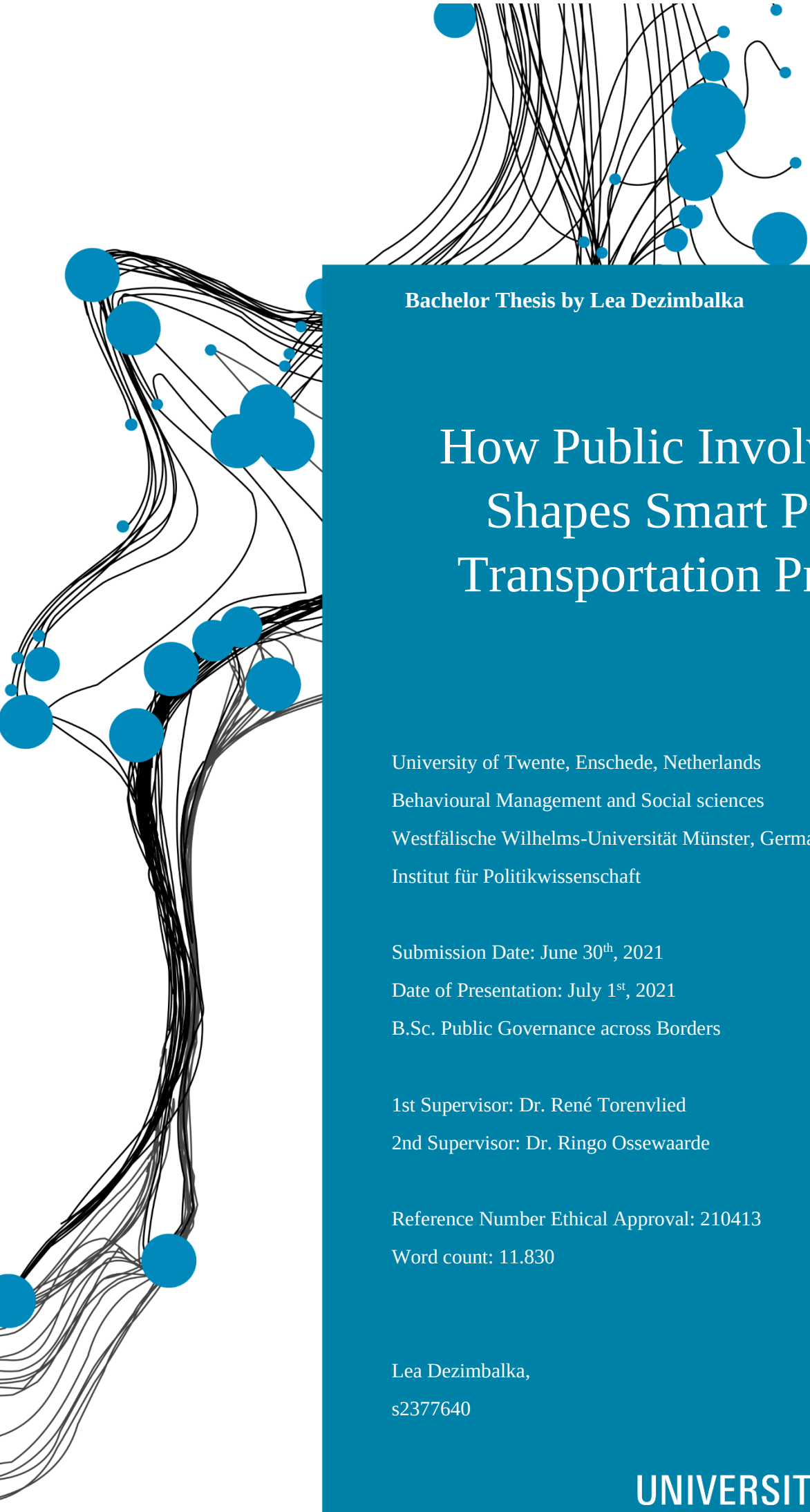

Bachelor Thesis by Lea Dezimbalka

How Public Involvement Shapes Smart Public Transportation Projects

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Abstract

The smart city concept goes beyond its technological aspect by being an extremely citizen-centred concept. An important sub-field of smart city is smart mobility and, although, the goals of smart technology in public transportation planning are straight forward, smart mobility concepts around the globe differ. Therefore, the present bachelor thesis studies the relation between public involvement in urban planning and the differences of smart public transportation projects in between cities. As theoretical grounds for this research, the idea of public involvement is conceptualized. Additionally, three similar models of the typology of public involvement are introduced. As these models miss the inclusion of e-participation, the thesis further studies the applicability of such conventional models with regard to public involvement in smart cities. To empirically study the research goals, a comparative case study of three smart cities has been conducted. While some differences of the characteristics of smart public transportation projects relate to the distinctiveness of public involvement, other differences in smart public transportation projects cannot be explained by differences in public involvement. Further, the research found that conventional models of public involvement, although missing e-participation involvement mechanisms, are still applicable in the arena of smart city.

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List of Abbreviations

AI	Artificial Intelligence
BMI	German Ministry of State/ Bundesministerium des Innern, für Bau und Heimat
EXP	Expectation
IAP2	International Association for Public Participation
ICT	Information and Communication Technology
IoT	Internet of Things

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1. Introduction

Recently, many scholars have introduced the idea on the development of smart cities as a response to the problems that will arise over the next three decades due to exponential population growth (Cassandras, 2017; Hernafi et al., 2016; Ahvenniemi et al., 2017; Cledou et al., 2018; Caragliu et al, 2011; Ji et al., 2021). In the literature (Ji et al., 2021, Ahvenniemi et al., 2017), smart technologies are proposed as a possible solution to address the problems that accompany a growing world population and the increasing demands on infrastructure.

The word 'smart' in the smart city concept refers to smart technologies. This concept is based on Information and Communication Technologies (ICTs) and the Internet of Things (IoT) which "promotes knowledge-based development through the continuous learning of human resources as an integrative part of urban resource development […]" (Sutriadi 2018, p.7). These technological aspects are closely connected to the development of Artificial Intelligence (AI). The term 'AI' refers to "diverse technologies, which are propelled by computational power, and which build on methods in fields such as machine learning to advance automated and increasingly autonomous decision-making and actions" (Schippers, 2020, p. 33).

The smart city can be regarded as a "place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants" (European Commission, 2020). Furthermore, the European Commission (2020) adds that smart cities are also "striving for sustainability through smarter urban transport networks, upgraded water supply and waste disposal facilities, and more efficient ways to light and heat buildings". In the following, the use of the smart city can be understood as smart sustainable city, thus implying the inherent concept of sustainability.

The increasing demands on infrastructure mentioned above are addressed through the incorporation of smart mobility in the smart city. Thereby, the term 'smart mobility' refers to the smart technology aspect and involves "the use of Information and Communication Technology in modern transport technologies to improve urban traffic" (Albino, Berardi, Dangelico, 2015, p. 11). A relevant feature of smart mobility are smart public transportation systems (Cassandras, 2017). What makes public transportation systems a valuable aspect of the concept of smart city is on the one hand, that they are a sustainable alternative to using one car for one person only. On the other hand, an increased availability of public transport systems improves the infrastructure by, for example, saving parking space, or improving the infrastructure by creating short ways.

The smart city concept is not restricted to the smart technology aspect but also rests on a citizen-centred approach in the planning process (Wilson et al., 2019). Furthermore, especially in the urban planning of public transportation projects, public involvement is considered important (Zhong et al,

2008). This people- or citizen-centred approach of urban city planning is based on the concept of public involvement. Including the public into urban planning is regarded as an important element in the process of re-structuring cities as smart cities (Ibeas et al., 2011). By including the public in urban planning processes, the quality, transparency, and legitimacy of the planning process increases. The concept of public involvement hereby is not new and rests on many different theoretical perspectives and models, some of which I will explain in chapter 2 of my thesis. These theoretical models will be used to analyse the public involvement mechanisms in different smart cities. Further, I aim at explaining differences in the urban planning process resulting in different smart public transportation projects and a differing smart mobility section. To address this, I will use conventional theoretical models that do not include e-participation aspects – connected to the aspect of ICT that is involved in the smart city concept – intentionally in order to assess whether they still can be applied or are outdated.

1.1 Relevance and Research Question

When examining smart city concepts such as Singapore (National Climate Change Secretariat, 2016), Bristol (Connecting Bristol, n.d.), or Berlin (Smart City-Strategie Berlin, 2015), it can be seen that the concepts, and more specifically the smart public transportation projects differ between cities. What is covered extensively in literature is how successful public involvement is as well as to measure the extent of involvement and what advantages it brings along (Grossardt et al, 2003; Slotterback, 2010; Cardullo, Kitchin, 2018). However, what is not yet addressed is the extent to which public involvement mechanisms can explain actual differences in urban planning and thus the differences in the smart mobility concept. Therefore, the main research question that I address in my thesis intends to answer:

RQ1: "To what extent can different approaches to public involvement during urban planning explain differences in the characteristics of smart public transportation projects in the smart mobility concept of a city?"

To understand what effects public involvement can have, it is necessary, besides elaborating the theoretical models used during the analysis, to answer the following sub-question:

SQ1: What are theoretically, the expected effects of public involvement on the planning process of cities?

Since the research goal of this thesis is to explain differences in the smart mobility concept and the smart public transportation projects between a selected number of cases, the following sub-questions thus provide the grounds for explaining these differences through the public involvement mechanisms.

SQ2: What differences do we observe between smart cities in their smart public transportation projects and smart mobility concept?

SQ3: What differences do we observe between smart cities in public involvement in the planning of smart public transportation projects and smart mobility concept?

As the involvement of citizens in the decision-making processes no longer solely takes place using conventional involvement mechanisms but also includes e-participation possibilities, my thesis will contribute to the existing research by evaluating whether the conventional models about public involvement and citizen participation can still be applied to contemporary smart cities or whether new technologies changed the involvement of the public in such a way that conventional involvement models are outdated. Therefore, I address a second minor research question in my thesis:

RQ2: To what extent can existing theoretical models of public involvement still be applied in explaining public involvement mechanisms without reflecting on e-participation?

1.2 Structure of The Thesis

To answer the present research questions, the next chapter introduces the theoretical framework of the thesis. Firstly, the concept of public involvement is discussed. Secondly, the different theoretical models that provide the basis of my research will be described. In order to approach my research aim, I will do a comparative case study of three selected smart cities. Hereby, one case´s smart city concept goes beyond the concept of the other two cases by including the suburban area around the city in the development of their smart city strategy. A content analysis of the smart mobility concept and the public involvement mechanisms found will assist in detecting the differences and similarities in between the cases. This research design is discussed in chapter 3 and further elaborates the case selection as well as the data collection. Thereafter, chapter 4 introduces the selected cases providing a description of their smart mobility concepts and a reconstruction of the public involvement mechanisms present during the planning process. The following analysis aims at explaining how differences between the cases regarding their smart mobility and smart public transportation concept are connected to the different mechanisms of public involvement. To approach the secondary research question of the present thesis, the mechanisms of public involvement become categorized and evaluated with the regard of their lack of including e-participation. The results of this comparative case study will be summarized in the last chapter, also reflecting on the research conducted and methods used.

2. Theory

In this chapter I present the most relevant theories approaching the typology of public involvement from different perspectives. This shall provide the theoretical framework, necessary for analysing the public involvement mechanisms found in the three selected cases which takes place in chapter 5. This chapter is organized by firstly discussing the general concept of public involvement. Thereafter, three different models of public involvement are introduced. Firstly, the 'Ladder of Participation' by Sherry R. Arnstein (1969) is described. Secondly, the 'Spectrum of Public Participation' conceptualized by the International Association for Public Participation (IAP2, 2018) and thirdly, the 'Typology of Participation' model by Jules N. Pretty (1994) is presented. This is followed by putting forward expectations about what my research may reveal based on this theoretical background.

2.1 Public Involvement

A core mechanism, put forward in the literature on urban planning processes, is public involvement. The term public involvement refers to "people having more say in agencies, organisations, and institutions which impact upon them and being able to exert more control over their own lives" (Beresford, 2020, p. 97). It describes a change from conventional decision-making towards a more citizen-centred approach. When speaking of 'public', one relates to a variety of actors including, according to Thomas (1990),

> "Traditional interest groups (e.g., business lobbies, labour unions, program beneficiaries), consumer and environmental groups, other public interest groups, residential groups (either organized homeowners associations or unorganized residents who are geographically targeted by a decision), and advisory committees that include representatives of any of these other group" (p. 436).

Since the aim of public involvement is to include all citizens in the decision-making process, 'public' also refers to citizens who are neither professionals nor government officials (Rohse, Ross, 1992). Thus, 'public' in the context of the present thesis refers to all citizens living within the selected case, and who did not participate in the decision-making process as employees of the prevailing public administration. Now, that the 'public' has been conceptualized, I will illustrate what 'involvement' refers to. A more general understanding of involvement is according to Callahan (2007) for administration to "focus on their responsibility to serve and empower citizens as they manage public organizations and implement public policy" (p. 1181). Further, as Baum (2015) describes it, public involvement includes a variety of activities. Before elaborating on these activities by describing different

theoretical models on the typology of public involvement in the next sections, I will explain why public involvement in urban planning is considered important.

According to Deutsch (1995) participating in making decisions, – which, in this case, happens by participating in the development of a smart mobility concept, the public is assumed to accept change directly affecting their lives more likely, than if the public was not involved. Additionally, individuals feel "consulted and valued" (Creighton, 1992, p. 4). Involving the public in decision-making is a deliberative process which shall increase the legitimacy and the quality of decisions (Boham, 1997) as the decisions made rest on the demands of the public and not only on what – in this case city officials – think the public wants or needs. In the literature, this process of deliberation is also subjected to criticisms. However, as the interest of the present thesis does not lie on putting value on how well the involvement of the public in the planning process has been, but solely to use the mechanisms of public involvement to explain certain differences, I will not elaborate on criticisms on the deliberation process in this thesis.

Recently, the conventional modes of public involvement have been expanded by putting a focus on e-participation. E-participation is not a completely different concept, rather, it is an extension of conventional mechanisms of public involvement (Al-Dalou, Abu-Shanab, 2013) and can be understood as a "transformation of participation in societal democratic and consultative processes mediated by information and communication technologies (ICTs), primarily the Internet" (Sæbø, Rose, Flak, 2008, p. 400). Wimmer (2007), for example, has also categorized e-participation into different stages which are e-informing, e-consulting, e-collaboration, and e-empowerment. But, with regard to the aspect of e-participation only referring to my secondary research question, I will only look at e-participation in general instead of concentrating on each different dimension developed by Wimmer.

2.2 Theories and Models of Public Involvement

In this part of the chapter, three different models about the involvement of the public are presented. These models will be used in chapter five to categorize the types of public involvement found in the selected cases. The models have intentionally been selected to be quite similar to each other. Nevertheless, the main distinction the models have, is into how many stages or levels they divide public involvement in. The reason for this is to reflect on how precise such a model must be to accurately portray the extent of public involvement. Furthermore, these models do not include any e-participation aspects. This has also been decided intentionally to evaluate the up-to-datedness of the models and to illuminate if such models in the modern world and especially with regard to smart cities – which focus on using new technologies as ICT – are still adequate enough to be used.

2.2.1 A Ladder of Participation

A prominent concept in the literature on public involvement is the 'Ladder of Citizen Participation' by Sherry R. Arnstein (1969). This model does not include the aspect of e-participation as mentioned above due to the reason that in the time the model developed, the possibilities of e-participation had not been introduced yet. Arnstein organizes the types of public involvement in eight categories, portrayed as an eight-step ladder. Overall, the types of involvement are divided by Arnstein into three general levels of participation, 'non-participation', 'degrees of tokenism', and 'degrees of citizen power'.

Non-participation includes 'manipulation' and 'therapy'. The former describes an "illusory form of 'participation'" (Arnstein, 2019, p. 26) which means that "people are placed on rubberstamp advisory committees or advisory boards for the express purpose of "educating" them or engineering their support" (p. 26) and makes public participation a "public relations vehicles by powerholders" (p. 26). The latter describes "therapy, masked as citizen participation" (p. 27) which means that the participation is only a "masquerade of involving citizens in planning" (p. 27) but this does not provide any real power in the decision-making. Therefore, these two sub-categories pretend participation and involvement of the public but in reality, the public does not have a real say in the decision-making. These categories are presented in a very subjective way by Arnstein using words like "dishonest" and "arrogant" (p. 27). For the scope of my research, I will view these categories more objectively as a categorization of non-active citizen participation where citizens simply are not given any power without analysing the intention behind it.

The degrees of tokenism represent some sort of counterfeit power and means the 'informing', 'consultation', and 'placation' of citizens. 'Informing' involves the transfer of news, information, or knowledge. Arnstein (2019) argues that if the informing of citizens is done the right way it is one way of "legitimate citizen participation" (p. 27) but, as information sometimes come too late to actually incorporate citizen´s feedback it is placed rather low on her ladder of participation. 'Consultation' refers to asking citizens for their ideas and opinions. This can take place by conducting "attitude surveys, neighbourhood meetings, and public hearings" (Arnstein, 2019, p. 28). Although this provides more opportunities for citizens to participate, Arnstein argues that if consultation is "not combined with other modes of participation, this rung of the ladder is still a sham since it offers no assurance that citizen concerns and ideas will be taken into account" (p.28). With 'placation' the level of participation rises with regard to placing citizens on boards together with powerholders that have authority over decision-making (Arnstein, 2019). Here, they have the opportunity to make decisions so far as they receive majorities.

The last three steps 'partnership', 'delegated power', and 'citizen control' are the degrees of citizen power which resembles actual power in the decision-making process. The 'partnership' type of

public involvement refers to an agreed cooperation in planning and the decision-making process between the citizens and the powerholders (Arnstein, 2019). This cooperation can take place via "joint policy boards, planning committees, and mechanisms for resolving impasses" (Arnstein, 2019, p. 31). This kind of participation ensures, according to Arnstein, quite some "genuine bargaining influence" (p.31). The next level of public involvement is called 'delegated power' which includes the accountability of the project to the citizens. This also involves "citizens achieving dominant decision-making authority over a particular plan or program" (Arnstein, 2019, p. 31). This could take shape in a citizen´s veto right if "differences of opinion cannot be resolved through negotiation" (p. 32). The highest level of public involvement, according to Arnstein, is 'citizen control' which means that citizens have the guarantee to "govern a program or an institution, be in full charge of policy and managerial aspects, and be able to negotiate the conditions under which "outsiders" may change them" (Arnstein, 2019, p. 32)[1].

2.2.2 Spectrum of Public Participation

The second model that has been chosen for the present thesis, was developed by the International Association for Public Participation (IAP2) in 2018 and presents public involvement on a spectrum. Although the 'Spectrum of Public Participation' describes public involvement in a less differentiated manner than the 'Ladder of Participation' by Arnstein, exactly this difference makes this model interesting since it can be analysed whether it is sufficient enough to categorize the different mechanisms of public involvement. Unlike regarding the model by Arnstein, I cannot give any reason for why there has not been any inclusion of e-participation in the model. But as it does not specifically include e-participation, this model fits with regard to the aim of the secondary research question, to test the up-to-datedness of models excluding e-participation aspects.

The spectrum has five stages and with each stage the role of the citizen in the involvement on the decision-making increases. The first stage is 'inform' and means that the people are provided with information about the upcoming decision(s). This action shall ensure that the citizens gain a good understanding of the situation and furthermore are informed about alternatives and opportunities (IAP2, 2018). The second stage is 'consult'. In this stage the public is allowed to give feedback on the situation/problem and has the opportunity to give their opinion on matters. While this opinion does not guarantee that things are changed or kept a certain way, the chance exits, that the feedback given by the citizens is used to adapt things. The third stage 'involve' stands for ensuring that "public concerns and aspirations are consistently understood and considered" (IAP2, 2018). The fourth stage 'collaborate'

[1] Although this theoretical model by Arnstein is developed as a critical concept, enabling an evaluation of the actual extent of public involvement, the scope of my thesis is not to criticize the observed public involvement. Therefore, I will only use the model to categorize different levels of public involvement.

involves that citizens besides giving feedback are also included directly in the development of alternatives. In this stage the citizen´s participation has more impact on the decisions compared to the last stage because here citizens are also asked to participate in the formulation of solutions and alterative rather than just voicing feedback. The last stage is 'empower' which goes further than 'collaborate' in so far that empowerment allows the public to make a final decision on a matter. This involves that the public not only contributes ideas and proposals but also decides on the contributions they have made (IAP2, 2018).

2.2.3 The Typology of Participation

Finally, the 'Typology of Participation' model that Pretty (1994) came up with is illuminated. It categorizes participation in seven stages. Although this theoretical model was invented to describe the different types of participation of how individuals participate in agricultural development programs, it can be applied to participation in sustainability development in general as well, as it has been used in a 1995 paper on citizen participation by Pretty, Bas, and Dalal-Clayton. Since the model by Pretty, Bas, and Dalal-Clayton (1995) is only slightly different in the first two stages[2] from the one invented by Pretty herself in 1994, I use her original model for the following research in my thesis.

The first stage 'passive participation' is called passive because the means of participation is limited to citizens "being told what is going to happen or has already happened" (Pretty, 1994, p. 41). Here, citizens are not asked for any feedback or ideas. The next stage is 'participation in information giving' in which citizens are being asked to give their opinions in questionnaires and surveys. However, there is no guarantee that these surveys or questionnaires influence the process. The third stage is 'participation by consultation'. In this stage citizen participation involves an external person listening to what the people have to say regarding the matter, but the impact of their opinion may not be very extensive. The fourth stage 'participation for material incentives' means that "people participate by providing resources […] in return for […] material incentives" (Pretty, 1994, p. 41). At this stage people are motivated to participate by being rewarded with some sort of material incentives. The next stage is 'functional participation', which means that people participate at later stages of the decision-making process by "forming groups to meet predetermined objectives related to the project" (Pretty, 1994, p. 41). The sixth stage 'interactive participation' involves the working together of the citizens and the "leaders" to elaborate action plans and eventually produce learning processes. Furthermore, the citizens involved "take control over local decisions" (Pretty, 1994, p. 41) at this stage presenting an immense level of participation of the citizens in the overall decision-making process. The seventh and last stage of the typology by Pretty is 'self-mobilization', which entails that citizens mobilize independently to

[2] The first stage has been changed from 'passive participation' to 'manipulative participation' and 'participation in information giving' to 'passive participation'.

change certain matters. This last stage therefore symbolises the greatest level of participation in this model.

2.3 Expectations

To conclude, this chapter conceptualized the concept of public involvement and introduced three theoretical models of how public involvement can be typologized. Public involvement is expected to improve the quality of decisions in urban planning. Considering the research question, and, also the findings of Chen (2019), Yang et al. (2020), and Liljamo et al. (2018) – which are that the acceptance of smart public transportation systems like parking apps, automated vehicles, or autonomous shuttle services increases when a person has a positive attitude towards technology, and according to Zhong et al. (2008) that the "lack of public support often causes the failure of a project that may be ideal from the technical or engineering perspective" (p. 124) – , the first and second expectations are:

EXP1. Smart public transportation projects are initiated only or largely by the citizens themselves instead of by the city.

EXP2. Smart public transportation projects are open for discussion in order to portray the interest of as many citizens as possible in order to get a wide acceptance and intention to use these transportation systems.

Since, one of the cases that I aim to analyse shall, besides including the demands of the city itself, also include the demands of the villages and suburbs around it, with regard to the aspect of acceptance of smart public transportation systems, the third expectation is:

EXP3. The case including its suburbs has a larger variety of smart public transportation projects than the other cases, as there are more citizens involved having a larger variety of demands on smart mobility.

With regard to the secondary research question e-participation is an extension of conventional public involvement mechanisms. When looking at the different stages of e-participation developed by Wimmer (2007), the impression that the conventional models of public involvement cannot categorize public involvement mechanisms of e-participation may be perceived. Nevertheless, although, the conventional theoretical models that have been introduced in chapter 2.2 do not mention e-participation explicitly, the stages and levels of participation are defined rather broad. Therefore, the fourth expectation is:

EXP4. Conventional models of public involvement are still applicable despite the lack of including e-participation.

3. Method

The following chapter will give insights into what research methodology has been chosen for approaching the research question. Firstly, the research design will be illuminated, also explaining how this design helps answering the research question of my thesis. Secondly, the case selection providing the foundation for this research is described. Thereafter, the methods of data collection are presented. It will be shed light onto what data was selected and how it was collected. Lastly, the analysis of data will be elaborated.

3.1 Research Design

To answer the research question, this explanatory study will use a comparative case study design. According to Yin (2018, p. 50) the case study design can be applied in real-world contexts as an explanation of "presumed causal links" and as a description of an "intervention and the real-world context in which it occurred". In this case, conducting a qualitative comparative case study allows to accurately study the mechanisms of public involvement and provides an in-depth illumination of each case (Yin, 2018) as a basis for the comparison between the cases.

In order to approach my primary research question, the research design that I use is the causal-process tracing. According to Blatter and Haverland (2014, p. 84) the outcome that is explained by causal-process tracing is often the result of the "combination and interaction of divergent causal factors". In the context of my research, I will not investigate a 'combination of causal factors', instead I focus only on one causal factor namely the different types of public involvement in the planning process of developing smart transportation systems. The causal-process tracing is an approach which is y-centred meaning "the researcher is interested in many complex causes of a specific outcome (Y) and not so much in the effect of a specific cause (X)" (Blatter, Haverland, 2021, p.80). Since the primary aim of my research is to find out whether public involvement causes different outcomes in the development of a smart city strategy, this method allows me to evaluate the preconditions of the outcomes.

Although, Yin (2018) argues that the case study does not allow for generalizations for societies, Blatter and Haverland (2014) suggest that by applying causal-process tracing, the comparison of the role of public involvement mechanisms can provide certain results which can "serve as a recipe from which others can learn" (p. 84). Therefore, this comparative case study offers guidance in the course of action for other cities and municipalities to learn from and maybe adopt certain types of public involvement in the transition of becoming smarter.

The threats to validity that my research design faces may occur through the interviews that I conduct as the interviewees tell their stories from their perspective and from what they recall. Thus, I need to be aware of retrospective biases that may possibly arise when interpreting my findings.

Furthermore, my case selection might be biased, although I have created profound criteria for the case selection or even precisely for this reason, this might limit the randomization of my study and moreover could put a limitation to the generalization of my findings. Another threat my research design could encounter is generalization. Since I use a small-N study, the findings do not reflect on a majority of smart cities, which requires me to be carefully with the conclusions that I draw from my analysis.

3.2 Case Selection

The cases that I have selected for my thesis have been chosen on the basis of a development program by the German Ministry of State (BMI) in 2020 to receive federal funding by the government helping cities and municipalities or administrative districts to develop their digitalization. The government initiative is called "Modellprojekte Smart Cities 2020" and includes 32 cities and municipalities. These cities and municipalities were chosen on the basis of the following criteria: "exemplariness, a strategy adapted to the location, the broad involvement of the citizenry, and a coherent overall concept" (translation of: Modellhaftigkeit des Vorgehens, die an den Standort angepasste Auswahl der Schwerpunkte einer Strategie, die breite Einbindung der Stadtgesellschaft sowie eine schlüssige Gesamtkonzeption) (BMI, 2020, p. 4). To select the units of analysis of these 32 cases, I have come up with the following criteria a) the case needs to be clearly allocated as a smart city b) existence of a published policy document about the case´s smart city concept c) a specific smart mobility section d) availability to conduct one interview in each case.

Criterion a) is applicable to all of the cities and municipalities included in the "Modellprojekte Smart Cities 2020" since the BMI only funds projects (in this case cities/municipalities) if they meet the selection criteria which involve among others a meaningful smart-city-strategy (BMI, 2020). During the next phase of the data collection, I reviewed the cities/municipalities selected by the BMI according to criteria b) and c). A number of cities was rejected due to the lack of official documents about the strategy and goals, or due to insufficient information about the smart mobility vision. After having examined the data available and having sorted out the unfit cases, I contacted the cities and municipalities that were left and asked whether they would be interested in conducting an interview with me for the present research. Only two cities responded affirmatively. Subsequently, one case is the city of Darmstadt, and the other case is the city of Gütersloh. Besides these two smart cities, one case offered an extremely detailed section about how the public was involved in the development of a strategy. This is the municipality of Iserlohn together with its nearby villages and suburb. The study of the last case is more complex than the other two cases as it is not solely about one city, but about the interconnection of Iserlohn and its surrounding areas. For this reason, I decided to concentrate solely on these three cases instead of selecting further cases.

3.3 Data Collection

The data I am going to use in my analysis have been collected partly via internet research and partly by conducting interviews. The first part of my analysis is about the comparison between the smart mobility concept of the cases and the differences in smart public transport projects. The data that I need for the comparison, are either retrieved from a published policy document (Strategie der Digitalstadt Darmstadt, 2020; Mein Iserlohn 2040, 2020) or are collected from a website specifically dedicated for the development of a smart city concept (Vernetzte Mobilität Gütersloh). The data taken from the website have been collected in a document (appendix A – Case Gütersloh) including all information about the smart mobility concept. The data retrieved from these documents describe goals, procedures, and specific projects that are already tested or planned to achieve their vision of the smart city.

The relevant content for the smart mobility concept description of the case Darmstadt can be found on pages 9 to 16 in their strategy document (appendix A – Strategie der Digitalstadt Darmstadt, 2020). The relevant content regarding the smart mobility concept of Iserlohn can be found on the pages 111 through 116 in their strategy document (appendix A – Mein Iserlohn 2040, 2020). As mentioned above the data relevant for the smart mobility concept of the case Gütersloh are brought together in a five-page document (appendix A – Vernetzte Mobilität, n.d.). In order to prevent the reading flow from being interrupted, I will not insert the page numbers from which I take the content during the case description as the pages used are already described here and the documents can be found in appendix A at the end of this thesis.

The second part of my analysis aims to study the extent of public involvement during the development process of the smart city strategy/vision and to evaluate the theoretical models introduced in chapter two. The data needed for this part of the analysis derives from two interviews that I have conducted with one city official of Darmstadt and Gütersloh (transcripts are found in the separate appendix). The case of Iserlohn has described the mechanisms of public involvement in such a detailed way that the policy document provides sufficient information and is subsequently the source of data for public involvement mechanisms in Iserlohn. The data used in the thesis are derived from pages 15 and 16 (Mein Iserlohn 2040, 2020).

3.4 Data Analysis

In order to address my primary research question, I will conduct a content analysis of the data available on public involvement and the smart mobility concept. According to Rose et al. (2015), a content analysis involves “the classification of parts of a text through the application of a structured, systematic coding scheme from which conclusions can be drawn about the message content" (p. 1). As

the goal of my research is not generating new theories, but to improve or extent existing theories like Burawoy (1998) defines content analysis, this method is suitable for my research.

As there are only three documents being analysed, a coding scheme is not very efficient. To provide grounds to ensure a systematic and replicable analysis, a description of the data used for the case description follows: For the comparison of the smart public transportation projects only the projects that are smart and are connected to public transportation will be selected and included in the analysis in chapter four. The term smart hereby means public transportation options that involve ICT. Public transportation refers to all vehicles that carry people and that are not restricted to the use of one person only. This ensures that only the projects that count as smart public transportation projects will be compared to each other.

The conducted interviews provide the data that I need to compare the public involvement mechanisms of the different cases. Additionally, to the two interviews, for the case of Iserlohn, the data about public involvement mechanisms are retrieved from the policy document of the strategy. To analyse this data, the public involvement mechanisms found during the data analysis are described and can be reread in appendix B. Overall, can the different mechanisms of public involvement be clearly traced down in the document by searching for the keyword of the according mechanism. Therefore, a coding scheme is not necessary for the replicability of my study. Thereafter, the mechanisms have been categorized into the three theoretical models presented in chapter two which is presented tables 4 to 6 in chapter 5.2. The secondary research question is approached by using the data derived from the analysis of public involvement.

4. The Cases: Darmstadt, Gütersloh, Iserlohn

This chapter introduces the cases that provide the units of analysis of my thesis. In order to analyse these cases accordingly to my research goal, the relevant characteristics of the selected cases are presented in detail. Therefore, firstly, the core goals of the smart mobility concepts and the projects of smart public transportation are described. Secondly, the process of public involvement is traced down, and the different mechanisms are illustrated. Hereby, both is elaborated on separately for each case.

4.1 Darmstadt

4.1.1 Smart Public Transportation Projects

The smart mobility concept, and herewith the smart public transportation projects, are presented in a policy document describing the overall smart city strategy of Darmstadt. The main idea behind the mobility concept is to combine the increasing demands on traffic to climate friendly and smart mobility solutions. The importance of smart transportation projects is emphasised by their goal of decreasing the use of gasoline-powered private vehicles. Furthermore, the time saving aspect of using and combining public transportation systems is brought up in the document.

The majority of space on the pages dedicated to smart mobility is taken by different projects planned. In the document the projects are subdivided into three categories. These categories, named immediate measures, core projects, bottom- up projects, and innovation topics, indicate of what importance a specific project is to the achievement of the overall objective and, for example, what projects support the core projects. To provide an overview of the smart public transportation projects, table 1 summarizes the relevant projects that refer to smart public transportation.

Table 1: Smart Public Transportation Projects Darmstadt

E-Carsharing	Electric car-sharing run with green power to reduce local emissions and greenhouse gases.
Mobility-App	An app which combines all mobility providers in one place leading to more efficient combination of different transportation systems.
Semi-Autonomous Trams	Chosen sections will be tested on the use of automated driving functions for times with low volumes of traffic. This shall optimize the transportation system management.

4.1.2 Public Involvement

The idea and therewith the process of becoming a smart city, arose in 2017 when the city was approached to take part in a competition hosted by an association of IT companies in Germany (Bitkom).

To participate in this competition the city of Darmstadt had to develop an overall concept of their smart city vision. During the process of developing a concept for this competition, an event was hosted in which citizens had the opportunity to give feedback and suggestions for improvements, and to make their own propositions on an already written concept. The involvement during this phase will not be used for the analysis following in the next chapter, as the actual process started once, the city of Darmstadt started working on a proper strategy document going beyond the concept created during the competition.

After having won the competition, the city of Darmstadt started to write and develop a strategy in which smart city projects and the strategic process were depicted. Therefore, a website was created on which solely information was provided, among others, about the progress of the smart city project. At the beginning of the strategy development phase, an event was hosted by the city and to which the public was invited to. This was called 'Digitalstadtarena' (Eng. digital city arena). During this event, participants were divided into so-called 'Themeninseln' (Eng. topic areas) referring to different fields of the smart city to inform, answer questions, to discuss openly with the public, and gather feedback as well as ideas.

The ideas and feedback that were collected during the digital city arena combined with the concept written for the competition were used to consolidate a first version of the strategy document. In order to present this to the public, another event was hosted during which the document and its content was presented to the citizens. Here, feedback and suggestions were asked for from the public. Moreover, there was a two-week online opportunity after the event to give further feedback regarding the projects and documents.

In the future, the city of Darmstadt is planning on using a mobile 'Stadtlabor' (Eng. city lab) which shall bring the city officials to the people. This is expected to increase the public involvement and the number of people engaged in the development of the city of Darmstadt. Subsequently, the process of developing a smart city and process of public involvement has not yet been completed.

4.2 Gütersloh

4.2.1 Smart Public Transportation Concept

The smart mobility concept of the city of Gütersloh is presented on a website. This website provides a platform that goes beyond a "normal" website. On the one hand, it presents the smart city vision and describes the Gütersloher strategy for the different fields of actions. On the other hand, the website invites the people to publish their own project ideas, 'like' other ideas, and, if registered, even

comment on other ideas and projects. The smart mobility section involves a description of the goals, visions, and the focus of change as well as many projects that are planned regarding smart mobility.

The core goal is to promote the interlocking of various transportation systems. In doing so, the city of Gütersloh aims at providing short ways that enable the citizens to get quickly from one place to another. By including smart mobility systems, the city intends to increase user´s flexibility, safety, comfort, and the environmental friendliness targeted in becoming a smart city.

The smart mobility projects are also presented on the website mentioned above. They are labelled accordingly to their current stage which differs in terms of what stage the projects have in the policy process. The different project stages are called 'Projektvorschlag' (Eng. project proposal) and 'Projektkandidat' (Eng. project candidate). In table 2, the projects that are connected to smart public transportation, are described.

Table 2: Smart Public Transportation Projects Gütersloh

Mobility-App	An app which combines all mobility providers in one place leading to more efficient combination of different, conventional, and new smart transportation systems.
UrbanLand MobilityHubs	The mixed-mobility-concept of mobility hubs provides a place at which different modes of transportation systems are available such as a sharing-platform for private vehicles, a network of green spaces, and the involvement of the local public transport.
Smarte "Mitfahrer-Bänke"	The familiar system of "Mitfahrbänke" shall become extended by installing touch displays to announce via the push of button where you want to be taken. The cars passing will be notified via push notification informed directly in front of the stops and at the entrances to the town and can take those waiting with them to their destination. This is regarded as a supplementation of conventional public transportation systems.
Autonomous circulating passenger transport in the Mansergh district	The aim is to create an autonomously circulating system that ensures autonomous neighbourhood mobility in the district of Mansergh.

4.2.2 Public Involvement

The idea and the process to become a smart city started in 2018. Although the idea derived from the major of Gütersloh, thus the city, the process can be understood as a bottom-up procedure, thus very

citizen-cantered, as the ideas were collected firstly by the citizens, transformed into a strategy, and then entered the political decision-making process.

The process started by a marketing campaign including posters, flyers, and press releases that shared first information and the public was invited to an opening event. Both were of informative nature. A more active mechanism of public involvement were the ‘Morgenmacher’, who are younger people until the age of 29. The younger generation was expected to introduce more unconventional and “crazy ideas” (Interviewee 1, p. 2).

Another mechanism was the ‘Denklabore’ (Eng. think tank), which were carried out at the beginning of the process and were divided into different fields of the subject. Within those think tanks, the status quo was evaluated; ideas were collected and clearly defined as well as discussed. The people involved in it were employees of the city as well as the so-called ‘Stadtexperten’ (Eng. city experts) who were citizens that could apply as such due to interest or expertise in the specific fields. The ideas that were collected and selected during the think tanks were presented to the public during the ‘Zukunftswerkstätte’ (Eng. future lab). These were events to which all citizens were invited to, and which were held to discuss and get feedback from a large number of citizens.

A further mode of involvement has been the ‘Ideenplatform’ (Eng. idea platform) which is an online forum to post ideas and project ideas which others can “like” if they support the idea and if registered the citizens can also comment on the ideas to give feedback or give suggestions for improvement.

Moreover a ‘Digitalboard’ (Eng. digital board) was invented on which people outside of Gütersloh could give their feedback on ideas, projects and give input that is less biased than the one that comes from the citizens of Gütersloh directly.

Finally, during the interview it was emphasized that the decisions on what projects are selected, and which not, was made in the city council, which may not be regarded as public involvement at first sight but is a basic democratic decision-making body with representatives elected by the citizens.

4.3 Iserlohn

4.3.1 Smart Public Transportation Concept

The smart mobility concept of Iserlohn is presented in a strategy document. What makes the case Iserlohn distinct and therefore important to this research is that Iserlohn actively includes it´s suburbs into the strategy and the planning process.

The core goal of the smart mobility concept of Iserlohn is to provide a city of short distances. Moreover, the city of Iserlohn also aims at reducing motorised private vehicle traffic by developing and promoting intermodality, improving connections between Iserlohn and its districts, to strengthening cycling and walking mobility. Table 3 summarizes the projects that are connected to smart public transportation.

Table 3: Smart Public Transportation Projects Iserlohn

Mobility-hubs at train station, inner-city ring, and suburban centres	Mobility-hubs link the different public transportation options in the road area. A large number of stations providing access to residential areas and workplaces is therefore crucial for integration into everyday traffic. In addition to expanding the existing mobility stations, Iserlohn also needs to set up smaller mobility stations in the suburban centres and the inner-city ring.
"Bürgerbus"	In the north of Iserlohn, a "Bürgerbus" will be implemented to create more connections, especially between small villages.
Test track „e-BUS"	The aim is to set up a test track on autonomous driving in cooperation with the University of Applied Sciences Südwestfalen, which replaces the bus shuttle service between the city railway station and the university of applied sciences with autonomous buses.
Pilot-project "autonomous driving in the industrial estate"	In the course of planning the inter-municipal business parks, the claim is formulated to apply innovative mobility and logistics concepts. In cooperation with the University of Applied Sciences Südwestfalen, a pilot project "Autonomous Driving in the Industrial Estate" is being developed.
Traffic-Labs	The following plans can be tested in temporary traffic laboratories: Road narrowing, reduction of parking spaces, road blocking, speed reduction, one-way road traffic, priority public transport etc.

Additionally, the suburbs of Iserlohn are presented via so called "Ortsteilsteckbriefe". To illuminate this part of the concept, I will shortly summarize one of the "Ortsteilsteckbriefe" in the following. For Henning as a suburb of Iserlohn regarding smart mobility it is planned to develop a parking concept as well as mobility hubs (Mein Iserlohn 2040, 2020, p. 130). Although every suburb has its own little section, the overall projects above also resemble the projects found among the villages. Thus, the analysis will focus on the general projects presented in the table above. If the analysis had had its focus on the smart mobility concept in general, it would have been possible to incorporate the villages more into the analysis. However, since the majority of projects within the villages are connected to improving conditions for pedestrians and cyclist, it does not make any sense to include them in more depth as my thesis focuses on smart public transportation projects only.

4.3.2 Public Involvement

The smart city process in Iserlohn began 2018 when the first strategic meetings, named ‘Zukunftswerkstatt’ (Eng. future lab) and ‘Strategiewerkstatt’ (Eng. strategy lab), took place. These were internal administrative processes that did not include any public involvement and thus are not discussed any further.

The public launch of the project, that took place in April 2019, marked the start of involving the public. This event was of informative nature at which the topics that came up during the focus rounds were presented. Nevertheless, the public was able to provide city officials with first remarks and ideas. Although the document calls this event the starting point of including the citizens, in this analysis also the ‘Fokusrunden’ (Eng. focus rounds) are considered as some sort of public involvement as besides politicians, also members of associations, and initiatives were involved. During these focus rounds, which took place before the opening event, the status quo was assessed and central guidelines and fields of actions for urban and suburban development were developed.

Another participation possibility was the creation of a website. On the one hand, this website was used to provide information about the project itself and about upcoming events as well as outcomes. On the other hand, this website provided a platform for the public to bring in their own ideas and assess those ideas shared by others. Another aspect of online involvement was the development of a survey about the status quo of the city.

Another option for citizens to be involved in the process were ‘Ortsteilspaziergänge und -werkstätten’ (Eng. district inspections and district labs). This was an essential aspect and different to the other cases, as here, the focus lied on the villages around Iserlohn indicating the extent of the intermunicipal cooperation. This mechanism of involvement included 27 district inspections and 10 district labs which provided the basis for the strategy document in which each village has its own small smart city concept.

Furthermore, during the ‘Bürgerwerkstätten’ (Eng. citizen lab) the already planned concepts were presented and the public was able to discuss any disagreements or adjustments to the proposal. Also, during this mechanism of public involvement, the citizens of each village had a say in this phase. This makes the planning more coherent and symbolizes that city planning does not stop at the boundaries of a town.

The last two involvement opportunities were ‘Jugendbeteiligung’ (Eng. youth participation) which means that the youth was also represented in the process by at least one representative of the children and youth council. The other involvement mechanism was the ‘Öffentliches Abschlussforum’ (Eng. public final forum) during which the final vision of the strategy document was presented. Here,

the city mentions that the involvement of the public would not be over yet but will continue in future city planning activities.

5. Analysis

The purpose of this chapter is, on the one hand, to gain insight into the differences of the smart mobility concept and the smart public transportation projects among the three cases described above. On the other hand, this chapter aims at using the theoretical models introduced in chapter 2, to categorize the different mechanisms of public involvement found during the planning process within the cases. Furthermore, the applicability of these models will be discussed. The first step of the analysis is to depict the differences between the selected cases. Therefore, the public involvement mechanisms that have been observed in chapter four, serve to make an attempt to explain the differences found in the smart mobility concept and, more in-depth, in the smart public transportation projects. The second step of the analysis is to categorize the mechanisms of public involvement into the models and evaluate how applicable they appear.

5.1 Comparison of Smart Public Transportation Projects

This first part of the chapter aims to answer the primary research question of this thesis. This part of the analysis is guided by addressing the second and third sub-question, on what the differences of the smart mobility and smart public transportation projects are and what differences we can observe in the public involvement mechanisms. While detecting the differences of smart mobility section and the smart public transportation projects, these findings will be explained by the different public involvement mechanisms found in the previous chapter. Furthermore, at the end of this section, besides answering the primary research question, I will also reflect on the expectations made in chapter 2.3.

5.1.1 Comparison of Public Involvement Mechanisms

Before, getting into the comparison of public involvement mechanisms, I want to emphasise that the process of becoming a smart city is described by Interviewee 1 as a process which basically never ends (Interviewee 1, p. 2). Subsequently, the public involvement mechanisms described in the present thesis are observed at this stage in time and may vary in the future.

Firstly, each case developed a website. Despite varying in its purpose this means that each case included a mode of e-participation during the phase of planning. This observation will gain relevance in chapter 5.2.2. Further, in neither of the cases citizens had any final decision-making power. The main reason for this is that there were technical decisions to be made during the process which the citizen – due to the lack of knowledge – cannot always make (Interviewee 1, p.5; Interviewee 2, p.3).

The biggest difference is in terms of the way the process has been organized. While in Darmstadt and Iserlohn the city came up with first ideas and draft versions of a strategy, the city of Gütersloh approach the process differently. The strategy development began by collecting and developing ideas and projects with the public in the "Denklaboren". Further the citizens could present and assess their ideas online at the "Ideenplattform". In Darmstadt and Iserlohn, before asking the public for feedback, ideas, and project suggestions, the rough ideas and structures of what the smart city could look like were already elaborated and only expanded and adjusted by and with the public at a later stage.

With regard to Iserlohn – distinct in their inclusion of their suburbs – the only difference to the other two cases is that in Iserlohn, there were district inspections and district labs dedicated to actively include the Iserlohner suburbs. Unlike the other two cases, this case is distinct with regard to the two mechanisms of public involvement just mentioned as the citizens living in the Iserlohner suburbs are represented.

Lastly, what sticks out is that Darmstadt contains the smallest number of involvement opportunities. Whether this has any significant effects is part of the analysis in the next section. In the following, explanations will be searched for that explain differences in the smart public transportation projects.

5.1.2 Between-Cases Analysis of The Smart Public Transportation Projects

The smart public transportation projects that are analysed in the following are retrieved form the case description in chapter 4. Hereby, similar in all cases is that the projects planned in order to become a smart city stand out from the rest of what is written about the goals and visions. The projects are listed and described with a short text or bullet points only, instead of being presented in a long text. Furthermore, in the strategy document of Darmstadt and Iserlohn, the projects are presented in a table. One reason for the projects standing out form the rest of the text might be that it becomes more clear what changes will happen in order to become a smart city. For this reason, the projects may be even regarded as the most important element of the strategy document which may also explain why they are presented separately. An additional reason for this may also be that the projects should be presented in a way easy to understand for everyone, this was especially considered in Darmstadt. Their strategy document was written in "verständlicher Sprache" (Interviewee 2, p. 4) due to the suggestion of a citizen. Thus, being written less complex, in short sentences or bullet points, gives everyone the opportunity for understanding independent from their education.

Another, more general observation is the difference in how the smart city concept is presented. Although, this does not directly refer to the research question asking for the explanation of differences in the smart public transportation projects, this difference is important as it rests on the difference of

public involvement and is thus worth mentioning. While Darmstadt and Iserlohn present their concepts in a strategy document, the city of Gütersloh presents their concept on a website. A possible explanation for this difference may be the "Ideenplattform" used in Gütersloh. This mechanism of public involvement is a very interactive one which invites, in a very uncomplicated way, every citizen to participate in the process from home, at work, or on the way. Furthermore, the citizens can either like or comment the ideas proposed by other citizens. Since these ideas are incorporated on the website and still can be liked and commented, the website presents the possibility to develop the process still interactively. Unlike in the other cases in which, in order to incorporate new ideas and projects, a new strategy paper is needed to be written. Subsequently, this difference can clearly be linked to differences in the involvement of the public in the planning process.

The primary difference between the smart public transportation projects is that Iserlohn has more smart public transportation projects than the other two cases. This may derive from the fact that the city of Iserlohn includes not only the needs and desires of the citizens living in Iserlohn directly but also of the citizens that live around Iserlohn. On the one hand, more people are involved, on the other hand, a lot of different travel connections between Iserlohn and the villages need to be included.

Another observation is that Iserlohn includes the project of traffic labs. These traffic labs help to test traffic solutions temporarily. According to the strategy document of Iserlohn they were important to create acceptance and consciousness (Mein Iserlohn 2040, p. 112). This links to what Chen (2019), Yang et al. (2020), and Liljamo et al. (2018) found out about factors increasing the acceptance of smart mobility developments (chapter 2.3). This kind of project cannot be found in the other two cases. However, unlike for the previous observation, the public involvement mechanisms cannot be used to explain this difference in the projects.

Gütersloh and Iserlohn share that each case has a smart public transportation project which aims at brining all different mobility options together in one place. For Gütersloh that is the "UrbanLand MobilityHub" and for Iserlohn that are the "Mobilitätsstationen". This enables more flexible travel options for the citizens. This differences neither can be clearly linked to public involvement and thus not be explained by it. A possible reason for this difference could be the goal that each city pursues with their smart mobility concept. Since these goals also differ in between the cases, this might explain why Darmstadt does not include some sort of mobility hub. Unfortunately, analysing this would go beyond the scope of this bachelor thesis.

Finally, in Gütersloh and Darmstadt so-called "Mobility-Apps" are planned. These apps provide information about the public transportation options collected in one app. This enables the citizens to better plan what option they can use in order to go to places. As described in chapter 5.1.1, all cases have a mode of e-participation included in their involvement of the public. Both the mobility app as well as e-participation are linked to ICT. Thus, the fact that there is no mobility app planned in Iserlohn could

not be explained by the lack of including e-participation and therefore not supporting the use of ICT technologies like apps.

5.1.3 Interim Conclusion

After having analysed the smart public transportation projects regarding the public involvement mechanisms above which connects the research to the second and the third sub-question, I will now reflect on the expectations that I developed with regard to the primary research question. Starting with EXP1. *Smart public transportation projects are initiated only or largely by the citizens themselves instead of by the city*: This expectation is especially true for Iserlohn and Gütersloh. The idea platform of Gütersloh and the website developed to share ideas in Iserlohn encourages citizens more extensively due to their easy accessibility and general concept to share project ideas. Also, the case Darmstadt encourages this, however, to a smaller extent by primarily collecting ideas during two events taking place for the public during the process.

Continuing with EXP2. *Smart public transportation projects are open for discussion in order to portray the interest of as many citizens as possible in order to get a wide acceptance and intention to use these transportation systems*: During the data analysis, I observed that every case had events or some other opportunity to give feedback and to make suggestions on the projects. Therefore, the first part of the expectation can be accepted. However, for the second part displaying the explanation, it can be the case, due to what the literature says about the relation between acceptance of smart mobility solutions and the use of smart public transportation projects, but the data on public involvement available did not reveal evidence for this expectation.

Concluding with EXP3. *The case including its suburbs has a larger variety of smart public transportation projects than the other cases, as there are more citizens involved having a larger variety of demands on smart mobility*: Although, the list of smart public transportation projects is slightly longer for the case of Iserlohn, I would not draw from this mere observation that this is purely the result of Iserlohn having incorporated also its suburbs into the smart city development.

To summarize the findings of this first part of the chapter and with special regards to the findings in sub-chapter 5.1.2, it can be concluded that while some differences of the characteristics of smart public transportation projects relate to the distinctiveness of public involvement, other differences in smart public transportation projects cannot be explained by differences in public involvement. Therefore, the answer to the primary research question of this bachelor thesis is that public involvement can only explain the differences in smart public transportation systems to a limited extent.

5.2 Public Involvement Mechanisms

In this part of the chapter, firstly, the theoretical models introduced in chapter 2 are used to categorize the public involvement mechanisms present during the planning process in Darmstadt, Iserlohn, and Gütersloh. Secondly, this is followed by an evaluation of the theoretical models which results in answering the secondary research question of the present thesis.

5.2.1 Categorization and Comparison of Public Involvement Mechanisms

After having depicted the public involvement mechanisms of each case, having used them as an explanation for differences in smart public transportation projects, and having made some final remarks about them, the mechanisms of public involvement are now categorized into the three theoretical models of public involvement presented in chapter 2. The following tables show the different models and what levels and stages they include. Each table also includes the public involvement mechanisms found in the cases. These mechanisms are aligned to the levels and stages in accordance with the theoretical foundation about what each different level and stages says in terms of the extent of public involvement.

The first table shows the public involvement mechanism categorized into the IPA2 model (described in chapter 2.2.2).

Table 4: Typology of 'Spectrum of Public Participation'

Public involvement mechanism	*Cases*		
	Darmstadt	Gütersloh	Iserlohn
Inform	- website providing information, sharing progress, informing about events	- Marketing campaign (flyers, posters, press releases) - Opening event	- Website providing information about project, upcoming events, and outcomes - 1st event
Consult	- 1st event during competition - Digitalstadtarena - 2nd event presenting the strategy document	- Zukunftswerkstatt - Digitalboard	- 1st event - Bürgerwerkstatt - Jugnedbetiligung - Ortsspaziergang - Ortswerkstatt
Involve	- Digitalstadtarena	- Denklabor - Zukunftswerkstatt - Ideenplattform	- Bürgerwerkstatt - Ortsspaziergang - Ortswerkstatt - Website
Collaborate		- Denklabor - Zukunftswerkstatt	- Bürgerwerkstatt - Ortsspaziergang

	/	- Ideenplattform	
Empower	/	/	/

The second table shows the public involvement mechanism categorized into the 'Typology of Participation' model (described in chapter 2.2.3).

Table 5: Typology of 'Typology of Participation'

Public involvement mechanism	*Cases*		
	Darmstadt	Gütersloh	Iserlohn
Passive Participation	/	/	/
Participation in Information giving	- Website providing information - 1st event during competition - 2nd event presenting the strategy document	- Opening event - Website providing information	- 1st event - Bürgerwerkstatt - Website providing information
Participation by Consultation	- Digitalstadtarena	- Denklabor - Zukunftswerkstatt - Ideenplattform - Digitalboard	- Jugenbeteiligung - Website - Ortsspaziergang - Ortswerkstatt - Bürgerwerkstatt
Participation for Material Incentives	/	/	/
Functional Participation	- Digitalstadtarena	- Denklabor	- Ortsspaziergang - Ortswerkstatt
Interactive Participation	/	/	/
Self-Mobilization	/	/	/

The third and last table shows the public involvement mechanism categorized into the 'Ladder of Participation' model (described in chapter 2.2.1).

Table 6: Typology of 'A ladder of Participation'

Public involvement mechanism	*Cases*		
	Darmstadt	Gütersloh	Iserlohn
Manipulation	/	/	/
Therapy	/	/	/

Informing	- website providing information, sharing progress, informing about events	- Marketing campaign (flyers, posters, press releases) - Opening event	- Website providing information about project, upcoming events, and outcomes - 1st event
Consultation	- Digitalstadtarena	- Denklabor - Zukunftswerkstatt - Ideenplattform - Digitalboard	- Jugenbeteiligung - Website - Ortsspaziergang - Ortswerkstatt - Bürgerwerkstatt
Placation	/	/	/
Partnership	/	/	/
Delegated Power	/	/	/
Citizen Control	/	/	/

5.2.2 Evaluation of Theoretical Models

The categorization of the public involvement mechanisms, the tables show above, were made in order to assess how applicable conventional models of public involvement still are. Before specifically addressing the missing e-participation aspect in the models, I will comment on some other aspects that stand out regarding the applicability of the models.

Firstly, the public had, in none of the cases, actual final decision-making power. Reasons for this, given by the Interviewees, were that the public lacks specific (technological, administrative) knowledge necessary in order to judge the realizability of projects (Interviewee 1, p. 5; Interviewee 2, p. 3). Unlike in the two other models, the fact that the public was not involved in the final decision making does not become as clearly in the IAP2 model. Subsequently, the other two models differentiate more clearly between involving the public in developing an idea and actually deciding on the realization of this idea.

By applying the models, another observation can be made. Regarding the model by Pretty, it can be seen that the stage ‘material incentive’ is not present in any of the cases. Unlike for the aspect of the missing actual decision-making power mechanisms, there cannot be found any explanation in the available data justifying the missing public involvement mechanisms for ‘material incentive’. Therefore, a conclusion that can be drawn is that this stage is no longer relevant in how public involvement is driven nowadays.

Additionally, the first and second level ‘Manipulation’ and ‘Therapy’ of Arnstein´s model are not present during the planning process in any of the three cases either. These two levels are described

as pretending to involve the public. Any of the available data on public involvement gave hints to involvement of the public solely being an illusion. Thus, as any of the cases possesses public involvement mechanisms that aim at masking non-participation as participation, these two levels are also expected to be out-dated regarding the purpose of public involvement nowadays. Also 'passive participation' in the model by Pretty was not found in the analysis of the cases for the same reason why 'therapy' and 'manipulation' was not found.

After having drawn some general conclusions about the applicability of the models, I will now focus on addressing the secondary research question of the present thesis. In order to approach this question, I came up with EXP4. *Conventional models of public involvement are still applicable despite the lack of including e-participation*. The case analyses found several e-participation mechanisms such as the idea platform, the digital board and a number of websites having been present in each case. In the tables above, one can observe that these different e-participation mechanisms are not missing in none of the models. Subsequently, although none of the three theoretical models includes specific e-participation stages or levels, the public mechanisms connected to e-participation found in each case can be categorized into the model anyways. An explanation for this observation could be that the models, despite of being conventional, are not narrowed down to specific and concrete types of involvement. To illustrate this further, none of the models defines, for example, the stage or level of informing as: information provided in newspaper articles, posters and via language during events in which the public can come to – such a definition would not allow a website as a mode for providing information. This means that the three models leave room for interpreting the scope of the different levels and stages to the extent that e-participation such as information giving via a website can be categorized into the models.

All in all, it can be concluded that the conventional models introduced in chapter 2 are still applicable nowadays, despite their lack of specifically including mechanisms of e-participation. However, there are other aspects, such as the stage 'material incentive' or the level 'therapy' and 'manipulation', that restrict the application of the 'Ladder of Participation' and the 'Typology of Participation' models in today's decision-making processes.

6. Conclusion

The main goal of this thesis has been to understand the influence of public involvement in the planning process of smart cities which are deeply connected to citizen-centred approaches. Specifically, the primary aim has been to answer the question to what extent differences in public transportation projects between different smart cities can be explained by public involvement in the planning process. Generally, the findings prove that public involvement does influence the outcome of urban planning. This is seen by the difference of presenting the smart city concept that can be explained by the design of public involvement, as well as the difference of the number of smart public transportation projects, depending on the variety of citizens involved in the process. Nevertheless, not all differences in smart public transportation projects can be explained by public involvement. A meaningful explanation for this could not be identified.

In order to make more specific statements about the extent to which public involvement explains the differences of urban planning, future research on the subject needs to gather information about what project suggestions came at what stage/level during the public involvement process. This means that the data collection of public involvement mechanisms needs to be adjusted. Additionally, since the number of cases is limited in this thesis, future research may include a larger number of cases to confirm and find more profound patterns of how public involvement mechanism can explain differences in decisions about infrastructure. Consequently, the conclusions drawn from the interpretations of the different observations need to be treated carefully. And, last but not least, once the concept of smart city becomes more present in rural areas and the publishing of analysable strategy documents increases, more cases evolving around rural areas are needed to be included in the research as well.

Regarding the secondary research question, through the findings of my research, it can be concluded that the conventional theoretical models can still be applied even though they lack the incorporation of e-participation in the model. The models allow to assess the intensity the public involvement has and is equally able to categorize modes of e-participation. Nevertheless, future research would need to contrast these models to e-participation models to confirm my findings. Additionally, just as it is the case for the primary research goal of this thesis, in order to confirm my findings also a larger number of cases would be needed to be analysed.

Furthermore, it is important to keep in mind that the process of becoming a smart city is expected by the Interviewees to never end which means that new smart public transportations systems may eventually develop, and also further mechanisms of public involvement may arise in the future. This shows that the current status of the strategy and also the public involvement mechanisms are just a station along the way. Subsequently, the results of my study will probably change over time. This is supported by what I2 said about the “digitale Stadtlabor”, a new mechanism of public involvement starting this summer (I2, p. 3) which will probably also lead to new projects and project ideas.

7. References

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8. Appendix A: Documents

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