislation; knowledge about how to carry out planning processes; knowledge about public participation in planning processes..."; [2] knowledge regarding the projects in, and [3] the objectives of, a planning process... [4] knowledge regarding the specific context of the planning and the project" (Tennøy et al., 2016:2,3), such as the spatial environment, political environment, and other plans that might affect the outcome of the project; and [5] expert knowledge, which is defined as "the basis on which planners can approach, understand and deal with the concrete planning problems they face in their practice" (Tennøy et al., 2016:3).

Tennøy (2012) also concludes that knowledge, power, and objectives affect each other. Objectives affect what kind of knowledge is regarded as important when working with a planning project that is meant to achieve a defined objective, and owing to this, power can be found among those who have the most relevant knowledge to achieve the defined objective. According to Tennøy and Øksenholt (2018), "Objectives, knowledge and power affect one another, the planning processes, and hence the plans and developments being the outcome of the processes" (Tennøy & Øksenholt, 2018:96). This is relevant when examining the reasons for the unfavorable decisions that are made in transit planning, because it shows how power can affect what kind of knowledge is used and considered or disregarded. It can also help explain how transit might be less prioritized compared to the private car owing to how power is distributed among actors, even if the objectives push for effort to increase transit competitiveness.

As mentioned in the introduction, the defined objectives that the planners are working toward that are relevant to increasing transit competitiveness are the so-called zero-growth objective and the general objective of ensuring sustainable urban development. The zero-growth objective is that "transport growth in the larger urban areas is to be absorbed by public transport, bicycling and walking" (Tønnesen et al., 2019:35). Urban growth agreements have been initiated in larger cities (among others Trondheim) to enable collaboration between local stakeholders and funding to initiate projects that can help achieve the zero-growth objective. The route structure and Metrobus projects in Trondheim are two intertwined projects initiated in relation to the Urban growth agreement, and they were initiated to help achieve the zero-growth objective. Fifty percent of the funding is covered by the state, which is in line with the urban growth agreement. Hamar has not taken part in any urban growth agreement; still, they have adopted the zero-growth objective and declared a climate crisis. Hamar, together with surrounding municipalities (Mjøsbyen), would like to be part of a city-growth agreement or a similar agreement that can provide funding for local projects and has made an official statement to the Ministry of Transport regarding this matter (Mjøsbyen, 2021). The transit project in Hamar studied in this article is not funded by such an agreement.

### 3.3.4. Political conflicts and decisions

Flyvbjerg (2002) problematizes the relationship between knowledge and power in the paper "Bringing Power to Planning Research." He states that although the common word is that knowledge is power, it can, based on observations of planning processes, be stated that "power defines what gets to count as knowledge" (Flyvbjerg, 2002:361). If scientific research or analysis performed by local planners produces results that are not in line with the local decision-makers' agenda or plan of action for the local development, the decision-makers can use their

power and misinterpret (Næss et al., 2015) or ignore the results, or as Flyvbjerg personally experienced, they can claim that the results are flawed and useless. When power is used to disregard knowledge and the problem is not resolved, this can lead to decisions and measures that deviate from what the knowledge and objectives call for. A possible explanation for decisions that deviate from what knowledge and objectives call for is "the secret transport policy" (Jespersen, 2000). "The secret transport policy" is a term that describes, referring to a Danish context, a situation in which there is an underlying expectation that transport should not in any way hinder activities in society that can contribute to growth and prosperity.

It is not uncalled for to suspect that there is also a secret transport policy in Norway, or at least an operating dominant path with a continuous prioritization of measures that secure growth and good conditions for businesses, such as accessibility for the private car. In fact, the sitting Minister of Transport stated the following in a quite self-contradictory quote regarding the zero-growth objective: "Zero growth is not a goal in itself, but it is important for accessibility in cities and for reducing the negative effects of road transport. Zero growth means good living environments, increased mobility for people living in cities and better conditions for business" (Ministry of Transport, 2020). The quote is self-contradictory because zero growth in the use of the private car is in fact the main goal. It is true that the objective can ensure the positive effects that the minister mentions; however, it is not true that they can be achieved in a sustainable manner without regarding zero growth as a goal in itself. In addition, previous studies of the master plans, transit plans, and strategies in the case cities (Skartland, 2021, Forthcoming) have found that there are conflicting objectives leading to a continuous prioritization of the accessibility of the private car.

Jespersen (in his argumentation about the existence of a secret transport policy) points out that transport, owing to sectorized planning systems, suffers from being separated from important societal structures that are related to individual, societal, and economic interests in the limited resource of mobility: "There are no technical solutions that allow a continuous expansion of mobility. There are limitations to what the ecosystems can endure and how many resources that can be used to sustain the transport sector. There are limits to how much we can allow that traffic disturbs nature and the city environment" (Jespersen, 2000:112). Jespersen (2000) refers to previous studies and suggests an alternative transport policy that can be based upon (1) that it is possible to live without a car, (2) that it is possible to pay to use cars without feeling guilty about it, and (3) there are alternative transport modes, such as high-quality transit and infrastructure for cycling and walking, that make 1 and 2 possible. The zero-growth objective is in accordance with such an alternative policy, but, as stated, there may be reason to suspect that there is a "secret transport policy" in the case cities (and in Norway).

To determine whether power and "the secret transport policy" are affecting whether unfavorable decisions are made in transit planning, it is necessary to recognize whether there is an agreement on objectives to increase transit competitiveness and whether there are measures that are known to do so. Christensen (1985) suggests a typology that can be used to explain the kinds of situations in which uncertainty in planning related to the imbalances and conflicting discourses among planners and decision-makers, as described above, can lead to unfavorable choices. Table 2 (below) illustrates an adapted version of Christensen's table, providing a simple explanation for each of the four defined planning situations: Box A) There is an agreement on objectives, and there are measures (Christensen uses the term "technology") that are known to deliver certain outcomes. According to Christensen, in this situation, planners can easily suggest measures that will lead to goal achievement. Box B) There is agreement on objectives, but the measures are unknown; therefore, an innovation process is needed. According to Christensen, in such situations, planners should recognize the problem of unknown measures and act as innovators or call for expert assistance. Box C) There is disagreement on objectives, and measures are known. According to

### Theoretical framework to recognize events that lead to unfavorable decisions

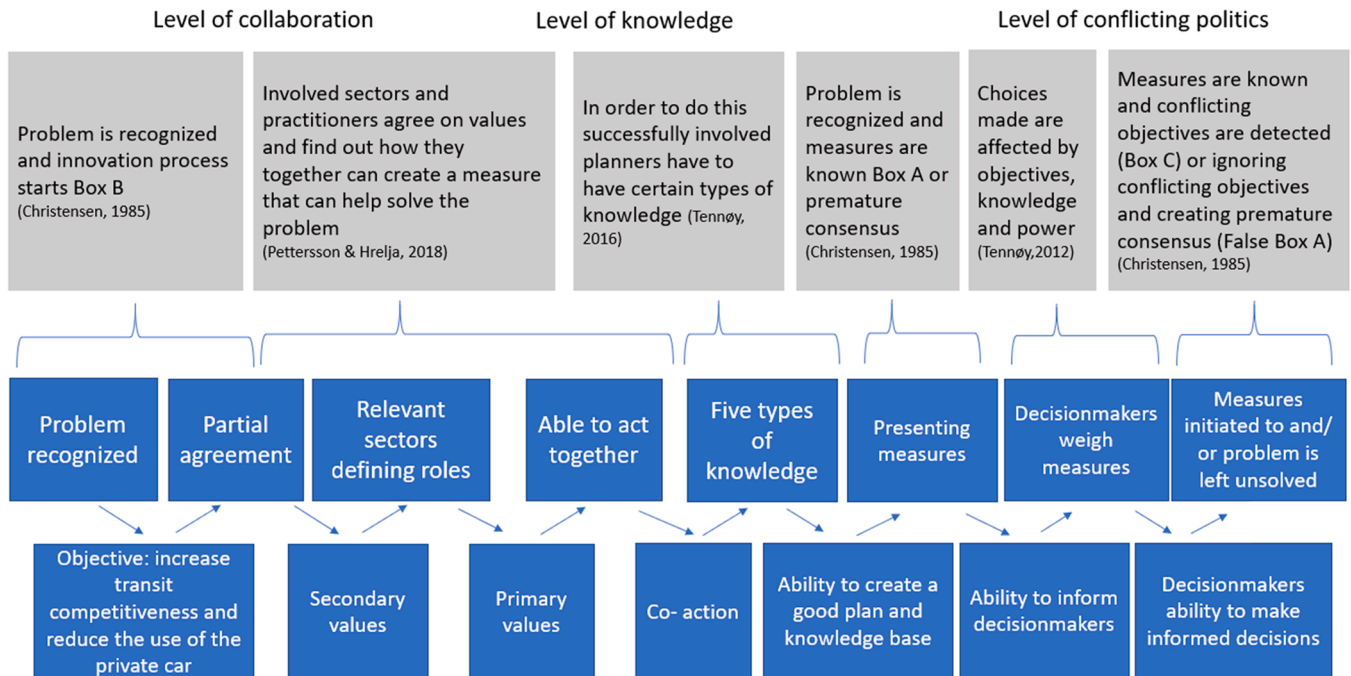


Fig. 3. The figure illustrates how existing theories can help recognize where unfavorable decisions are made in transit planning, and what the dominant path might be in the case cities, by assisting an interpretation of different types of planning situations, level of collaboration, level of knowledge, and level of conflicting politics.

Christensen (1985), in this situation, planners should take the responsibility to point out the uncertainties of conflicting objectives, and they should inform, bargain, advocate, or mediate to reduce these uncertainties. This should not be interpreted as implying that there can only be one objective while other objectives are absent or negligible. Here, the planners' responsibility is not to define what objective is most important; this is a political responsibility. The planners' responsibility is to recognize whether combinations of different objectives and measures can lead to uncertain or contradictory outcomes when implemented. For instance, this entails identifying objectives and measures that conflict with the zero-growth objective and raising awareness regarding the fact that if implemented, these measures can reduce the possibility of achieving the zero-growth objective.

In box C, sectorizing (as problematized by Jespersen, 2000 as well), or the segmentation of specialties, can contribute to ignoring conflicting objectives and enable a premature consensus, which makes the situation falsely qualify as box A. According to Christensen (1985),

*On the goal dimension, the system is prone to premature consensus. That is, the segmented specialization ... skews democratic access and curtails debates between specialties in such a way that each specialty's goal appears acceptable. Instead of being treated as political choices and trade-offs, appropriate to box C, each specialty's goal is cast into box A, and arrives at premature consensus. [Planners should act before premature consensus is a fact;] Since many actual problem conditions are still uncertain, programmed operations often have surprising, unintended, harmful consequences and encounter resistance. The premature programming or premature consensus breaks down. Planners ought to try to widen debate before such failures occur. In terms of the matrix, the planner should focus on boxes B and C. The idea is to recognize uncertainty. (Christensen, 1985:70)*

It is also possible that a disagreement on objectives with measures known (box(C)) can alter to an actual agreement on objectives and measures known (A), based on negotiations, lobbying, debate, or the emergence of alliances. If so, it is not a premature consensus. It will be based

upon an informed conscious agreement or a majority decision after voting on what should be prioritized, which should be the best way to reach a decision in a political climate. In box D, there is disagreement on objectives and unknown measures. Christensen describes this box as chaos, and here, planners should first and foremost detect problems. If a problem is recognized in box D and an objective is decided on through a process of negotiation, debate, or majority vote, the situation can move to box B.

Christensen's interpretation table helps us to interpret the kind of environment in which decisions are being made and the different kinds of behaviors that can be expected of planners in different environments. Different combinations of agreement or disagreement on defined objectives, as well as known or unknown measures, call for different types of action among planners. Christensen herself states that the "matrix matches planning processes to planning problems that are distinguished by different kinds of uncertainty. It is a generic, analytic, and prescriptive device" (Christensen, 1985:69). The interpretation table cannot contribute any answers to what kinds of decisions are more or less correct when aiming to increase transit competitiveness, but it can reveal uncertainties related to objectives and measures. Other theories and previous research (presented in this paper) will help detect what kind of decisions are more or less fruitful with regard to increasing transit competitiveness.

Some would argue that Christensen's interpretation table is simplifying the problems related to uncertainties in planning. It has been argued that the uncertainty in planning is irreducible (Bertolini, 2010) and that this is something that has to be solved, as differences in interests and goals in society are increasing. Considering the term irreducible, it could be argued that the status in planning processes constantly exists in box B, C, or D, wherein uncertainties are present either in relation to measures, objectives, or both. Taking climate change as an example, there are many measures that in theory, we believe will have an effect, but we do not know whether we will be able to put these measures into practice and to what extent they will limit the already-existing mechanisms that are changing our environment. Still, the whole basis of this work and planning as a practice is the notion that we can plan and



implement measures that can solve problems. Even if we are in a state in which uncertainties are irreducible, we are still forced to act on the basis of believing that the changes we implement as planners will contribute to solving problems, at least to the extent possible in a given situation or context.

Based on what we know about “the secret transport policy” (Jespersen, 2000), the use of power in planning (Flyvbjerg, 2002), dominant paths (Fenton, 2016; Low & Astle, 2009), and problems in transit planning projects (Hrelja et al., 2020), there is reason to believe that box C is a dominant situation when it comes to transit planning and that premature consensus is at times the result of sectorization and the difficulties related to organization and collaboration (Hrelja, 2015; Hrelja et al., 2020; Pettersson & Hrelja, 2018). There is a clear conflict between the objectives to strengthen conditions for transit and the objectives that decision-makers believe require a continuous accessibility for the private car. According to Christensen (1985), planners have a responsibility to inform decision-makers when measures deviate from the actions that objectives call for. In this work, the interpretation table will help us interpret the extent to which planners (as producers of knowledge and measures) and politics (politicians and other decision-makers) agree on the objectives and measures that should be used to increase transit competitiveness. The results and the adaptability of Christensen’s interpretation table will be addressed in the discussion section.

It will be a part of this work to investigate whether there are causal relationships between knowledge use, the extent of co-action conditions, and the political conflicts affecting the transit planning projects in Trondheim and Hamar. This investigation will thus contribute to knowledge regarding when and why unfavorable decisions are made in transit planning and why, in spite of many best-practice guides and large investments, variable outcomes of transit projects are found in the literature.

Christensen’s table will be used as a tool for answering research question four to uncover what role knowledge and competing objectives have played when unfavorable solutions are chosen in the transit projects studied in this work. Is there, for instance, an agreement that reducing the use of the private car and increasing transit competitiveness is important, and are there measures that can bring about such changes? Are there other objectives, such as economic growth in society (as previously mentioned in relation to “the secret transport policy”; cf. Jespersen, 2000) that conflict with the objectives of reducing the use of the private car and increasing transit competitiveness?

### 3.3.5. A multiple-theory theoretical framework to recognize where unfavorable decisions are made

As explained in the introduction of the theory section and as shown in Table 1, multiple theories and previous research are used to determine what lies behind unfavorable decisions in transit planning. According to previous research and literature reviews, decisions counteracting the goals of increased transit competitiveness can be due to lack of knowledge, poor collaboration, or political conflicts. As described in this section, these three components have been interpreted and explained using theories in planning, of planning, and about planning. The three components also correspond to the three facets that make up the dominant path: the physical (knowledge and theories in planning), the organizational (collaboration and theories of planning), and the discursive (politics and theories about planning).

In an attempt to illustrate where the different theories help us interpret the data from interviews and the document study, Fig. 3 shows a planning process (according to theories used in this work) from recognizing a problem to deciding what kind of measure should be implemented to solve it.

## 3.4. Auxiliary theories

### 3.4.1. Land use and route structure design

The built environment affects the degree to which transit can

compete with the private car. The locations of residential areas and the locations of work and visit-intensive functions are crucial within transit planning because these areas hold large groups of potential transit passengers (Skartland, 2021). Based on the findings of previous studies on the causal relationship between land use, transport, and transit, it is very clear that the level of transit service possible in an area is dependent on the existing land use structure and transport system (Skartland, 2021, Forthcoming). This insight can contribute to an explanation of why there are various outcomes of transit projects; one strategy and design cannot fit every city, as the urban structures in cities are unique. Still, existing knowledge from previous case studies and theory does provide some rules of thumb that can explain how land use, transport measures, and level of transit service affect each other. This is illustrated in Table 3.

When planners aim to find the best locations and network designs, they need to gather or produce knowledge that enables them to create transit systems that connect important work and visit-intensive areas and residential areas (Skartland, Forthcoming). Where routes are located and what kind of service is provided in different areas are dependent on whether the goal is to increase coverage (several routes and lines and no/little transfer), equity (equal distribution of service regardless of population density), or patronage (service is responsive to population density, and areas with high population densities are prioritized) (Walker, 2008).

From the information provided above, it is clear that integrated transport and land-use development is crucial to improve transit competitiveness. Many studies state that the difficulties related to enabling an integrated land-use and transport development (and transit-oriented development) have to do with a sectorized planning system (Hrelja et al., 2013; Hrelja et al., 2020). However, it has also been found that the integration of land use and transport sectors does not necessarily lead to integrated land use and transport planning in practice (Legacy, Curtis, & Sturup, 2012). Although this is relevant and will be discussed later, the focus of the present section of the paper is on causal relations between the urban structure (land use and transport) and transit competitiveness.

### 3.4.2. Best practice in transit planning

In this work, the term best practice refers to recommended strategies, measures, and planning practice for transit planning that are knowledge (scientific and practical) based. Best-practice recommendations can be designed locally to contribute to a desired development and are not always a direct reflection of what purely scientific approaches would recommend. Owing to this, best-practice recommendations (guiding documents) and scientifically based theory (peer reviewed) regarding transit planning are analytically separated in this study, although both can explain and recommend a certain practice within transit planning. To determine what good decisions are and how they would differ from unfavorable ones, it is important to illuminate what state-of-the-art transit planning is according to theory and best-practice guides. Still, it is clear from previous studies on the route structures in the case cities that even if routes are designed according to best practices and theory, there are limits to what can be achieved through route structure planning (Skartland, 2021, Forthcoming). If the existing urban structure is not transit oriented but is instead more supportive of the use of the private car, a high-frequency transit service that can provide something close to “a network effect” becomes almost impossible unless authorities are willing to significantly subsidize transit (Skartland, Forthcoming).

As stated above, the level of transit service possible in an area depends on the urban structure. Previous studies of the two case cities have found that the existing urban structure (city structure and city size) in these cities can both limit and enhance transit competitiveness (Skartland, 2021, Forthcoming). The existing urban structure is car-friendly especially in Hamar, but is less so in Trondheim, which has had transit-oriented land-use development for several years. Owing to the built environment and current use of the private car locally, transit in Hamar can hardly compete successfully with the private car in this city,

**Table 4**

Case city attributes.

Case city regions	Formalities	Existing urban structure and travel behavior characteristics	Network changes and aims
<b>Trondheim</b>	<b>Inhabitants* *:</b> 189,271 <b>County:</b> Trøndelag <b>City region municipalities:</b> Trondheim <b>Bus company:</b> AtB (AtB plans the transit in Trøndelag; 100% of AtB is owned by the county)	Monocentric Mainly densified city center, some residential areas, and workplaces in suburban areas Main transport mode shares (National Travel Survey 2018; (Norwegian Road Administration, 2019): Private car driver/passenger: 46% / 10% Transit: 11% Cycling: 8% Walking: 24%	<b>Project name:</b> Metrobus <b>Project purpose:</b> New and more efficient route structure due to lack of capacity in existing route structure, increase transit competitiveness <b>Type of change:</b> Route, frequency, and infrastructure, aiming for network effect <b>Practitioners involved:</b> Land use planners, network planners, consultants, etc
<b>Hamar</b>	<b>Inhabitants* *:</b> 28,434 <b>County:</b> Hedmark <b>City region municipalities:</b> Hamar <b>Bus company:</b> Hedmark Trafikk (Transit planning is administrated by the county, Hedmark Trafikk administrate and operates the transit service)	Monocentric Small, densified city center; some residential areas and workplaces in suburban areas; and dense small cities and villages within commuting distance Main transport mode shares, based on the National Travel Survey 2014 (Urbanet Analyse, 2018): Private car driver/passenger: 66% / 9% Transit: 4% Cycling: 5% Walking: 15%	<b>Project name:</b> Change in route structure <b>Project purpose:</b> New and more efficient network structure, increase transit competitiveness <b>Type of change:</b> Simplification and lengthening, increasing frequency <b>Practitioners involved:</b> Local planners and consultants, etc

\* \*The number of inhabitants (morphological city) in each region (SSB, 2020)

even though planners have designed the local transit route structure according to best-practice recommendations (Skartland, Forthcoming). Considering this, it could be that a goal for transit to compete with the private car in Hamar is too ambitious, while increasing transit competitiveness in general is not. Transit competes to a greater extent with the private car in Trondheim, where the existing urban structure is more supportive of transit competitiveness, at least for commuting trips to its central areas (Skartland, 2021, Forthcoming).

There are many best-practice guides that transit planners in this case study have referred to in their planning documents and in their interviews, some of which are based on international case study research (Burns, 2005; Devereux, 2005; Howes & Tom 2005; Nielsen et al., 2005). Others are official guides from the Norwegian Road Administration (NRA) and strategies and guides from the counties and official bus companies. There are several recommendations for what kinds of knowledge should be used within transit planning in the best-practice guides to which Norwegian planners have access. These recommendations focus primarily on data quality, how different types of tools and analyses might affect the outcome of such analyses, and what kinds of tools and analysis should be used for different purposes. Nielsen et al. (2005) present general recommendations but also point out that the kind of knowledge that can be used is also dependent on what kind of knowledge the planners have access to. Additionally, even though some

cities might suffer from a lack of data material, considerations among planners based on local knowledge, experience, and theoretical principles can lead to the design of good transit systems (Nielsen et al., 2005).

In this study, it is crucial to investigate best-practice guides and recommendations regarding transit planning to enable the detection of unfavorable decisions. However, it is also important to mention that previous findings give reason to tread carefully when looking at best-practice guides and recommendations. The paper "Urban Public Transport: Planning Principles and Emerging Practice" states that "despite the promise of network systems, reform programs do not follow a universal trajectory and have highly variable outcomes...Curiously, there are innumerable cases of transportation project failures in the literature" (McLeod et al., 2017:232). The paper refers to a study on the functions of best practice in sustainable mobility, which recommends "caution and circumspection when dealing with best practices in transport policy-making. Behind the seemingly objective and benign nature of best practice lie some very subjective and political choices" (Macmillen & Stead, 2014:85).

It has also been found that "the poorest outcomes in transport planning decision-making tend to, at least in part, occur when rational decision-making, stakeholder analysis, and technical analysis are not balanced or well integrated" (McLeod et al., 2017:232). This case study can provide an explanation of whether and how such imbalances contribute to unfavorable choices in transit planning.

#### 4. Methods

The purpose of this work is to investigate when unfavorable choices are made in transit planning and how such decisions might be connected to collaboration, political conflict, and the use of knowledge. As it is a goal of this study to reveal causal mechanisms within three different areas of planning, a qualitative case study of two cities is considered a suitable approach (Flyvbjerg, 2006). One small and one medium-sized city have been chosen for this project because there is little research on the applicability of best practice in transit planning in different contextual environments (Nielsen & Lange, 2008). In general, there has been little research on when unfavorable choices are made in transit planning and how the use of knowledge, collaboration, and political conflict might affect transit competitiveness. As it is a goal to increase transit competitiveness and reduce the use of the private car in many cities, a case study should be conducted to reveal what kind of challenges planners face when making changes to transit systems.

##### 4.1. Presenting the case cities

The following map (Fig. 3) illustrates the locations of the case cities. Information regarding city size, city structure, and other important attributes relevant to understanding the contextual environment of the topics discussed in this paper is provided in Table 4.(Fig. 4).

##### 4.2. Interviews and document studies

This work is based on interviews with planners (Table 5) and document studies (Appendix A). Planners and practitioners from various stakeholders have been interviewed for this work because transit planning in Norway involves the county, transit companies, the municipality, and hired consultants. The Chief of Transport represents a political role and contributed with an overview of the political context in the interviews. The planners answered questions regarding the objectives of the local land-use and transport plans and how they could affect the transit competitiveness. They also answered questions regarding planning practice and the use of knowledge. The list of questions is provided in Appendix B. The planning documents were interpreted to uncover conflicting objectives and use of knowledge. Moreover, official meeting protocols and the like contributed to the interpretation of both planning practice and decision-making.

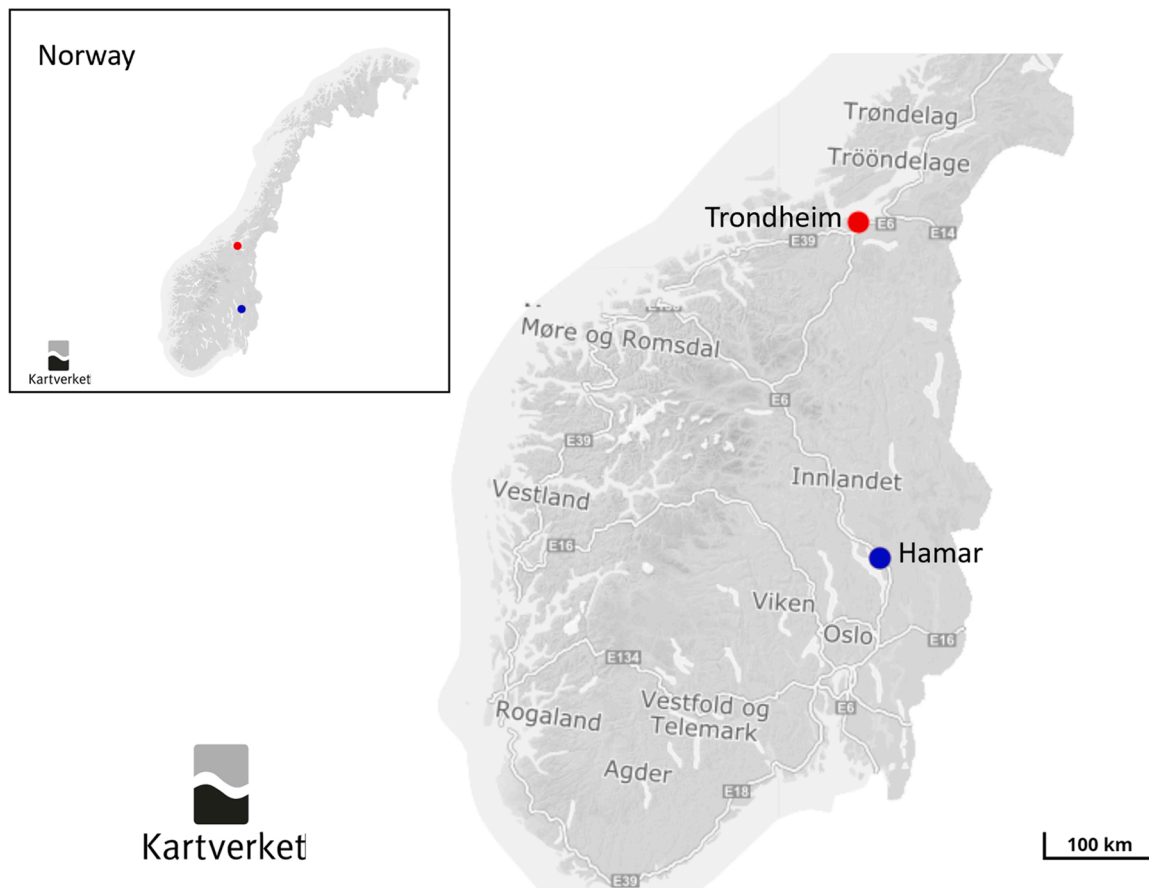


Fig. 4. The location of Trondheim and Hamar. Map elaboration by the author. Map retrieved from (norgeskart.no) ©Kartverket.

Table 5  
Interviewee overview.

Interviewees' formal affiliations and relevance to the case projects (*two interviews)				
Chief of Transport	Municipal planner	Bus company representative	Project leader	Route/network planner or consultant
Trøndelag County	Trondheim*	AtB	Metrobus	Represented in the other interviews
Hedmark County	Hamar	Hedmark Trafikk	Planner Hedmark	Consultant

4.2.1. Limitations

In this work, there was a focus on selecting informants that have been directly involved in the transit planning projects in Trondheim and Hamar. The reason being a focus on planning practice in this study. Therefore, the informants mainly represent planning practitioners, while inhabitants, community representatives, and politicians were not interviewed for this work. An interesting topic for further research would be the perspectives of community representatives and politicians, as this would enable an analysis of how the power dynamics and strategies both “from below” and “from above” affect planners’ practice in working to strengthen the ability of the plans to achieve their goals.

4.3. Presenting the route structure changes

It has been difficult to retrieve identically designed maps (colors, layers, legend, and scale) and spatial data that would make it possible to create such maps for the purpose of this paper. The planners involved in

this project have provided the following maps (Fig. 5, Fig. 6) to illustrate a before and after situation of the route structure changes.

5. Findings

5.1. When do unfavorable choices in transit planning occur, and how do use of knowledge, collaboration, and political conflicts related to route-change planning projects affect the possibility of increasing public transit competitiveness?

The findings described in the following were found through a qualitative and theoretically based analysis of interview material and documents. Information from the data was selected on the basis of what previous case studies presents as “state of the art” transit planning, and what theory regarding the goal achievement potential of planning projects and decision making points out as important causal mechanisms that can explain the outcomes of such projects.

a) Is the knowledge used in accordance with what existing theories and case studies recommend?

Based on the findings from interviews and document studies, it is very clear that the planners working within the transit projects were (and are) very competent, and in areas where they lacked competence, they hired competent consultants. A part of this work is to detect whether a lack of knowledge leads to unfavorable decisions in transit planning. The investigated material indicates that this is not the case in these transit planning projects. Both the planners themselves and the planning documents were very up to date on best-practice (i.e., recommended strategies, measures, and planning practice for transit planning)

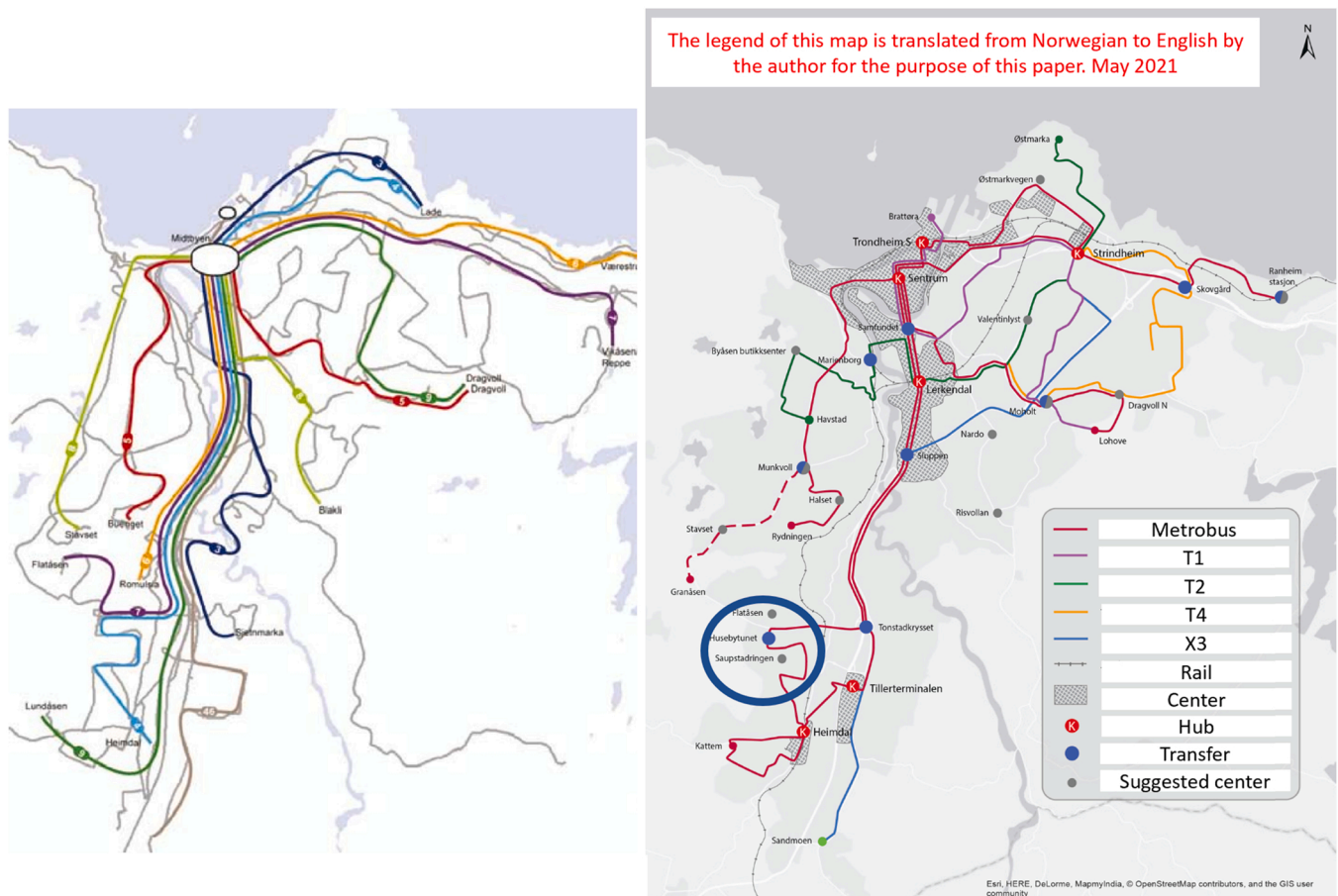


Fig. 5. Maps of previous and proposed new transit networks in Trondheim. The map to the left shows the previous network structure (Trondheim Municipality, 2013), and the map to the right (AtB, 2016) shows the suggested new network structure. Saupstadringen is marked with a blue circle as the area is addressed in the text. Map elaboration by the author.

recommendations and scientifically based knowledge. It can thus be argued that the planners had *expert knowledge* (Tennøy et al., 2016) themselves or at least recognized the need for additional help from experts. In the following section, an overview of their knowledge base is presented.

### 5.1.1. Trondheim

In Trondheim, the “New Route Structure in the Trondheim City Region” project was initiated because the existing system’s capacity was exceeded. Buses were creating bus congestion in city center streets, and it was regarded as impossible for the existing transit system to be able to handle the expected growth in demand for transit. Owing to this, several official organizations—the county, the municipality, the local road administration, and the bus company AtB—worked collaboratively on a large project to produce the necessary knowledge base and plan a new route structure. This work resulted in the official document “*Future Route Structure with Superbus in Greater Trondheim 2019–2029: Summary Report with Recommendations*” (AtB, 2016).

In the case of the Trondheim city region, local planners from official organizations and some hired consultants were divided into five groups to produce the knowledge base and contribute to the planning of the new route structure. The groups included a “land use and route structure group,” a “customer, communication and information group,” an “information technology and system group,” a “material, environment, fuel, and facilities group,” and an “economy, quality, and contract group.” In this article, the focus will be on the work done by the “land use and route structure group,” as the focus here is on urban structure. The ambitious main problem that the planners aimed to solve in their

work is defined in the summary report as follows:

“How does the physical route structure, including the superbus [now Metrobus] and corresponding routes and related infrastructure in Trondheim, Klæbu, Melhus and Malvik, have to be from august 2019 to august 2029 in order to ensure a cost-efficient, customized to needs, attractive, future-oriented and environmentally friendly transit service that contributes to reaching the zero-growth objective counting from year 2015 until 2050?” (AtB, 2016:2)

A presentation of how the new transit system could play a role in helping achieve the zero-growth objective was presented early in the document. This was presented along with planning principles and other possible measures to increase the use of transit locally. The document explains the planning principles and gives the reader an idea of the theoretical base for the planning principles that are chosen in order to increase the use of transit and decrease the use of the private car. The planning principles refer to the Hi Trans best-practice guides (Nielsen et al., 2005), the NRA principles for route structure planning, and “*other administrative companies’ work on developing transit route structure in larger cities*” (AtB, 2016:13). The planning principles push towards main transit routes with high-frequency pendulum lines through the city center and aim to create a network effect by providing transverse lines in suburban areas to avoid further congestion in central areas.

According to the documents, the collaboration and the project resulted in the following knowledge base:

- Evaluation of the existing transit service
- Urban, residential and business development

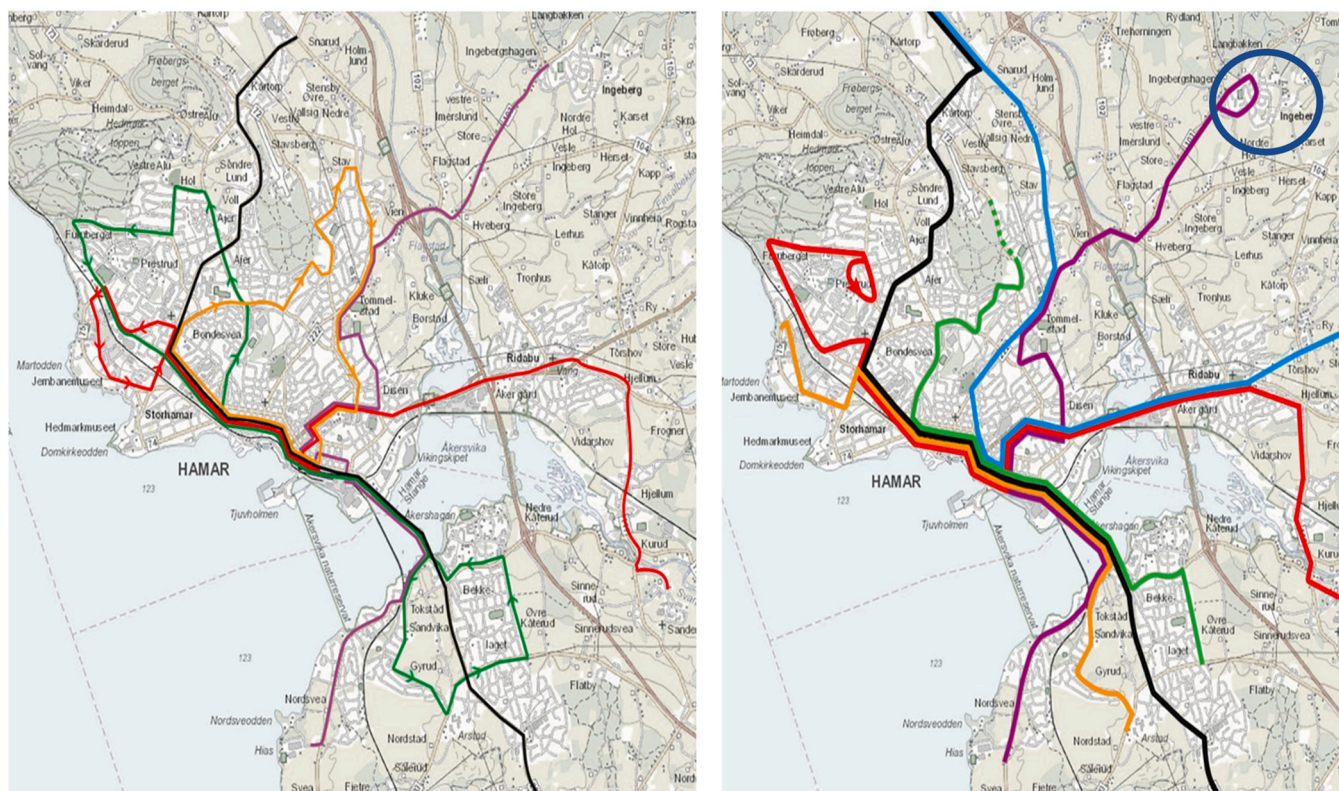


Fig. 6. Maps of previous and proposed new transit networks in Hamar. Map elaboration by the author. Previous route structure to the left and new suggested structure to the right (Map retrieved from Hedmark Trafikk, Power-Point Presentation 16.05.2018) Ingeberg is marked with a blue circle as the area is addressed in this work.

1. Population
  2. Land use development and need for land in a 2050 perspective
  3. New residential areas and their location
  4. Residential and business development strategy
  5. Central area development
  6. Location criteria for business and industry development
  7. Location of new workplace and industrial areas
- Analysis on travel flows and accessibility
    1. Atp-model (GIS) analysis (accessibility)
    2. Regional transport model (travel flows)
    3. Walking distances (accessibility)

- Capacity and cost estimations

In Trondheim, the regional transport model was used to detect the largest travel streams. It was also meant to help illustrate where people drive their cars and to change the public transport route structure accordingly, hoping that it would help increase the use of public transport and decrease the use of the private car.

Land use development areas was mentioned as a challenge in the documents. Due to large land use development areas in the land use plan, it was difficult to calculate where future growth and demand for transit would occur. Due to this, planners could only depend on plans that were adopted or projects that was already initiated. It is stated in the document that this was a weakness that led to challenges for the planners that was responsible to find the best location for the new transit routes.

### 5.1.2. Hamar

In the case of the Hamar city region, consultants were hired to help

design a more efficient and competitive transit system. The consultant firm made a deliverance consisting of the following:

- A market analysis
  1. population densities
  2. workplace densities
  3. population growth until 2040 in Hamar, Løten, Stange and Ringsaker
  4. planned land use development and recommendation of transit-oriented planning
  5. walking distances to and from stops along suggested routes, 3–400 m distance is used, but it is stated that some might accept to walk longer if the frequency is higher than before
- The improvement potential for the existing transit system
  1. boarding per stop
  2. strengths and weaknesses in the existing transit system
- Some principles for the further development of the transit system
  1. With reference to *Public Transport – Planning the Networks* (Nielsen et al., 2005), *Network Principles* (Ruter, 2011), *79 Advices for Development of Transit in Less Central Areas* (Nielsen & Lange, 2015)
  2. Simple network structure where lines meet and create a higher frequency
  3. Straight lined routes
  4. Avoid inefficient routes (many turns, ring-shaped, etc.)
  5. Stiff timetables with a focus on adapting the service to “quiet hours”
  6. Timed transfer
  7. Optimal frequency

8. Optimal distribution of city bus lines and regional lines
    - A recommendation for a new route structure and network with assessment criteria and overview of consequences for market and economy
  1. Remove all ring routes and replace them with pendulum routes with a high frequency
  2. reduce coverage while increasing frequency where the potential for customers are bigger
  3. Timed coordination of lines that share routes
  4. Route structure that prioritizes realistic efficiency and efficient use of buses
- Overview of the needed kind of infrastructure.
1. True time system
  2. New end stops
  3. Adapt former ring routes to two bus routes
  4. Improve infrastructure to ensure efficiency
  5. New stops

The consequences of the proposed changes were described in the document. It was stated that although the coverage is reduced, the distribution of the new routes is adapted to where the customer demand is larger. Owing to this, some inhabitants will have to walk longer to take the bus with the new transit service. It is warned that these inhabitants might object to the changes, while other inhabitants with an improved service will “stay quiet.” The new route structure is promised to deliver a higher frequency than before, better route production and good use of fleets, positive environmental consequences (electrification possible and probably less idling due to bus facility location), and a simpler system for passengers. It is added that land-use development is used actively in the route structure and network design; it is argued that this delivers transit service to newly developed areas early.

#### a) What causes unfavorable choices in transit planning according to the planners?

The findings from the interviews are presented under the subsections “knowledge,” “political conflict,” “and lack of collaboration” to give a clear presentation of how the findings are related to the topic of this paper. That said, it became very clear in the interviews that separating use of knowledge, production of knowledge, collaboration, and political conflicts is impossible. As [Tennøy \(2012\)](#) states, it is clear that knowledge, objectives, and power affect each other. Owing to this, the subsections do not and cannot separately discuss either knowledge, political conflicts, or lack of collaboration. Instead, effort is made to let the reader shift focus from one aspect to another while reading about the findings from the interviews. To make efforts to clearly separate the three factors in the text would give the false impression that they do not affect each other.

#### 5.1.3. Trondheim

In Trondheim, there was a goal to design and implement a new route structure within a timeframe of around three years (2016–2019). All the interviewed planners stated that this was a challenge. The planners had to produce a knowledge base for a total change; the route structure had to go from a radial network to a network with high frequency and high-quality service in the main axes through the densest areas of the city. The planners also aimed to create the possibility for passengers to travel by transversal routes that connected suburban areas and enabled passengers to travel without having to go through the city center. This was done to create a network effect and avoid congestion in the city center. This conceptual change has been described as “revolutionary” in the interviews and planning documents.

#### 5.1.4. Knowledge

The “New Route Structure in the Trondheim City Region” project (the route structure knowledge base and recommendations) and Metrobus project (infrastructure and conceptual development) in Trondheim are closely connected. The two projects have involved many different local planners and organizations, as problems related to spatial planning, future city development, economy, customer demand, infrastructure, and technology and material issues had to be detected and solved to initiate the desired “revolutionary changes” in the transit system.

As previously described, the route structure project was divided into five groups that focused on different topics. The planners interviewed for the purpose of this work were involved in the work related to land-use planning and the locations of the routes. One of the planners stated that the route structure project and its concluding recommendations were based upon a large body of knowledge. At the same time, the planner pointed out that the concluding report, which summarized the knowledge base for the project, was difficult to read owing to its complexity and detailed information. The planner was responsible for writing the case descriptions for the politicians who had to choose between different route structure alternatives, and she decided to deliberately write a case description that would be understood by the politicians. The aim was to make them understand the possible consequences of their choices, as well as the knowledge base underpinning the planners’ recommendations.

I actually started the case by writing a few things about what the planners had in mind for the project and different ways of thinking about route structure planning and, in a way, how it has historically developed...so, sort of presenting the facts first. And then I did something completely different because I thought the route structure report had such poor readability. So, I described district by district and made the consequences clear: Alternative 1 gives the following consequences, alternative 2 gives...and then I summed up with a section that described the advantages and disadvantages of the different alternatives. I did this for each district... I finally explained [as an input included] in the municipal director’s elucidation that is where we, in a way, try to influence the politicians in a professionally based direction and that is where, in a way, the assessment lies. So, everything before that is really facts... I believe this is where we need to be: arguing for the subject, while above it should just be facts so that they are free to understand what this is about, and then they can understand why we have thought the way we have in the last part.

#### 1. Route structure planner

The planner pointed out that although the knowledge base was large in the end, and efforts were made to influence politicians, some changes occurred after the route structure planning project was adopted. In the “New Route Structure in the Trondheim City Region” project, the planners found that owing to heavy travel flows, it was necessary to create a second Metrobus route from the southern parts of Trondheim toward the city center. The final location of the second route ended up being affected by some political play.

We didn’t think that the Metrobus would go via Saupstad. But then there was a development project at Saupstad, and it became an issue that this area should be serviced by the Metrobus. So, it was probably more of a political choice because in terms of Metrobus, the service of Saupstad is not entirely optimal. It is a small local road, Saupstadringen. And now the Metrobus takes much more time than planned; the principle for Metrobus is that it should be efficient. So, in that case, we didn’t stick with the Metrobus concept. But it was a political choice.

## 2. Route structure planner

Further, the planner pointed out that after creating a knowledge base, it should be noted that although the facts are out there, it is the main planning principles that are the result of the analysis. The main planning principles should provide some room to adapt the final route structure to other considerations that also have to be taken into account. Such considerations can occur if the bus company later finds economic or practical reasons for doing so. For instance, the planner stated that during the initial planning phase, the planners found that the transfer from suburban feeding routes to frequent Metrobus routes should not happen too close to the city center. They found it unattractive for passengers to take the bus and wait to transfer at a transfer node close to the city center. Some of the changes made by the bus company after the route structure project was completed were to place some transfer nodes closer to the city center than initially planned. The planner summed it up with the following statement:

The fact of the matter is that we can plan and lay down as many guidelines as we want, but in the end, it is the negotiations related to tendering that will... It is AtB [the bus company] who decides in the end what they, among different considerations, choose to prioritize.

## 3. Route structure planner

### 5.1.5. Collaboration

Another planner, who was mostly involved in the part of the Metrobus project wherein the conceptual framework and physical outcome of the project were to be realized, pointed out challenges related to knowledge, political conflicts, and collaboration. In the interview, it was revealed that the first year of planning consisted of several internal challenges in the multi-organizational planning of the Metrobus. The first group of planners was replaced with a new group of planners after a year because of conflicts and difficulties arising in relation to creating a concept that was in line with the budget. The planner explained in the interview that when the new planning group was in place, they found a need to do some additional analysis. Although the route structure project had done a lot to find good locations for the routes, the planners involved in the Metrobus project revealed that there were numerous challenges related to the conceptual development of the Metrobus; streets and stops had to be adapted to the new service. Owing to this, the planners initiated additional analyses of the route structure report. Consultants were hired to conduct an accessibility analysis and a demographic analysis in different areas. The planner argued in the interview that a more detail-oriented analysis should have been done earlier in the process to defend the placement of lines and stops.

We thought it was a weakness to move on without testing the waters, because what we could end up with was making stops that might have to be moved later because they turned out to be useless in relation to the user groups. So, we did a little quality assessment, you can say, on the proposed structure...demographic and spatial analysis on how many people are over 60 years old...how far are they from the stations? Where is the nearest service institution, such as nursing homes or old people's homes, to the stations? How much of the city's population reach our stations now within a ten-minute walk? We have made such calculations in hindsight to actually reinforce what was done in the summer of 2016 [the New Route Structure in the Trondheim City Region project], when they calculated where the lines should go.

## 1. Metrobus planner

The additional analysis did make a difference, and some stops were relocated. The planners also used additional analysis and

knowledge to communicate to politicians that to make a better transit service, they needed to implement some changes.

We presented some cases to the politicians about where we had to move some stations, based on what we are talking about now... So, we did some optimizations... we almost snuck them in. But it shows that it pays to do such things in advance because then it is easier to make changes later.

## 2. Metrobus planner

When it comes to other factors affecting decision-making, some information related to communication between different stakeholders involved in the project was mentioned. The first issue was related to the communication with the municipality. The Metrobus planner problematized that due to the fact that the land use plan was not updated in areas that some of the Metrobus routes were planned to service, the municipality was unable to provide information that could help the planners in the Metrobus project. The planner stated in the interview that the impression of the situation was that the Metrobus project had to take lead and make decisions where the municipality was not able to provide necessary information on further development. This issue has been mentioned both in the interviews with municipal planners, and it is also mentioned in the Route structure project report that due to a large capacity of areas available for future development, the municipality did not know when and how the future development in some areas would turn out. The Metrobus planner stated that especially in areas where there were strong industrial and market interests, the municipality left decisions to the metrobus planners. This particular issue was not mentioned by the municipality or in the planning documents.

Another issue raised by the Metrobus planner was that different cultures among the involved organizations affected not only how different problems were perceived but also what was considered to be true and important. The interdisciplinary collaboration worked well within the project group, and the planners pointed out in the interviews that this was a crucial success factor. Still, it was also mentioned that there was a difficult side to this, as the planners in the project group faced criticism when communicating with their employers about the aims of the Metrobus project and what it was doing.

So, the issues we encountered were that we in the project became very close together, so the individuals who worked with us and came back to the Norwegian Roads Administration, for example, were almost torn to shreds, to put it nicely. They were met with great opposition in their organization because they did not agree with what the Norwegian Road Administration thought or what the county thought... This is perhaps the most important part of the system—that you do not gather the sector planners in the decision core that is the project—because then they never agree... To establish a core group that understands the implementation and goals of the project that benefit from their knowledge from their organizations, I think it was very important to actually get this project done in a short time.

## 3. Metrobus planner

The planners in the Metrobus project who took over from the first project group had to deal with a blown budget. The planned development that the first project group designed had a cost of 1,2 billion Norwegian kroner. The budget was 420 million kroner. Due to this problem, the planners who took over had to figure out how to redesign the Metrobus project so that it would be according to budget. In the interview, the planner could inform us that the project group decided to make four alternative quality-based options of the Metrobus and present these alternatives to the politicians. The aim was again to communicate the relation between the politicians' choices and what the consequences would be.

So, we tried to tell them, what do we get for 420 million? But then we presented an alternative for 550 million, one at 660 million, and one at 750 million. So, we put in a lot of work—as much as we could—because it was important to put in place a framework for finances and quality. So, we tried to tell them, what do you get for 550 million and for 620 million? And what will this cost to operate in the future? So, we tried to tell them that the more you build, the more quality you get. But you also reach a limit where it is less about durability... it is more about the finish and what is nice. So, when we presented that case in April 2017 with four alternatives, we believed in 420 million and that the politicians would go there... but we hoped for 550 million because it would be a significant improvement from 420 million. But we did not expect to get 750 million... It was tactically a clever way, I would say, because we let the politicians get the choice and see the consequences of making a choice.

#### 4. Metrobus planner

##### 5.1.6. *Conflicting politics*

Although the planners had a positive experience communicating consequences related to budget and quality of service, they did experience that some information was difficult to deliver to the politicians: the importance of limiting the accessibility for the private car.

We have been rigorous when it comes to prioritizing in favor of public transport and not the private car in infrastructural matters. But we have not met much understanding for that... (laughter). If it's a right turn, we don't get to prioritize transit, because then the car can't pass and loses efficiency... So, the idea is that you should prioritize one person in his car over the 150 people sitting in the bus behind him... It is actually fully legalized in the system. There are many who do not even twitch their eyes when someone makes such a claim. It's a bit shocking then... when you think about how much you invest in promoting public transport and how many people travel by car. A full bus is 150 people, and they should have the same priority as the individual sitting in their car with a coffee cup and perfect comfort... We faced resistance when trying to prioritize transit several times.

#### 1. Metrobus planner

The interviewed planners in Trondheim touched upon the different ways of understanding objectives, problems, and knowledge when different organizations worked to create the New Route Structure in the Trondheim City Region project and the Metrobus project. Although the planners pointed out that there could be disagreement between different organizations, such differences were, according to the interviewed planners, resolved within the projects and did not harm the outcome of the projects in a major way. It was more crucial that there was reluctance among politicians to limit the accessibility for the private car, which is a clear political conflict. One of the interviewed planners tried to explain with the following statement how the politicians could both take part in working towards the zero-growth objective and be reluctant to limiting the private car:

Everyone agrees but has a different opinion of what the zero-growth goal is really about. It's not just about emissions; it's about the urban environment, noise, and dust. That politicians talk as if electric cars have no negative effects since they have no emissions.

#### 2. Route structure project planner

The planners themselves did express some doubt regarding the knowledge used and the measures made to increase transit competitiveness (and achieve the zero-growth objective). One of the planners was doubtful about the realism in the idea that the route structure could

lead to a large change in transport mode choices. This planner emphasized that trips taken by cars were often for purposes that created a need to use the private car, such as bringing a lot of baggage and weekly grocery shopping. All the planners who were interviewed pointed out that the land-use development had to become even more transit oriented if the route structure change and the Metrobus were to have a large impact on choice of transport mode. It was also stated that allowing a certain accessibility for the private car limits the possible effect of the projects.

#### 5.1.7. *Hamar*

**5.1.7.1. *Knowledge.*** In Hamar, the new transit system was based on the work of local planners and work produced by a hired consulting firm. The local planners contributed knowledge regarding local plans, local demand, how the existing transit service functioned, and other information and data regarding the local context, while the consulting firm contributed a detailed analysis of this information and strategic placement of the route structure.

The local transit planners were in good dialogue with Hamar municipality, and in addition to this they actively communicated with Hamar's neighboring municipalities about the planned changes and called for feedback. The motivation was to create an agreement among the municipalities on the plan for changes in the transit system. This communication did result in some changes in the location of routes going to and from Løten and Hamar, which provided commuters with a better transit service than before. The transit planners found that dialogue and communication with municipal planners in the city region and neighboring municipalities were quite useful. In the interviews, the planners stated that there was little disagreement about creating a route structure adapted to commuters between local centers and Hamar. There was also little disagreement on the fact that some areas did not have a large enough customer demand for transit because of the low number of inhabitants. Not prioritizing these areas when planning the new route structure was not considered provocative.

There was little that planners found to be less effectful than they hoped, one of the planners stated that they experienced surprisingly good effects from the changes they made in the route structure.

...really the other way around...that what we have done and tried, and gone a little further than what other cities have done perhaps, it has proven to work for us. Among other things, we have stretched out our city bus routes to 15 kilometers; in many other cities, the city bus routes are shorter. We have gone further, and for us, it worked out great. It builds on what we have learned from various books and other things, merging several routes into one route and increasing frequency and things like that. For us, it has been a huge success.

#### 1. Local transit planner

**5.1.7.2. *Collaboration.*** In the route structure design process, it was a challenge that land use development in Hamar's neighboring municipalities created an increase in transport towards the city from car-based suburban areas. It was made clear in the interview with the consultant that some of the routes in the route structure had to be located to serve developmental areas located in car-based areas far from the city center and other dense areas. It was stated in the interview (as above) that the consultant did not recommend such development. Taking the area of Ingeberg as an example (see Fig. 5). The demand for transit in this area is relatively low and it was said that due to this it was not possible to provide this area with a frequency higher than 2 departures per hour. The consultant pointed out that there was no reason to think that this particular route would positively contribute to an increase in the transit competitiveness versus the private car. The route was enabled with a



low frequency in order to ensure that routes that serviced areas with a higher demand could have a higher frequency. The consultant was honest about making compromises with the local planners when they pushed for a route structure design that was less efficient and more costly than what the consultant recommended. Still, the consultant also pointed out that they had a good dialogue and that the knowledge the consultants presented was well received.

In Hamar, I felt that we were well received, and in general, I feel that people [local planners/authorities] are happy to have a slightly more academic approach to it because there is lot of gut feeling and operational approach within this subject area. So, the fact that we came in with a kind of method and structure...I think many people [local planners/authorities] appreciate that. And then you have to remember that we sometimes become a kind of mediator between a county and a bus company, or a municipality, or the Norwegian Road Administration, or someone... Because you should not ignore that there are slightly different perspectives around the table. Often, our role is to contribute a bit with professional advice that creates a bit of a consensus that this is smart.

#### 1. Consultant

The consultant further explained that they would usually make an effort to emphasize strategies that would help to increase frequency and simplify the network when recommending changes to local planners and politicians. Such strategies lead to some customers losing their current transit service, but the consultant argued that the effect of such strategies mostly leads to a positive effect. It was pointed out in the interviews that although Hamar is a small city and there are challenges related to land use and accessibility for the private car, the consultant considered the recommended strategies to be successful, as they resulted in a frequency of four departures per hour for transit lines in prioritized axes.

It is absolutely impressive in a Norwegian context and considering it is a city of this size.

#### 2. Consultant

##### 5.1.8. *Conflicting politics*

When it comes to knowledge, and political conflicts, the local planners also made effort to distribute knowledge onto the local inhabitants and politicians. In Hamar, many local inhabitants are used to driving for multiple purposes and some were not even aware that there was a transit service that could meet their needs in relation to some trips. Due to this, the planners hired a person who worked with disseminating knowledge about the existence of the transit service to the local inhabitants. It became clear in the interviews that not only the local inhabitants needed to be informed about the perks and importance of transit services. The planners did problematize that establishing a common understanding among important local stakeholders such as politicians of what needs to be done locally to ensure a sustainable city development was an issue.

Around here, you can say that it is positive for us that both Hamar municipality and Hedmark county municipality have declared a climate crisis. It sounds very ambitious, and it remains to be seen if it is followed up... There's a long way between words and action... when you declare a climate crisis and then you work for more roads and cheaper transport... It feels a little frustrating from time to time...

#### 1. Local transit planner

The planners also mentioned examples of different ways of thinking about the climate crisis and how to reduce the use of the

private car. The first example was that, with a green environment and large forest areas, there was, at one time, a local debate about whether the region could be considered climate neutral because calculations showed that the local emissions were smaller than the net uptake of the local forest. Nevertheless, the climate perspective did become important in the local planning strategies.

...both Hedmark and Oppland have an objective of climate neutrality. Climate neutrality is probably a bit out of date after the Paris agreement, because the Paris agreement is not talking about climate neutrality, they are talking about emissions... So we got a climate calculation. Hedmark has been climate neutral for many years really... If you calculate net uptake in forests... we are almost in surplus... It was kind of a question of just shutting down the climate work... No, so the climate perspective is quite heavy in the strategy

#### 2. Chief of Transport

Strategies involving autonomous buses were mentioned as an example of "timely" testing of new technologies related to reducing the use of the private car and strengthening transit. The chief of transport stated that an autonomous bus was tested in Gjøvik, but the bus broke down and the project was terminated. Though skeptical about the idea that the new technological solutions would solve problems, the chief of transport explained that, due to the "timely" focus on such solutions, "deals have been made" with local tourism businesses for future projects.

A small film clip has been made from Mjøsbyen, a family who gets on the train with skis on their backs and then they get on a bus and are driven up to Sjusjøen with skis and a backpack and such. Maybe a little beyond what is realistic, but a little of the ambition is to develop these seamless transport systems. So the focus is there then.

#### 3. Chief of Transport

In general, the local planners were clearly positive to a continuous improvement of transit services. In spite of a large share of car drivers in the city region and car friendly decision-makers enabling free parking centrally in the city, the planners had experienced a large improvement in the use of transit locally. At the same time, one of the planners also pointed out that some inhabitants in the region lived or worked in areas where there was no reasonable way to provide a frequent, high-quality transit service. He added that investments should be made in areas where an increase in the use of transit was possible, and that it should be realistically acknowledged that it wasn't possible to provide transit to all inhabitants in all areas. At the same time, the planner pointed out that this was not prevailing practice, and called for conversations that could contribute to such a development locally.

In Hamar, some inhabitants live in such a way that the private car will be the most sensible, so you cannot have restrictive measures that go beyond what they can adapt to. But we can have restrictive measures in the right places for those who have options... I think that politically we cannot separate [areas]; it ends with no toll roads, no restrictions for car use without being able to recognize that there are different possibilities in different areas. Now, I don't have a good solution for how to do this, but we must at least dare to start talking about it in different groups.

#### 4. Local transit planner

The consultant who contributed to the transit project made it clear that the route structure planning was first and foremost about establishing a route structure that could provide service to the areas with the highest demand for transit and contribute to lowering the operative costs. According to the consultant, the route structure should have a location that could contribute to long-term city development. In Hamar, the city structure set the conditions for how

to locate the route structure, and the consultant pointed out that there were limits to what route structure location could do without land-use development being transit oriented. The locations of two shopping malls, one on the east side of the city center and one on its north side, as well as larger work-intensive businesses, set conditions for the locations of the transit routes.

Right...to run high frequency where the database showed that there was good potential high density in workplaces and residential areas. And then it was clear where the new route structure should be located, with high frequency on common stretches. And then the real question is how many lines you [local planners/authorities] want... what level of coverage you want. And there they [local planners/authorities] chose to go a little further themselves than we as consultants would have recommended them to do; [they] simply went on with an extra route at the end, which we thought was prudent not to include in the final solution. Thus, we tried to find a compromise in the end.

## 5. Consultant

### 5.2. What differences and similarities exist between the findings of a. and b.?

As found in the answer to research question (a), the transit plans accord to a great extent with what existing theories and case studies recommend, indicating that there is little reason to believe that unfavorable decisions are made mainly because of a lack of knowledge. When it comes to (b), the planners seemed to be well updated on what kind of analysis was needed to locate routes in areas in which it was most likely that they would be able to increase transit competitiveness. In line with theory, the most population-dense areas were selected and connected with routes that were as straight as possible to increase efficiency. When it comes to knowledge use, a considerable amount of information was provided in the interviews that is not included in theory regarding route structure planning but is partially included in previous planning process-oriented research on transit and urban planning projects. The interviews suggest that unfavorable decisions mostly occur as a result of political conflicts and a lack of collaboration. The lack of integrated land use and transport development, as well as the continuous prioritization of the private car, seems to be a problem in both case cities. The planners made an effort to explain to the politicians and decision-makers the causal effects of unfavorable decisions within land use and transport planning on transit competitiveness. The planning documents focus on transit and do not discuss these causal effects to a great extent; this is likely due to a sectorized planning system and limitations regarding how much a planning document should inform and discuss.

The answer to research question a) revealed that the planners had expert knowledge or had access to expert knowledge through consultants. The interviews and planning documents also revealed that the planners possessed the five types of knowledge mentioned in the theory section; Process knowledge [1], which is knowledge “about laws, regulations, and procedures of planning and decision-making defined in planning legislation; knowledge about how to carry out planning processes; knowledge about public participation in planning processes...; [2] knowledge regarding the projects in, and [3] the objectives of, a planning process... [4] knowledge regarding the specific context of the planning and the project” [, and [5] expert knowledge ” (Tennøy et al., 2016:2,3).

In both cities, the purpose of the analysis and the problems the planners aimed to solve are well described in the planning documents. The knowledge was used with the aim of creating a route structure that contributes to an increase in transit competitiveness. Identifying where the majority of potential customers live, work, go to school, and visit was important in the analysis, along with detecting how to design an efficient network. This is in line with theory and best practice.

### 5.2.1. Deviations from best practice and theory

- In Trondheim, the planners did not recommend the Metrobus to service Saupstadringen, which was not a good solution according to theory but was based on a political suggestion and decision. In Trondheim, there was also a struggle to ensure efficiency for the Metrobus in some parts of the Metrobus axes because politicians did not want to limit the accessibility and efficiency of the private car.
- In Hamar, consultants advised against a low-frequency line to the residential development site Ingeberg but ended up with a compromise there. This decision is, according to the planners, and theory, not in line with practice that can increase transit competitiveness.

### 5.2.2. Signs of co-action and bargaining

The interesting ways in which the planners used this knowledge illustrate a certain level of co-action (Hrelja et al., 2016; Petterson & Hrelja, 2018) and bargaining (Christensen, 1985) with politicians:

- In Trondheim, knowledge was used as a communicative tool when arguing for more funding. This was positive for transit competitiveness, as it led to a better final project outcome.
- In both cities, the planners made active decisions to describe findings from their analysis in a simpler manner to help politicians make better decisions, and they made an effort to clearly communicate the possible consequences and effects of different choices.
- The consultant in Hamar deliberately took a neutral mediating role and used expert knowledge to help negotiate when local actors could not agree upon strategies to increase transit competitiveness.
- In both cities, the planners described good collaboration among themselves, with the exception of the first project group in Trondheim. Once a “project culture” was established in Trondheim, the planners described good collaboration among planners from different sectors. Still, there were difficulties for the planners involved related to Metrobus project’s goals and values conflicting with their original workplace’s goals and values, as they did not always combine well. The Norwegian Road Administration was specifically mentioned in this regard.

In general, the planners in Trondheim aimed to inform politicians about the facts on which the planners’ professional recommendations were based. At the same time, it is important to acknowledge that the initial route structure planning document (AtB, 2016) had poor readability and was thus less suitable for decision-makers to dive into before making a decision. The knowledge used might be useful and understandable to planners but not to decision-makers. When the transit planners in Hamar (who were part of the county administration staff) problematized that the existing land use and city structure limited the possibility of creating a frequent, efficient transit service, they did not have the means to handle this, and they pointed out that land use is the responsibility of the municipality.

Even if the planners did experience good collaboration and shared values that could qualify the project groups for “co-action,” there is no evidence in this study indicating that there is total co-action among the different sectors affecting transit competitiveness (land use, transport, and transit planning).

### 5.2.3. Signs of conflicting politics

Land use and city structure are crucial factors that can make or break possibilities for transit planners to create a good transit service for a large part of the population. These are also factors that the transit planners have little power to do anything about, as the planning system is sectorized, and decision-makers continue to prioritize the private car and unfavorable land-use development. Transit is expected to adapt to land use regardless of how it is geographically distributed. Transit planners from both cities problematized this, as well as the local reluctance to limit the accessibility of the private car, at both the master-plan

**Table 6**  
Conflicting objectives collide with local knowledge (Christensen, 1985).

Measures Objectives	Known	Unknown
Agree (prioritizing increase in transit competitiveness)	<p><b>(A: Agreed on objective and known technology – certain outcomes)</b> Actors argue to increase transit competitiveness by:</p> <ul style="list-style-type: none"> <li>- a route structure that increases patronage</li> <li>- transit oriented dense and concentrated urban structure</li> </ul> <p>Premature consensus: The politicians ignore conflicting objectives knowingly or unknowingly (box C) due to sectorized planning system, and falsely moves the situation to A.</p>	<p><b>(B: Agreed on objective but unknown technology – innovation/experimentation)</b> Actors argue to increase transit competitiveness, the following measures are discussed but not proven to be helpful:</p> <ol style="list-style-type: none"> <li>1. They invest in multimodality</li> <li>2. Self driving cars</li> <li>3. A belief that E -cars solves the zero-growth objective too</li> <li>4. No order for land use development is adopted – leads to lack of important context knowledge necessary for designing a competitive route structure in some areas</li> </ol>
Disagree (prioritizing other objectives than increase in transit competitiveness)	<p><b>(C: Conflicting objectives and known measures – Bargaining or ignoring problem through sectorized planning)</b> Actors agree in the knowledge about how transit competitiveness can be promoted but think other concerns, such as those of “the secret transport policy”, and outspoken objectives such as economic growth, and suburban development with single house dwellings etc., are more important and therefore promote:</p> <ul style="list-style-type: none"> <li>-a route structure that increases coverage</li> </ul> <ol style="list-style-type: none"> <li>1. suburban development with more single-family houses</li> <li>2. accessibility for car maintained in main transit axes</li> </ol> <p>As a response to conflicting objectives, the planners in both cities point to uncertainties resulting from these conflicting objectives and the related measures. They have initiated bargaining processes with the politicians</p> <p>Possibly premature consensus: Sectorized planning, whereby the county is responsible for transit, the municipality is responsible for land use, and the NRA (state) is responsible for road planning, creates the opportunity for politicians to knowingly/unknowingly ignore the conflicting objectives</p>	<p><b>(D: Disagreed objectives and unknown measures)</b> Disagreement on both objectives and measures, according to Christensen this leads to chaos unless the problems can be identified and a process can be started to find a technology that can solve the problem. If a problem is identified, the issue is moved to B, where innovation can happen.</p>

level (large road projects) and the zoning-plan level (roundabouts, lanes, right of way, and signage).

### 5.3. How does the findings differ between the two case cities?

Although the sizes of the two case cities are different, the findings do not differ much. In Trondheim, the planners seem to make an effort to influence politicians to make decisions in favor of the planned project. In Hamar, this kind of agency was not an issue in the interviews; still, the consultant aimed to provide good, academically based recommendations to local stakeholders. In both cities, planners have done a good job in terms of choosing different types of analysis and data to design an as good as possible transit route structure, considering that the aim of these projects is to increase transit competitiveness.

In both cities, there is a reluctance to limit the private car even though local objectives aim to reduce the use of the private car. This is evident from the findings section for both case cities. There are also tendencies of sprawl and inefficient location of routes due to this. It seems like local decision-makers have a hard time to understand the consequences of their decisions, or that they have a hard time prioritizing what is more important. This is in spite of the efforts of planners to inform the politicians on detected uncertainty about the outcome of the transit projects due to politically laden prioritization and decisions. This especially pertains to the politicians' wish to ensure the accessibility for the private car, and the unfavorable (for transit competitiveness) land use planning.

### 5.4. What role did knowledge, collaboration and conflicting politics play when suboptimal or unfavorable solutions were chosen?

It is very clear from the findings concerning the previous research questions that use of knowledge was to some degree affected by power, as knowledge was disregarded or overlooked for the benefit of other prioritization. In both cities, the planners informed the politicians that the transit projects would have uncertain outcomes owing to the

emphasis on accessibility for the private car and because transit was expected to adapt to unfavorable land-use development. Based on the decisions made despite this information, it is clear that the politicians either evaluated that they could handle these uncertain outcomes of the transit projects, and/or that they found other objectives as more important. Although there were initially some problems related to collaboration among the planners in Trondheim, these were resolved and did not affect the results of the planning practice in the project. In Hamar, there was a good collaborative milieu, and interestingly the consultant had a mediatory role in providing knowledge-based recommendations. Some of the consultant's recommendations were, according to the planners and the consultant, not used due to the politicians making other priorities. The most important reason for unfavorable decisions therefore seems to be political conflicts, in both cities, which makes the use of Christensen's (1985) interpretation table relevant to this work.

Table 6 illustrates information provided in the interviews and planning documents, indicating that it is difficult to place the planning project situations in the two cities in just one box without discussing the matter. First, it can be stated that it is difficult to argue that the planning situations in the cities fit the requirements of not agreeing on objectives and not knowing effectual measures (D). From the interviews and planning documents, it is very clear that there is an agreement that one should increase transit competitiveness (objective) and that planners are updated on what kind of measures are necessary to achieve this objective. The politicians are eager to invest in these measures. When this is seen in isolation, it can be argued that the planning situations meet the requirements of agreeing on objectives and knowing effectual measures (A).

The interviews revealed that the reality is not this simple. When presenting known measures, such as good route structure design, there is, according to the planners, a political reluctance to match actions to the defined objectives. In Trondheim, they wrongly state that the zero-growth objective can be met by giving e-cars accessibility, because they have no emissions. In Hamar, there were, at one time, discussions

revolving around climate neutrality and “timely” projects in which autonomous vehicles were tested, though without being part of the defined strategies. The effect of these measures—or ways of thinking about “climate neutrality,” for that matter—in small and medium-sized cities is still not sufficiently proven, so some may argue that the planning situations might meet the requirements of the agreement on objectives and unknown measures (B).

Still, box B does not entirely describe the situations presented in the interviews and documents. Unfavorable decisions in the transit planning projects are, based on the interviews, due to politicians disregarding planners’ recommendations. Politicians either knowingly or due to premature consensus prioritize solutions that enhance the accessibility and need (through unfavorable land-use development) for the private car. The politicians thereby bring uncertainty to the outcomes of the transit projects in which they so willingly invested.

The knowledge used by planning professionals was in accordance with theory and best-practice guides. It is clear from the interviews that unfavorable solutions mostly occur in situations in which politicians are eager to invest in transit competitiveness, ensure certain accessibility for the private car, and allow land-use development that creates areas that transit cannot provide with a competitive service. These situations are indications of what must be regarded as disagreement on objectives and known measures (C). Christensen (1985) states that planners meet these situations either by pointing to the problem hindering goal achievement and initiate bargaining processes, or that such problems are met at an administrative level where a sectorization of planners keeps conflicting planning practices and objectives undetectable “to avoid conflict and need for resolution” (Christensen, 1985:68).

The findings from the interviews show that planners meet the situation (C) by pointing to the problem that brings uncertainty and initiating bargaining processes, which is according to what Christensen (1985) would recognize as planners’ responsibility. Still, it should be pointed out here that in Norway, planning is sectorized in a manner that does separate road planning, land use planning and transit planning, which triggers the possibility for premature consensus (ignore conflicting objectives).

It is clear that in Trondheim, the planners addressed the issue of conflicting objectives by initiating a process where the aim was not really to bargain but to educate the politicians. This worked for funding but not for limiting the accessibility for the private car or to avoid establishing less efficient transit routes. To what degree this really was a bargain where funding of the project made unfavorable decisions tolerable for the planners is uncertain, and there is no evidence in the interviews that such a bargain was consciously made. Here, the politicians were presented with different possible outcomes related to the budget, and they decided that they were not comfortable with the uncertainties demonstrated in relation to the lowest budget. As a result, the budget for the Metrobus project was increased. The politicians did not respond this way when presented with uncertainties related to the Metrobus servicing Saupstadringen, or with prioritizing the accessibility for the private car in some parts of the Metrobus main axes. In Hamar, the consultant used knowledge as a tool in a negotiating role between the sectorized stakeholders who in relation to different responsibilities had difficulties to find a common ground. In this case, the consultant argued that this did have an effect but also revealed that a compromise had to be made when it came to the location of a less efficient transit route. This compromise could be interpreted as the result of a bargaining process, whereby the decision-makers and politicians decided to accept the uncertainty of a low-frequency route to a low-density area.

Based on the interpretation table, unfavorable choices are made in spite of both known and implemented measures to increase transit competitiveness due to conflicting objectives. In spite of sectorized planning in these cities, collaboration was initiated among the planners working in the planning projects and bargaining processes were initiated by them in contact with politicians in both cities with an aim to solve emerging problems and uncertainty they could identify. The uncertainty

emerged due to the conflicting objectives (such as accessibility for the private car, and low density housing in suburbia) and the unfavorable choices made in the transit planning happened when politicians and other stakeholders were reluctant to meet planners’ recommendations to prioritize transit. Based on Christensen’s (1985) interpretation table, it can be concluded that the actual situation in the cities—that is, investing in transit while maintaining accessibility for the private car and planning unfavorable land use—fits with the category of known measures and conflicting objectives (C). At the same time, the practice of both investing heavily in transit and in conflicting measures can be a symptom of premature consensus (false A). The sectorized and segmented planning system makes conflicts easier to ignore.

So, is this a box C situation or a situation of box A due to premature consensus? The planning situations in both cities can be interpreted as box C, and the planners act according to how they should in such a situation. Still, the planners do not seem to sufficiently succeed in informing decision-makers and politicians about the uncertainties that emerge because of the conflicting objectives and practices. When it comes to the decisions that are actually being made, practice is more along the lines of premature consensus. The conflicting objectives are met with known measures, and the uncertainties related to the outcome of initiating counteractive measures are ignored in spite of planners’ efforts to inform decision-makers and politicians.

## 6. Discussion

### 6.1. Knowledgeable, communicating planners

First, it is clear that both cities have recognized that there is a problem related to an increase in transport demand and that this increase cannot be covered by the private car alone owing to the negative effects of car driving in urban areas. In both case cities, there are also adopted objectives about increasing transit competitiveness and reducing the use of the private car. Based solely on this information, it might be concluded that there is agreement on the defined objective to increase transit competitiveness and that something should be done about it. However, this does not mean that there is reason enough to qualify the situation as belonging to Christensen’s (1985) box A. This would require an agreement among stakeholders regarding what measures should be made to increase transit competitiveness, and that these objectives were prioritized at the expense of other objectives that pull towards more car use. According to Petterson and Hrelja (2018), to do so, there must be co-action, which requires an agreement on important sets of values to do so successfully.

According to the interviews, the planners agreed among themselves and could meet many of Petterson and Hrelja’s co-action requirements (Fig. 1). The exception is the first project group in Trondheim. After this group was replaced, knowledge gaps were filled by the new project group, and necessary changes were made, leading to a better result. According to Petterson and Hrelja (2018), co-action is crucial to increasing the possibility of creating good transit systems, and based on the interviews, it seems that the planners involved in the planning process found the collaboration among themselves to be good. Based on knowledge and analysis, the planners produced plans that were seemingly in accordance with what theory and best practice recommend to make transit systems competitive. Judged from the quality of the planners’ work, it can be concluded that the planners were able to act together, even though the interviews did mention some hiccups related to different stakeholders’ “culture and traditions”. Which can be a direct, but in these cases minor affect (on the quality of work) of a sectorized planning system, which is mentioned as a challenge especially in relation to transit planning (Hrelja et al., 2020).

In the interviews and in the planning documents it is very clear that the planners are well equipped when it comes to different types of knowledge (Tennøy, 2012; Tennøy et al. 2019), and they produce plans that according to theory should be able to contribute to goal

achievement when implemented. The planners used their: 1) *process knowledge* by attempting to present and write their case presentations and knowledge base in specific ways in specific fora; they used their 2) knowledge regarding *how to carry out the planning process* by identifying important challenges related to collaboration, budgets, and timelines for the formalities of the planning processes; and 3) *knowledge regarding participation* by including neighboring municipalities and recognizing important demographics and land-use functions when designing the transit service. Participation was also secured by meeting official requirements for participation in the planning process. This was documented in case descriptions and planning documents. The planners also used their 4) *knowledge regarding the project and defined objectives* to argue for better solutions (Hamar and Trondheim) and budgets (Trondheim); they used their 5) *knowledge regarding the specific contexts*, both physical, financial and political; and they used their *expert knowledge* by both performing analysis themselves they found where missing, and by hiring consultants to do the work they themselves (local planners) could not do, but knew they needed. The most interesting use of knowledge in the case cities is the use of knowledge to communicate need for funding, to communicate what would be a better solution and why, and use knowledge as a negotiating tool to make local stakeholders, decisionmakers and politicians understand what would be the best strategies to achieve their objectives.

As previously stated, the result of all of this knowledge was plans and documentation in accordance with theory and best-practice recommendations. Although not all the planning documents have reference lists, the concepts are similar and are clearly inspired by best-practice guides. The work of the local planners in both Hamar and Trondheim uses illustrations that are identical to those used in the best-practice guide *Public Transport: Planning the Networks* (Nielsen et al., 2005) and in *Network Design for Public Transport Success: Theory and Examples* (Nielsen & Lange, 2008). It is evident that they have used other published guides as well (Nielsen & Lange, 2015; Ruter, 2015, 2017) in addition to local guidelines (AtB, 2016; Hedmark County, 2017; Hedmark Trafikk, 2018; Trøndelag County, 2018a). Although best-practice recommendations have not been found to be directly transferable to any context, especially that of small cities (Skartland, forthcoming), they are in fact what planners have at hand besides practical experience. Using best-practice guides, reference studies, and theory that they know of and referring to it in the planning documents provides a knowledge base that is based upon verifiable work. It is not a mystical black box template. In Trondheim, one of the planners even made the extra effort to redesign the case presentation to make it clear and readable because she found the initial work to be too complex for laypeople. It is very clear in the planning documents and in the interviews that the planners made it their business to provide decision-makers with high-quality, readable information for them to base their decisions on.

## 6.2. The planners take the responsibility to inform

Based on the work the planners did, and the knowledge they possess, it is clear that the planners took responsibility (as Christensen argues is planners responsibility), and made efforts to explain to decision-makers/politicians the consequences of their choices. Still, unfavorable decisions do occur in the cases for reasons that are not attributable to planners' level of knowledge. The planners are well aware that the urban structure sets a strong boundary to what is possible to achieve when planning transit competitiveness, because competitiveness is mainly possible in dense areas with high demand, unless politicians decide to subsidize transit generously. The planners also know that the use of the private car is not dependent on a certain location of land use functions or population density. The private car is efficient and can be frequently used by the owner at any time the car owner wants to use it. Indeed, the least favorable conditions for car driving are precisely in the dense and central areas in which transit competitiveness is at its best and the conditions for driving are at their worst. Owing to this, the built

environment can enhance or limit transit competitiveness versus the private car.

Based on the interviews, these are issues that planners struggle to communicate to decision-makers and politicians. However, they make efforts to communicate the consequences of conflicting practices and objectives, and they actively use knowledge to do so. Conflicting objectives due to local politics, goals, economy, the organization of different sectors, power play, and the use of knowledge can affect the urban structure and built environment as measures are implemented over time. As measures are implemented to achieve more or less official objectives, such as "more cabin tourists, more tax payers, increased mobility and more efficient roads," which support increasing the accessibility of the private car and land-use development in suburban areas, transit competitiveness consequently suffers. This is because it is mainly possible to increase transit competitiveness in certain types of areas.

Based on the findings and the discussion above, the use of knowledge within planning practice does not seem to be more important than other factors related to planning practice (objectives, power, politics, economy, the organization of stakeholders, and the level of stakeholder collaboration). Moreover, based on previous research literature and this work, the impact of the knowledge used is clearly affected by these factors.

## 6.3. Conflicting politics or premature consensus?

Using Christensen's (1985) interpretation table has been useful in this work as it offered a framework for discussing whether unfavorable decisions were due to lack of knowledge or conflicting politics. As stated, and discussed in the sub-section on findings for research question number four, it is of course possible to interpret planning situations in different ways, depending on how you approach and define agreement on objectives and known measures. Some would define all planning situations as uncertain because there is always some disagreement regarding what to do and how to do it within both politics and science. Christensen recognizes this in her work. As urban planning is an interdisciplinary field of work as well as field of research, disagreement on how to solve problems is not uncommon. Christensen's (1985) table does provide the possibility to interpret planning situations as either box A, B, C or D, depending on which planners are involved in the process, and what kind of political climate is being interpreted. Conflicting objectives are somewhat always coexisting within urban development, and as explained in the theory section, agreement is not necessarily based upon unanimous decisions but, rather, on majority decisions. As this is a case study on transit planning and the goal of increasing transit competitiveness, conflicting objectives were easily identified, and a consensus on measures to achieve transit competitiveness was found in the data from the interviews and document studies. Additionally, based on the data and on theory and best-practice recommendations, it was also possible to detect unfavorable decisions and conflicting objectives that led to uncertainties about the outcome of transit projects. In this case study, and with the data this case study is based upon, the use of Christensen's (1985) table made it possible to point out the possible existence of premature consensus among decision-makers and politicians, and it also made it possible to discuss the planners' detection of conflicting objectives in plans, and shed light on "the secret transport policy" and the dominant path.

Based on the interviews, it is clear that the transit planners can detect conflicting objectives because they know that land-use development in suburban areas and accessibility for the private car can affect transit competitiveness. It is not certain whether politicians/decision-makers possess this knowledge, which in a sectorized planning system makes them prone to premature consensus.

According to Christensen (1985), unfavorable solutions due to involvement by politicians/decisionmakers aiming to meet other goals can be due to either conscious, politically laden choices (box C: known

measures, disagreement on objective), or that they, due to a sectorized system, are able to ignore (knowingly or unknowingly) conflicting objectives, which qualify to premature consensus, which is a false interpretation of the situation as belonging to box A (agree on objective and measures are known). It is possible that politicians believe that compromise solutions (investing in measures that are meant to achieve conflicting objectives) are necessary for attracting funding. For instance, in Hamar, where politicians want to build more roads as well as to invest in transit. This can be a result of premature consensus, and also a clear sign that premature consensus can be economically fruitful for local authorities such as counties and municipalities.

In the case cities' master plans and transit planning documents, the accessibility for the private car is ignored, and land use is something that transit should adapt to. Owing to this, it is easy when looking only at the transit planning documents to interpret the planning situation as illustrated in box A, Table 2 and Table 6. The goals to increase transit competitiveness and have zero growth in the use of the private car are agreed upon and are neatly combined with measures that are known to help achieve these objectives. According to Christensen (1985), this can be a symptom of ignoring "political choices and tradeoffs" (Christensen, 1985:70). These are included in box C, Table 2 and Table 6. Due to the information provided in the interviews with the planners, there were reasons to place the transit planning situation in box C, where there is agreement on measures but not objectives. The reason is that although the politicians are willing to invest in the measures to increase transit competitiveness, they are not eager to control land use development or limit the accessibility for the private car, according to the planners. These priorities can only be considered to be driven by political purposes.

Based on the fact that the zero growth objective for car traffic has been adopted, and that the climate crisis is considered to be real by most Norwegian politicians, it is difficult to argue that their unfavorable choices (related to transit projects, transport and land use development) are due to the politicians not wanting a sustainable urban development. That said, there seem to be many ways of interpreting sustainable development, and politicians, decision-makers, and even planners can have different ways of defining it. The term is very positively laden, and since the term was introduced in 1987 by the Brundtland commission, there are several indications that the meaning of the term has been watered down (Næss, 2001). Speaking of objectives and measures, it could be that the politicians are suffering from simply wanting too much, which is a well-known human trade, and is arguably a motor of the climate crisis. Another possible reason for the unfavorable choices is, in spite of the effort of planners, lack of insight into the causal relationship between transport mode choices and the urban structure due to a sectorized planning system. In a sectorized planning system, causal relationships between urban structure and transport might be difficult to illustrate, and as mentioned, even in the master plans, conflicting measures and objectives are presented without this being problematized.

Christensen (1985) explains that "premature consensus" occurs when "the segmented specialization [e.g., transit planning, road planning and land-use planning in Norway] skews democratic access and curtails debates specialties in such a way that each specialty's goal appears acceptable [box A] instead of being treated as political choices and tradeoffs [box C]" (Christensen, 1985:70). Now, this is obviously not the case considering the planners' perspective, but taking into account the planning documents the politicians are presented with when making decisions, and the sectorized planning in Norway, it might not be controversial to suggest that politicians might be suffering from a premature consensus. This could also help explain why they so willingly invest in transit projects and simultaneously sabotage the possible positive effects of these investments by building more roads and allowing residential development in suburban, car-based areas.

Christensen argues that when premature consensus or conflicting politics occur, planners should treat this as "a symptom of

uncertainty" (Christensen, 1985:70) and make an effort to solve the problems that prevail due to the conflicting measures that might be initiated. The planners in Hamar and Trondheim have definitely defined the conflicting practice of investing in conflicting measures as "symptoms of uncertainty" (Christensen, 1985:70) which might reduce the positive effects of the transit projects. To counteract this, they made efforts, such as designing case descriptions in an understandable manner, assuming a negotiating role, and making an effort to explain to the politicians the consequences of their choices. Considering that the politicians have nevertheless contributed to unfavorable decisions, it might be that they are aware of the negative effects of their actions on transit competitiveness but choose to take them anyway. Either way, with a sectorized planning system, all goals can be met with supporting measures, and as this helps "avoid conflict and need for resolution" (Christensen, 1985:68), it is a possible explanation for why politicians knowingly make decisions that are unfavorable, seen from a perspective of transit competitiveness. It can be questioned how long, considering an increased engagement in, and awareness of the need for a sustainable development among voters, planners, and even political parties, conflict and need for resolution will be avoided.

#### 6.4. Power and a secret transport policy

As the knowledge base of the projects is quite good and the collaboration among planners is good, it is clear that conflicting politics plays a strong role when unfavorable choices are made in transit planning. There are clear signs of a "secret transport policy" in the case cities. Transport is not recognized as a limited resource. According to the planners, the politicians are not eager to let transit be prioritized and the accessibility for the private car to be limited. The planners also explain that politicians also use their power to ensure a continuous accessibility for the private car, and they expect transit to adapt to any kind of land-use development. This means that the politicians do not make it possible to implement the policy needed to phase out the "secret transport policy," which actually pulls in the opposite direction of the officially adopted goals. In some areas in the case cities, it is possible to (1) live without a car. Still, it is not possible to (2) let inhabitants pay for driving their cars to the extent that they do not have to feel guilty. Because the cost of driving a car is acceptable for most inhabitants and because of the local culture, most of them are not likely to feel guilty. As transit is forced to be developed in an unfavorable manner (compared to what is actually possible), (3) alternatives to the private car are limited. This means that owing to conflicting politics, be they due to conscious choices or premature consensus, unfavorable decisions limit the possibility of increasing transit competitiveness to a great extent in the case cities.

#### 6.5. Signs of the dominant paths in Hamar and Trondheim

Interpreting the situations in which unfavorable decisions were made, the current state of transit, and the use and accessibility of the private car in these cities, it is clear that accessibility for the private car and market-sensitive residential development are valued. Additionally, there seems to be an expectation among politicians that the transit can follow and adapt to any kind of land-use and transport development in some cases. It is positive to register that local planners and consultants actively assume the roles of educators and negotiators to find the best possible solutions to increase transit competitiveness. At the same time it is very clear that if decision-makers and politicians do not learn the consequences of sabotaging their own investments in measures meant to help reach the zero-growth objective and increasing transit competitiveness, the chance of achieving these goals is very limited in spite of good collaboration, good use of knowledge and use of best practice transit in transit planning.

It is somewhat unfair to blame local politicians personally for making unfavorable choices and sabotaging transit projects. The dominant path

in Norway is still predominantly car-friendly, and the politicians are agents in a rigid system. This means that due to path dependency, there is a practice and existing discourses and mechanisms that are continuously favoring the implementation, funding, and prioritization of projects that ensure a certain accessibility for the private car, thus limiting the positive effects of investments in transit. As mentioned in the theory section, according to the studies discussing path dependency in relation to transit and sustainable mobility, as well as the continuous prioritization of the private car (Fenton, 2016; Low & Astle, 2009), the dominant path is hard to change. Therefore, change is likely to be incremental. This is a solution that has been criticized (Næss, 2001). According to Næss (2001), incremental changes can be a positive contribution to sustainable development only if they are the first steps on a pathway that is consistent with long-term sustainability objectives. If they are not, incremental processes can lead in directions other than those that the objectives call for, because in incremental planning, objectives, plans, and easy-to-implement measures are chosen simultaneously and adapted to each other. Owing to this, short-term goals and measures are prioritized, while long-term objectives and in-depth analyses do not fit this mode of action.

Næss (2001) brings up several possible ways in which planners can initiate change to help make urban planning contribute to more sustainable development and argues for more democratic, transparent, knowledge-based, and knowledge-distributing planning practice. Conflicting objectives and practice should be met through alliance building. According to Næss, local planners should point out consequences, and alternative plans should be considered based on what is more likely to contribute to the most important goals. The planners should make plan alternatives that contribute to sustainable development and initiate debates with decision-makers, the local administration, and the inhabitants of their city. For this to be possible, the system has to enable planners to do this without being afraid of losing their jobs or losing respect in the workplace. Further, it is argued that there should be a transparent debate and democratic decisions made regarding strategic land use and transport master plans. According to Næss (2001), for such a system to contribute to more sustainable development, inhabitants, decision-makers, and probably some planners must change their values:

*If most people do not prioritize nature and environment values more strongly than is done today, a government or a municipal council attempting to implement an ecologically defensible and globally solidary urban development will quickly lose its legitimacy. In a sustainability perspective, it is therefore highly desirable with planning processes that can contribute to a higher environmental awareness and responsibility. (Næss, 2001:518)*

Næss (2001) also states that it can be considered a challenge for planners to communicate the likely effects of different measures. As stated earlier, the sectorized planning system may contribute to difficulties in demonstrating the causal relationships between urban structure and transport modes. Such envisaging is likely necessary to limit the number of unfavorable decisions in transit planning (and planning for sustainable cities in general). Showing how measures that improve transit and measures that induce car use counteract each other, is important to help decision-makers understand that in order to achieve the zero-growth objective, increase transit competitiveness and reduce the use of the private car, they simply have to stop making decisions counteracting the achievement of these goals.

#### 6.6. Unfavorable decisions due to a lack of illumination of causal mechanisms?

If what is missing to limit unfavorable decisions is an illumination of causal relationships, this means that a type of knowledge is missing, or at least not clearly communicated in documents and case descriptions that politicians are presented with. In the interviews, it became clear that the

planners made effort to communicate how unfavorable land use and continuous prioritization of the private car would limit the effect of the transit projects. Still, it was not clear from the planning documents or the interviews that these objections were delivered in another way, apart from in meetings and discussions. It seems as though the planners possess the necessary contextual and expert knowledge about causal relationships between urban structure and transport. However, they do not demonstrate this knowledge sufficiently. It should also be mentioned here that criticism related to previous case studies of the route structure planning processes in the case cities (Skartland, 2021, Forthcoming) found that best practice theory in transit route structure planning has its limits. It does not provide any information or guidelines that can help transit planners demonstrate causal relationships between urban structure and transit competitiveness. It is likely that demonstrating these causal mechanisms is a step towards a better explanation for decision-makers and politicians on how their decisions on land use and other transport projects affects the competitive relationship between the private car and transit. In a society where the goal is to reduce the use of the private car and increase transit competitiveness, this is an important knowledge gap which should be filled if unfavorable decisions in transit planning is to be limited. Such illuminations will hopefully contribute to an improvement in politicians' and decision-makers' understanding of the problems they are dealing with, and in time provide evidence that investing in transit can be very beneficial and effective, if the private car is limited and land use development is transit oriented.

Based on the findings in this work, it can be stated that few plans can illuminate and explain the causal mechanisms between urban structure and transport, despite the fact that there is a bulk of research showing how urban structure and transport affect each other. Based on this work and previous research on transit and decision-making, it can also be stated that a sectorized planning system counteracts the possibility to do illuminate the causal relationships between land use, transport and transit competitiveness. It is not certain if politicians are knowingly making unfavorable decisions, or knowingly prioritizing the private car, or if they are victims of premature consensus or just following the dominant car friendly path. Either way, within any of the alternatives mentioned, it is unlikely that decisionmakers and politicians will call for illumination of causal mechanisms. If they are knowingly making decisions that counteract the politically adopted goals, they probably do not want to have such knowledge brought to the table, and if they are suffering from premature consensus or merely following the dominant car-friendly path, they do not even know that they need a demonstration of these causal mechanisms. This leaves the responsibility for bringing the missing knowledge to the table to planning practitioners and academics.

To illuminate the relationship between land use, transport, and transit, which decision-makers and politicians might not want or do not know they want, calls for a special kind of effort from planners and academics. According to Christensen (1985) and Næss (2001), informing is the responsibility of planners. If the responsibility to inform lies with planning practitioners and academics, they might also have to take the responsibility to awaken the need for an illumination of the causal relationship between urban structure and transport, as this need is not necessarily awakened by politicians and decision-makers themselves. This should be done with such an impact that it further awakens interest in finding out how to implement this knowledge in the planning processes of plans that are meant to increase transit competitiveness.

Arguably, planners' responsibility is not only to detect, inform about, and illuminate problems and uncertainty. When recognizing problems and uncertainty, they also have a responsibility to awaken the need for illumination of how to solve the problem or limit uncertainty if the politicians and decision-makers themselves either do not want or do not know they need this knowledge. Awakening such a need can help solve or at least illuminate the problems and uncertainties that stakeholders and politicians either deliberately ignore or do not detect. For instance, when planners in Hamar and Trondheim struggled with politicians

making transit-unfavorable decisions (knowingly or unknowingly) after they adopted the plans for the changes in the transit systems, they should not only have pointed out the problem in hindsight of presenting their case in response to the politicians' unfavorable suggestions. They should also have met the suggested changes with a clear statement and illumination of how the suggested changes will likely weaken the desired outcome of the changes in the transit system. It is arguably not enough that planners state that an unfavorable suggestion is not in line with what they would recommend. By compromising on solutions developed to deliver a politically desired outcome in response to politicians' subsequent involvement, planners are (in some cases) doing a disfavor to the politicians who initially adopted the plan and measures to achieve a certain objective. Considering that this is a practice that easily happens without inhabitants being aware of it, it could also be interpreted as a disfavor to inhabitants, because the decision-making is no longer made by sufficiently informed politicians, and inhabitants have not had the chance to participate (Vedung, 2009).

### 6.7. Awaken the need for illuminating causal mechanisms

It is important to recognize that people have varying degrees of access to and unfortunately interest in knowledge. Therefore, it can be thought of as merchandise that we (planners and researchers) want to produce and distribute. In particular, we want politicians and decision-makers to need and want knowledge and the application of it, as they fund and demand our knowledge production. We also want inhabitants to have access to our knowledge so that they can participate in planning processes as fairly as possible and understand the consequences of the decisions that politicians and decision-makers make on their behalf. Still, based on the findings of this work, planners and practitioners are terrible salespeople. To further explain what I mean by this and by creating a need for illumination (of the causal relationship between land use, transport, and transit competitiveness), I will use a personal experience from working at a clothing store as a student. My example may stir some readers' moral compasses, but it is used for the greater good (in this case, to increase transit competitiveness versus the private car).

To become a good salesperson, I had to learn two important lessons: (1) *adapt your character traits*, and (2) *the customer is always right*. For me, (1) was necessary because I was a young introvert with a strong sense of morality. I did not want to force customers to purchase products that they did not want to buy. I recognized that the product was expensive and that it should not be bought before the customer thought it through. If a customer stated that a dress was expensive, I would eagerly agree. These character traits were terrible for the salesperson job, and I initially sold products solely to the few customers who had decided what to purchase days before coming to the store. This led the owner of the store to thoughtfully give me the following advice: "*While you are at work, just pretend to be someone else.*" I took the advice, and for the hours I spent working at the store, I decided to be outgoing and extroverted and to push products on my customers. This technique worked wonderfully. It led me to meet the budget every single day. I even got promoted.

The transferability of (1)—that is, *adapt your character traits*—is that for planners and academics to create a sense of need or want in decision-makers and practitioners, they need to add "salesperson" to their list of character traits. Green parties that are already eager to invest in sustainable development are an important customer group, but the need for the illumination of knowledge that would be required in order to design solutions contributing to goal achievement should be awakened in any party regardless of political convictions. To create a need in people is difficult. Historically, only systems of belief, such as religion, ideologies, and other schools of thought, have had the power to change values, morals, and needs on a grand scale. Religious leaders usually do this through a combination of promising doom and offering salvation. Although the climate crisis does promise doom, science can offer salvation, and the media can provide an alternative Jesus, a religious approach is not a likely alternative to awaken a need or change of values

among politicians and decisionmakers. Still, it should be recognized that salespeople can, at times, cause people to deviate from their originally held morals and values and awaken needs. This is the link to an alternative interpretation of (2): *The customer is always right*.

There are several ways to interpret the term *the customer is always right*. Many would perceive this as leading to customers getting their money back or, in this context, may understand it to mean that the politicians are right to do what they want. This is not the interpretation presented here. *The customer is always right* can alternatively be interpreted as the fishing line that any salesperson would be smart to follow, as the customer has thrown it into the store. Therefore, when a customer tried on a French silk dress that she really loved and it was way too small for her, it was my job as a salesperson to recognize that she loved the garment, to point out to her that French sizes are very small, and to inform her that she could absolutely wear it like a T-shirt. This is also how I sold fur coats in June. When the customer pointed out that she loved the coat, but it was June, we both knew winter was coming. All I had to do was to focus on the fact that she loved the garment, and the fact that winter happens every year.

Therefore, when politicians and decision-makers say that they really want to invest in projects that can contribute to achieving the zero-growth objective (in practice, to increase the competitiveness of transit versus the private car), planners and academics should make it their business to state that the decision-makers and politicians are quite right about adopting such an objective. The planners should then make it very clear to the decision-makers and politicians that to achieve the objective, they *need* an illumination of the complex knowledge of causal mechanisms between urban structure and transport, as well as an envisaging of the possible effects of urban planning. This is the only way they can be informed enough to make decisions that lead to goal achievement. This statement can be considered naïve; still, it is difficult to argue for an alternative approach. It is very clear that the decision-makers and politicians are either misinformed or are simply not interested in the information that the planners have attempted to provide through presentations and planning documents. It is also very clear that the message does not come across. Considering the findings from interviews regarding planning practice and the documents that are examined in this work, it is somewhat surprising that the zero-growth objective is at all adopted. One might also wonder whether it would have been adopted if the decision-makers had known what kind of action the objective actually demand.

Based on this work and previous research, the responsibility of planners and academics is arguably not solely to recognize the problem, inform, and illuminate it. They should also adopt the salesperson character trait, grab the politicians' "willing to invest in zero-growth and sustainable development" fishing line that is thrown into their (and our) offices, and create a need for illumination and envisaging that can inform decision-makers and preferably inhabitants as well. To prioritize well, politicians and decision-makers need to know about causal mechanisms between urban structures and transport mode use, and how these mechanisms can be ignited and lead to goal achievement through strategic urban planning. Over time and with repetition, this might contribute to creating a large-scale demand, even change of values and hopefully smarter and better-informed decisions. If this doesn't work, we can try religion.

## 7. Conclusion

**1. When do unfavorable choices in transit planning occur, and how do use of knowledge, collaboration, and political conflicts related to route-change planning projects affect the possibility of increasing public transit competitiveness?**

**a. Is the knowledge used in accordance with what existing theories and case studies recommend?**

The types of knowledge used in the projects were in line with the



existing theories and case studies and will, according to theory, contribute to increasing transit competitiveness.

**b. What causes unfavorable choices in transit planning according to the planners**

According to planners and practitioners, unfavorable decisions occur when politicians' and decision-makers' involvement leads to changes after a plan or measure is adopted. Politics has the power to override planners' knowledge-based recommendations, leading to increased coverage and less frequency in some areas, as well as the prioritization of the accessibility for the private car. Increased coverage and a lower frequency are also a consequence of unfavorable land use development. There is little a transit planner can do about low demand in suburban residential areas, so the best way to avoid unfavorable transit services to such areas would be to stop developing suburban low-density residential areas.

**2. What differences and similarities exist between the findings of a and b?**

Planners can explain the decisions that deviate from the recommended knowledge-based solutions in transit planning. In both case cities, such deviations were due to land-use development in car-based areas and few restrictions on the private car. Conflicting objectives and counteractive measures are not problematized to a great extent in the planning documents. The planners make an effort but struggle to communicate the consequences of counteractive measures to the politicians and decision-makers.

**3. How do the findings differ between the two case cities?**

The local planners in Trondheim actively used knowledge to increase funding for parts of the project by explaining to politicians the consequences of their actions. They deliberately attempted to simplify information so that politicians could understand the matters discussed in the planning documents. In Hamar, the consultant assumed the role as a mediator, using knowledge to help local stakeholders agree upon what strategies would be the best when the aim was to increase transit competitiveness. In both cities, planners had to compromise and accept that unfavorable solutions occurred because of political reluctance to limit the accessibility of the private car and as a result of extensive, low-density land use.

**4. What role did knowledge, collaboration, and conflicting politics play when suboptimal or unfavorable solutions were chosen?**

Knowledge regarding transit competitiveness was not a priority when transit-unfavorable solutions were chosen. Thus, such knowledge played a minor role when transit-unfavorable decisions were made. In these cases, power and competing objectives had a larger role than the knowledge base that was geared toward helping to increase transit competitiveness. It can also be concluded that though planners are well informed, bad decisions are made when politicians either choose to prioritize other objectives due to conflicting politics or unknowingly due to premature consensus. If the political decisions are suffering from premature consensus, the politicians are unknowingly sabotaging their own investments, and the possibility for increasing transit competitiveness is reduced, perhaps dramatically. This can be due to a sectorized planning system that makes conflicting objectives and counteractive measures less detectable for the decisionmakers.

In this work, the planners did not report collaboration difficulties as a reason for unfavorable decisions in transit planning, although some collaboration challenges were mentioned in relation to the case of Trondheim. Here, the project planners reported that the challenges were resolved by establishing a "project culture," which allowed them to find common ground and to stand stronger when there were disagreements with official organizations. In Hamar, the consultant reported functioning as a mediator, using "professional knowledge" as a tool to help

the local planners create consensus among local official organizations and authorities.

In the cases in which the planners ended up having to make decisions limiting transit competitiveness, they did so knowing that these solutions were not in accordance with the adopted objectives of reducing the use of the private car and increasing transit competitiveness. Transit-unfavorable solutions were chosen when politicians prioritized the accessibility of the private car, and transit was expected to adapt to land-use development in suburban and car-based areas. The planners recognized these issues and made efforts to counteract them. However, the politicians and decision-makers did not respond to a great extent to these efforts. The lack of response can be either because they do not want to prioritize transit competitiveness over other concerns, or because they do not understand the complex mechanisms at play between land use, transport planning and transit competitiveness.

*7.1. A suggestion to reduce uncertainty in planning*

To reduce uncertainty in planning, planners should not only aim to identify problems and inform politicians and decision-makers about them, because knowledge is often disregarded by those in power if they prioritize counteractive objectives. It cannot be stated that all individuals in power knowingly do this nor that all individuals in power are suffering from premature consensus. Still, it is evident that planners can provide more support to decision-makers. The problem is that those in power either do not want this support or do not know that they need it. Therefore, it becomes the planner's responsibility to not only detect and inform but to also awaken a need among those with power for the illumination of causal relationships between the urban structure, transport, and transit competitiveness when there is an aim to increase transit and reduce the use of the private car.

**Funding**

This study was supported by the Norwegian Research Council, Norway under grant number 268086.

**CRediT authorship contribution statement**

Eva-Gurine Skartland: Conceptualization, Literature study, Theoretic framework, Methodology, Data analysis, Tables, Maps, Visualization, Investigation, Writing as single author, Revision. Data collection: Eva-Gurine organized and conducted all interviews, Aud Tennøy (Institute of Transport Economics) was present in 50% of the interviews, Marianne Knapskog (Institute of Transport Economics) was present in one interview. Supervision: Petter Næss (Norwegian University of Life Sciences), Aud Tennøy (Institute of Transport Economics).

**Acknowledgements**

I would like to thank the local planners and stakeholders who contributed with their time and knowledge to this work. I would also like to thank the reviewers, my supervisor, peers and colleagues for their comments.

*Declaration of interest*

I declare no conflict of interest.

**Appendix A**

See Appendix [Table A 1](#).

**Table A 1**  
illustrates the planning documents that was studied for the purpose of this paper.

	Metrobus Trøndelag county (Previous Sør-Trøndelag)	Change in route structure Innlandet county (Previous Hedmark)
Planning documents for the route structure change projects	<p><b>Sub-strategy Road 2019–2030, was approved by the county council in October (case 140/18).</b> (Trøndelag County, 2018b)</p> <p><b>Sub-strategy Mobility 2019–2030 Not yet approved by the county council (Trøndelag County, 2018a)</b></p> <p><b>Future route structure with Metrobus in Greater Trondheim 2019–2029</b> Summary report with recommendations (AtB, 2016)</p> <p><b>Route selection for Metrobus Case presentation - archive case 16/7302, 73454/16</b> Case presentation Archive item: 16/7302 Trondheim municipality (Trondheim Municipality, 2016)</p> <p><b>Action Program 2020–2023 The Environmental Package for Transport in Trondheim</b> Considered by the county committee on 18 June 2019 (case 186/19) and in the City Council 13.06.19 (case 90/19) (Miljøpakken, 2019)</p>	<p><b>Land use and transport strategy for Mjøsbymen (2019)</b> Approved by Innlandet county council April 2020 case 2020/33802 (Innlandet County, 2019)</p> <p><b>Regional Transport Plan Hedmark County Municipality 2012–2021</b> (2012) The County Council's decision 11–13 June 2012, case 40/12 (Hedmark County, 2012)</p> <p><b>County sub-plan for coordinated environmental, area and transport development (SMAT)</b> in 6 cities and towns and 2 business areas in the Hamar region 2009–2030 (2009) (Hedmark County, 2009)</p> <p><b>Action plan for Hedmark Trafikk FK 2018–2021</b> Adopted by the county council on 13.06.2017, case 45/17 (Hedmark County, 2017)</p> <p><b>Power point presentation illustrating all analysis and results delivered by consultant firm to Hedmark trafikk</b> (Hedmark Trafikk, 2018)</p>

A 1 The document study

## Appendix B. Questions

### Interview guide

Example: Trondheim, and the Metrobus and route structure project. The same guide is used for all interviews, except follow up conversations after the formal interviews. The interviews had a conversational form, and lasted between one, to one and a half hour.

### Public transport planning

*In this interview, we are concerned with a concrete measure in an urban area to strengthen the competitiveness of public transport versus the car. Competitiveness = share of travelers by public transport versus share of travelers by private car. We will focus on public transport in the city region (for instance Trondheim). A relevant starting point for the interview is the Metrobus and the route structure project in Trondheim.*

### Objectives and measures for goal achievement

- 1) What kind of objectives and strategies (formulations, real ambitions, background) are the starting point for the plan/incorporated in the plan for the measure (transit project) itself, which deals with strengthening the competitiveness of public transport versus the car?
- 2) Can you name any conflicting objectives?
- 3) How can the Metrobus and the route structure project contribute to strengthening the competitiveness of public transport versus the car? In what ways?
- 4) Which sub-factors in this measure are most important for strengthening the competitiveness of public transport versus the car? Why?

- 5) Is there anything in the plan for the Metrobus and the route structure project / current overall plans in total that weakens transit's competitiveness versus the car?

### Planning practice

- 6) What are the main issues in the work of developing such a change in the public transport system and how are these handled (overall plan level is also relevant here)?
- 7) What practical / planning analyzes, considerations and the like are behind the current plan for the Metrobus and the route structure project?
- 8) What kind of knowledge, methods, analyzes, tools, data has been/are used in the planning process?

### Collaboration with other actors and distribution of tasks in the planning process

- 9) How did the actors involved work together on the development of the Metrobus and the route structure project?
- 10) Is there anything that can be improved in the process / use of knowledge / analyzes / tools / collaboration? In what way? How would these improvements contribute to increased transit competitiveness?
- 11) Is there anything we forgot to ask about or should have thought of? Is there anything you want to tell us more about?

## References

- Alves, J. (2017). *The Effect of Transit-Oriented Development in Arlington, Virginia on Transport Choices*. jaredalves.com. Retrieved 06.16.2021 from (<https://jaredalves.com/2017/01/08/the-effect-of-transit-oriented-development-in-arlington-virginia-on-transport-choices/>).
- Antonson, H., Hrelja, R., & Henriksson, P. (2017). People and parking requirements: Residential attitudes and day-to-day consequences of a land use policy shift towards sustainable mobility. *Land Use Policy*, 62, 213–222.
- AtB. (2016). *Future route structure with Metrobus in Greater Trondheim 2019–2029* [Summary report]. ([https://www.atb.no/getfile.php/132275-1509446099/Rapport er/AtB Framtidig rutestruktur 2019–2029 Sammen dragsrapport 13.05.16.pdf](https://www.atb.no/getfile.php/132275-1509446099/Rapport%20er/AtB%20Framtidig%20rutestruktur%202019-2029%20Sammendragsrapport%2013.05.16.pdf)).
- Badland, H. M., Garrett, N., & Schofield, G. M. (2010). How does car parking availability and public transport accessibility influence work-related travel behaviors? *Sustainability*, 2(2), 576–590.
- Barr, D. A. (1972). The professional urban planner. *Journal of the American Planning Association*, 38(3), 155–159.
- Bertolini, L. (2010). Coping with the irreducible uncertainties of planning: An evolutionary approach. In P. Healey, & J. Hillier (Eds.), *The Ashgate Research Companion to Planning Theory: Conceptual Challenges for Spatial Planning* (first ed., pp. 413–424). Routledge. <https://doi.org/10.4324/9781315279251>.
- Burns, M. (2005). *Public Transport & Urban Design Hi Trans Best Practice Guide*. HiTrans.
- Campbell, S. (1996). Green cities, growing cities, just cities?: Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association*, 62(3), 296–312.
- Cao, X. J., Næss, P., & Wolday, F. (2019). Examining the effects of the built environment on auto ownership in two Norwegian urban regions. *Transportation Research Part D: Transport and Environment*, 67, 464–474. <https://doi.org/10.1016/j.trd.2018.12.020>
- Christensen, K. S. (1985). Coping with Uncertainty in Planning, 1985/03/31 *Journal of the American Planning Association*, 51(1), 63–73. <https://doi.org/10.1080/01944368508976801>.
- Christiansen, P., Fearnley, N., Hanssen, J. U., & Skollerud, K. (2017). Household parking facilities: relationship to travel behaviour and car ownership. *Transportation Research Procedia*, 25, 4185–4195. <https://doi.org/10.1016/j.trpro.2017.05.366>
- Christiansen, P., Engebretsen, Ø., Fearnley, N., & Hanssen, J. U. (2017). Parking facilities and the built environment: Impacts on travel behaviour. *Transportation Research Part A: Policy and Practice*, 95, 198–206. <https://doi.org/10.1016/j.tra.2016.10.025>
- Curtis, C., & Low, N. (2016). *Institutional Barriers to Sustainable Transport*. Routledge.
- De Gruyter, C., Truong, L. T., & Taylor, E. J. (2020). Can high quality public transport support reduced car parking requirements for new residential apartments? *Journal of Transport Geography*, 82, Article 102627.
- Devereux, L. (2005). *Public Transport & Land use Planning HiTrans Best Practice Guide*. HiTrans.
- Engebretsen, Ø., Næss, P., & Strand, A. (2018). Residential location, workplace location and car driving in four Norwegian cities. *European Planning Studies*, 26(10), 2036–2057. <https://doi.org/10.1080/09654313.2018.1505830>
- Fenton, P. (2016). Sustainable mobility as Swiss cheese? –Exploring influences on urban transport strategy in Basel. *Natural Resources Forum*, 40(4), 143–155. <https://doi.org/10.1111/1477-8947.12093>
- Flyvbjerg, B. (1996). The dark side of planning: rationality and 'realrationalitaet'.

- Flyvbjerg, B. (2002). Bringing power to planning research: One researcher's praxis story. *Journal of Planning Education and Research*, 21(4), 353–366. <https://doi.org/10.1177/0739456x0201200401>
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219–245. <https://doi.org/10.1177/1077800405284363>
- Forester, J. (1999). *The Deliberative Practitioner: Encouraging Participatory Planning Processes*. MIT Press.
- Friedmann, J. (1998). Planning theory revisited. *European Planning Studies*, 6(3), 245–253.
- Friedmann, J. (2003). Why do planning theory? *Planning Theory*, 2(1), 7–10.
- Goodwin, P., Hass-Klau, C., & Cairns, S. (1998). Evidence on the effects of road capacity reduction on traffic levels. *Traffic Engineering Control*, 39(6), 348–354.
- Hanssen, J. U., & Christiansen, P. (2013). Parkeringspolitikken i fem norske byer-mål, normer og erfaringer. *TØI Rapport*, 1266, 2013.
- Hedmark County. (2009). *County sub-plan for coordinated environmental, area and transport development (SMAT) in 6 cities and towns and 2 business areas in the Hamar region 2009–2030*. (<https://www.mjosbyen.no/wp-content/uploads/2018/02/fylkesdelplan-for-samordnet-miljo-areal-og-transportutviklingen-smat.pdf>).
- Hedmark County. (2012). *Regional Transport Plan Hedmark County Municipality 2012–2021 (2012)* (<https://innlandetfylke.no/f/p1/i5e2b6873-57e0-4e42-93cb-480961287f85/regional-samferdselsplan-2012-2021.pdf>).
- Hedmark County. (2017). *Action plan for Hedmark Trafikk FKF 2018–2021* (<https://innlandstrafikk.no/f/p4/i1f79a86-fb12-4592-83a1-b3dd7e9c9c7e/tiltaksplan-for-hedmark-trafikk-fkf-2018-2021-for-trykking.pdf>).
- Hedmark Trafikk. (2018). *Shared powerpoint presentation on local public transport planning (Unpublished)*. Hedmark Trafikk.
- Hillnhütter, H. (2016). *Pedestrian Access to Public Transport* (Publication Number PhD thesis no. 314) University of Stavanger. Stavanger. (<https://uis.brage.unit.no/uis-xmlui/bitstream/handle/11250/2422928/Helge.Hillnhutter.pdf>).
- Howes, A. R., & Tom. (2005). *Public Transport- Citizens' Requirements Hi Trans Best Practice Guide*. HiTrans.
- Hrelja, R. (2011). The tyranny of small decisions. Unsustainable cities and local day-to-day transport planning. *Planning Theory & Practice*, 12(4), 511–524. <https://doi.org/10.1080/14649357.2011.626312>
- Hrelja, R. (2015). Integrating transport and land-use planning? How steering cultures in local authorities affect implementation of integrated public transport and land-use planning. *Transportation Research Part A: Policy and Practice*, 74, 1–13. <https://doi.org/10.1016/j.tra.2015.01.003>
- Hrelja, R., Pettersson, F., & Westerdahl, S. (2016). The qualities needed for a successful collaboration: A contribution to the conceptual understanding of collaboration for efficient public transport. *Sustainability*, 8(6), 542. (<https://www.mdpi.com/2071-1050/8/6/542>).
- Hrelja, R., Khan, J., & Pettersson, F. (2020). How to create efficient public transport systems? A systematic review of critical problems and approaches for addressing the problems. *Transport Policy*, 98, 186–196. <https://doi.org/10.1016/j.tranpol.2019.10.012>
- Hrelja, R., Hansson, L., Richardson, T., Svensson, T., Lissandrello, E., Næss, P., ... Longva, F. (2013). *Innovations for Sustainable Public Transport: Experiences and Challenges in the Scandinavian Countries*. Statens väg-och transportforskningsinstitut.
- Ingvarsson, J. B., & Nielsen, O. A. (2018). How urban density, network topology and socio-economy influence public transport ridership: Empirical evidence from 48 European metropolitan areas. *Journal of Transport Geography*, 72, 50–63.
- Innlandet County. (2019). *Land use and transport strategy for Mjøsyen (2019)*. (<https://www.mjosbyen.no/wp-content/uploads/2019/01/horingsutgave-areal-og-transport-strategi-for-mjosbyen-januar-2019.pdf>).
- Jespersen, P.H. (2000). Transport. In H.-A. m. f. (red.) (Ed.), *Dansk Naturpolitik - Viden og vurderinger*. (Vol. Temarapport 1, pp. 100–113). Naturrådet. ([https://vbn.aau.dk/ws/files/197647018/Natur\\_det\\_temarapport\\_1\\_2000\\_viden\\_og\\_vurderinger.pdf](https://vbn.aau.dk/ws/files/197647018/Natur_det_temarapport_1_2000_viden_og_vurderinger.pdf)).
- Johansson, E., Winslott Hisehus, L., Koglin, T., & Wretstrand, A. (2017). Evaluation of public transport: Regional policies and planning practices in Sweden. *Urban, Planning and Transport Research*, 5(1), 59–77.
- Kager, R., & Harms, L. (2017). *Synergies from Improved Cycling-Transit Integration: Towards an integrated urban mobility system*. (<https://www.itf-oecd.org/sites/default/files/docs/improved-cycling-transit-integration-synergies.pdf>).
- Kager, R., Bertolini, L., & Te Brömmelstroet, M. (2016). Characterisation of and reflections on the synergy of bicycles and public transport. *Transportation Research Part A: Policy and Practice*, 85, 208–219. <https://doi.org/10.1016/j.tra.2016.01.015>
- Kamruzzaman, M., Shatu, F. M., Hine, J., & Turrell, G. (2015). Commuting mode choice in transit oriented development: Disentangling the effects of competitive neighbourhoods, travel attitudes, and self-selection. *Transport Policy*, 42, 187–196. <https://doi.org/10.1016/j.tranpol.2015.06.003>
- Khan, J., Hrelja, R., & Pettersson-Löfstedt, F. (2021). Increasing public transport patronage—An analysis of planning principles and public transport governance in Swedish regions with the highest growth in ridership. *Case Studies on Transport Policy*, 9(1), 260–270.
- Legacy, C., Curtis, C., & Sturup, S. (2012). Is there a good governance model for the delivery of contemporary transport policy and practice? An examination of Melbourne and Perth. *Transport Policy*, 19(1), 8–16. <https://doi.org/10.1016/j.tranpol.2011.07.004>
- Low, N., & Astle, R. (2009). Path dependence in urban transport: an institutional analysis of urban passenger transport in Melbourne, Australia, 1956–2006. *Transport Policy*, 16(2), 47–58. <https://doi.org/10.1016/j.tranpol.2009.02.010>
- Lunke, E.B., Engebretsen, Ø. (2021). *Tett eller tilgjengelig?* TØI-Report 1827/2021 (<https://www.toi.no/getfile.php?mmfileid=55390>).
- Macmillen, J., & Stead, D. (2014). Learning heuristic or political rhetoric? Sustainable mobility and the functions of 'best practice'. *Transport Policy*, 35, 79–87. <https://doi.org/10.1016/j.tranpol.2014.05.017>
- Marsden, G. (2006). The evidence base for parking policies—A review. *Transport Policy*, 13(6), 447–457.
- Mashhadi Moghadam, S. N., & Rafieian, M. (2019). If Foucault were an urban planner: An epistemology of power in planning theories. *Cogent Arts & Humanities*, 6(1), Article 1592065.
- McLeod, S., Scheurer, J., & Curtis, C. (2017). Urban public transport: planning principles and emerging practice. *Journal of Planning Literature*, 32(3), 223–239. <https://doi.org/10.1177/0885412217693570>
- Mees, P. (2000). *A Very Public Solution: Transport in the Dispersed City*. Melbourne University Press.
- Mees, P. (2009). *Transport for Suburbia: Beyond the Automobile Age*. Earthscan.
- Miljøpakken. (2019). *Action Program 2020–2023 The Environmental Package for Transport in Trondheim*. (<https://miljopakken.no/wp-content/uploads/2019/12/Handlingsprogram-2020-2023.pdf>).
- Ministry of Transport. (2020). *Further developed zero growth objective definition* (<https://www.regjeringen.no/no/aktuelt/videreutviklet-nullvekstmal-fastsatt/id2705422/>).
- Mjøsyen. (2021). *The need for a new reward scheme for medium sized urban areas - input to the work on the National Transport Plan 2022–33 from Mjøsyen to The Ministry of Transport, (2021)*. (<https://www.mjosbyen.no/wp-content/uploads/2021/01/fellesinnspill-ntp-belonningsordning-mjosbyen.pdf>).
- Mogridge, M. J. (1997). The self-defeating nature of urban road capacity policy: A review of theories, disputes and available evidence. *Transport Policy*, 4(1), 5–23.
- Næss, P. (2001). Urban planning and sustainable development. *European planning studies*, 9(4), 503–524. <https://doi.org/10.1080/713666490>
- Næss, P. (2016). Built environment, causality and urban planning. *Planning Theory & Practice*, 17(1), 52–71. <https://doi.org/10.1080/14649357.2015.1127994>
- Næss, P., Cao, X., & Strand, A. (2017). Which D's are the important ones? The effects of built environment characteristics on driving distance in Oslo and Stavanger. *Journal of Transport and Land Use*, 10(1), 945–964. (<https://www.jstor.org/stable/26264535>).
- Næss, P., Tonnesen, A., & Wolday, F. (2019). How and why does intra-metropolitan workplace location affect car commuting? *Sustainability*, 11(4), 1196. <https://doi.org/10.3390/su11041196>
- Næss, P., Hansson, L., Richardson, T., & Tennøy, A. (2013). Knowledge-based land use and transport planning? Consistency and gap between "state-of-the-art" knowledge and knowledge claims in planning documents in three Scandinavian city regions. *Planning Theory & Practice*, 14(4), 470–491.
- Næss, P., Andersen, J., Nicolaisen, M. S., & Strand, A. (2014). Transport modelling in the context of the 'predict and provide' paradigm. *European Journal of Transport and Infrastructure Research*, 14(2), 102–121.
- Næss, P., Andersen, J., Nicolaisen, M. S., & Strand, A. (2015). Forecasting inaccuracies: A result of unexpected events, optimism bias, technical problems, or strategic misrepresentation? *Journal of Transport and Land Use*, 8(3), 39–55. (<http://www.jstor.org/stable/26189165>).
- Næss, P., Strand, A., Wolday, F., & Stefansdottir, H. (2019). Residential location, commuting and non-work travel in two urban areas of different size and with different center structures. *Progress in Planning*, 128, 1–36. <https://doi.org/10.1016/j.progress.2017.10.002>
- Nielsen, G., Nelson, J. D., & Mulley, C. (2005). *Public Transport: Planning the Networks*. HiTrans.
- Nielsen, G., Lange, T. (2015). 79 råd og vink for utvikling av kollektivtransport i regionene. Samferdselsdepartementet. ([https://www.regjeringen.no/contentassets/e59526c16e4841cda9bd2b618fab900e/79\\_rad\\_og\\_vink.pdf](https://www.regjeringen.no/contentassets/e59526c16e4841cda9bd2b618fab900e/79_rad_og_vink.pdf)).
- Nielsen, G., Lange, T., As, C.C., Mulley, O.C., Nelson, J.D. (2006). Network planning and design for public transport success—and some pitfalls. European Transport Conference, Strasbourg, September.
- Nielsen, G., Lange, T. (2008). Network design for public transport success—Theory and examples. Norwegian Ministry of Transport and Communications, Oslo. (<http://civitas.no/assets/nielsenlangethredbo10paper.pdf>).
- norgeskart.no. (<https://www.norgeskart.no/#!?project=norgeskart&layers=1002&zoom=4&lat=6834991.96&lon=527157.31&drawing=Fua0JHYBSvBDp6jFnoF9t>).
- Norwegian Road Administration. (2019). *National Travel Survey 2018*. ([https://www.vegvesen.no/attachment/2674990/binary/1361215?fast\\_title=N%C3%B8kkelrapport+Reisevaneunders%C3%B8kkelsen+2018++november+2019.PDF](https://www.vegvesen.no/attachment/2674990/binary/1361215?fast_title=N%C3%B8kkelrapport+Reisevaneunders%C3%B8kkelsen+2018++november+2019.PDF)).
- Øksenholt, K. V., & Tennøy, A. (2018). Exploring how politicians reflect on counteracting measures: the case of the Trondheim package. *Applied Mobilities*, 5(2), 122–137. <https://doi.org/10.1080/23800127.2018.1427822>
- Paulsson, A., Hylander, J., & Hrelja, R. (2017). One for all, or all for oneself? Governance cultures in regional public transport planning. *European Planning Studies*, 25(12), 2293–2308.
- Petersen, T. (2016). Watching the Swiss: A network approach to rural and exurban public transport. *Transport Policy*, 52, 175–185.
- Pettersson, F., & Hrelja, R. (2018). How to create functioning collaboration in theory and in practice – practical experiences of collaboration when planning public transport systems, 2020/01/02 *International Journal of Sustainable Transportation*, 14(1), 1–13. <https://doi.org/10.1080/15568318.2018.1517842>.
- Pløger, J. (2004). Strife: Urban planning and agonism. *Planning Theory*, 3(1), 71–92.
- Pont, M.B., Perg, P., Haupt, P., Heyman, A. (2020). A systematic review of the scientifically demonstrated effects of densification. IOP Conference Series: Earth and Environmental Science.
- Pund, G. (2001). City density and public transport: a review of three recent publications. *Australian Planner*, 38(2), 74–79.

- Redman, L., Friman, M., Gärling, T., & Hartig, T. (2013). Quality attributes of public transport that attract car users: A research review. *Transport Policy*, 25, 119–127. <https://doi.org/10.1016/j.tranpol.2012.11.005>
- Ruter. (2011). *Prinsipper for linjenettet Ruterrapport 2011:17*. Oslo: Ruter. <https://docplayer.me/68308240-Prinsipper-for-linjenettet.html>.
- Ruter. (2015). M2016 Fra dagens kollektivtrafikk til morgendagens mobilitetsløsninger. Ruter. ([https://m2016.ruter.no/content/uploads/2015/08/RUTE0057\\_M2016\\_10\\_08.15\\_Low.pdf](https://m2016.ruter.no/content/uploads/2015/08/RUTE0057_M2016_10_08.15_Low.pdf)).
- Ruter. (2017). Prinsipper for linjenettet, veileder i bruk av planleggingen av trafikktilbudet. Ruter. (<https://docplayer.me/68308240-Prinsipper-for-linjenettet.html>).
- Sager, T., & Ravlum, I.-A. (2005). The political relevance of planners' analysis: The case of a parliamentary standing committee. *Planning Theory*, 4(1), 33–65.
- Sanyal, B. (2018). A planners' planner: John Friedmann's quest for a general theory of planning. *Journal of the American Planning Association*, 84(2), 179–191.
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. Routledge.
- Skartland, E.-G. (2021). How interventions in master plans affect public transport competitiveness versus cars: a case study of two small and two medium-sized city regions. *Urban Planning and Transport Research*, 1–31. <https://doi.org/10.1080/21650020.2020.1862701>
- Skartland, E.-G. (Forthcoming). Transit versus private car: Is there a way forward for small cities?
- SSB. (2020). Statistics Norway. (<https://www.ssb.no/statbank/table/04859/>).
- Tennøy, A., & Øksenholt, K. V. (2018). The impact of changed structural conditions on regional sustainable mobility planning in Norway. *Planning Theory & Practice*, 19(1), 93–113. <https://doi.org/10.1080/14649357.2017.1408135>
- Tennøy, A., Tønnesen, A., & Gundersen, F. (2019). Effects of urban road capacity expansion—Experiences from two Norwegian cases. *Transportation Research Part D: Transport and Environment*, 69, 90–106. <https://doi.org/10.1016/j.trd.2019.01.024>
- Tennøy, A., Hansson, L., Lissandrello, E., & Næss, P. (2016). How planners' use and non-use of expert knowledge affect the goal achievement potential of plans: Experiences from strategic land-use and transport planning processes in three Scandinavian cities. *Progress in Planning*, 109, 1–32. <https://doi.org/10.1016/j.progress.2015.05.002>
- Tennøy, Aud (2012). *How and why planners make plans which, if implemented, cause growth in traffic volumes*. Ås: Norwegian University of Life Sciences.
- Thomas, R., & Bertolini, L. (2014). Beyond the case study dilemma in urban planning: using a meta-matrix to distil critical success factors in transit-oriented development. *Urban Policy and Research*, 32(2), 219–237. <https://doi.org/10.1080/08111146.2014.882256>
- Thomas, R., Pojani, D., Lenferink, S., Bertolini, L., Stead, D., & van der Krabben, E. (2018). Is transit-oriented development (TOD) an internationally transferable policy concept? *Regional Studies*, 52(9), 1201–1213. <https://doi.org/10.1080/00343404.2018.1428740>
- Tønnesen, A., Krogstad, J. R., Christiansen, P., & Isaksson, K. (2019). National goals and tools to fulfil them: A study of opportunities and pitfalls in Norwegian metagovernance of urban mobility. *Transport Policy*, 81, 35–44. <https://doi.org/10.1016/j.tranpol.2019.05.018>
- Trøndelag County. (2018a). Sub-strategy Mobility 2019–2030 (<https://www.trondelagfylke.no/contentassets/fc9d036bdb1345cda1086cf6a1e10b16/delstrategi-mobilitet.pdf>).
- Trøndelag County. (2018b). Sub-strategy Road 2019–2030. (<https://www.trondelagfylke.no/globalassets/dokumenter/veg/delstrategi-veg-til-web-komprimert.pdf>).
- Trondheim Municipality. (2013). Municipal land use plan for Trondheim municipality 2012–2024. ([https://www.trondheim.kommune.no/globalassets/10-bilder-og-filer/10-byutvikling/byplankontoret/kommuneplan/kpa-trondheim-2012-2024/3\\_pl\\_anbeskrivelse\\_kpa2012-24\\_web.pdf](https://www.trondheim.kommune.no/globalassets/10-bilder-og-filer/10-byutvikling/byplankontoret/kommuneplan/kpa-trondheim-2012-2024/3_pl_anbeskrivelse_kpa2012-24_web.pdf)).
- Trondheim Municipality. (2016). Route selection for Metrobus Case presentation - archive case 16/7302, 73454/16 Case presentation Archive item: 16/7302.
- Urbanet Analyse. (2018). Reisevaner i Mjøsbyen og potensialet for en miljøvennlig transportutvikling (104/2018). Urbanet Analyse. ([https://www.mjosbyen.no/wp-content/uploads/2018/03/ua-rapport-104\\_2018\\_reisevaner-i-mjosbyen.pdf](https://www.mjosbyen.no/wp-content/uploads/2018/03/ua-rapport-104_2018_reisevaner-i-mjosbyen.pdf)).
- Vedung, E. (2009). *Utværdering i politik og forvaltning*. Studentlitteratur.
- Walker, J. (2008). Purpose-driven public transport: creating a clear conversation about public transport goals. *Journal of Transport Geography*, 16(6), 436–442. <https://doi.org/10.1016/j.jtrangeo.2008.06.005>
- Walker, J. (2012). *Human Transit: How Clearer Thinking about Public Transit can Enrich our Communities and our Lives*. Island Press.
- Walter, A. I., & Scholz, R. W. (2007). Critical success conditions of collaborative methods: a comparative evaluation of transport planning projects. *Transportation*, 34(2), 195–212.
- WCED. (1987). Report of the World Commission on Environment and Development: Our common future, Chapter 2: Towards Sustainable Development (Accessed Feb, Issue. (<http://www.ask-force.org/web/Sustainability/Brundtland-Our-Common-Future-1987-2008.pdf>).
- Weinberger, R. (2012). Death by a thousand curb-cuts: Evidence on the effect of minimum parking requirements on the choice to drive. *Transport policy*, 20, 93–102.
- Wolday, F., Næss, P., & Tønnesen, A. (2019). Workplace location, polycentricism, and car commuting. *Journal of Transport and Land Use*, 12(1), 785–810. (<https://www.jstor.org/stable/26911289>).

**Eva-Gurine Skartland** is a researcher at the Department of Mobility at the Institute of Transport Economics. She is also a Ph.D. candidate at the Department of Urban and Regional Planning at the Norwegian University of Life Sciences. Skartland graduated as a Master of Science in Physical Planning from the Norwegian University of Science and Technology in 2014 and have since then gained practical experience as a municipal city planner, and as a full-time researcher. Skartland is interested in the causal relationships between land use and transport behavior, and how such relationships can contribute to and limit sustainable urban development.