

# The politics of Mobility as a service

## A case study of the power relationships in two MaaS-pilots in the Netherlands



Msc Thesis Environmental Policy Group

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Submission date: 7<sup>th</sup> of June, 2022

Curriculum: Msc Urban Environmental Management

Chairgroup: Environmental Policy

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Master's thesis (36 ECT)  
Msc Urban Environmental Management  
Chair Group Environmental Policy  
Wageningen University & Research

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Submitted on  
7<sup>th</sup> of June, 2022

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Cover photo: [https://miro.medium.com/proxy/1\\*nFLp-SPqewa74ct7ODjWxw.jpeg](https://miro.medium.com/proxy/1*nFLp-SPqewa74ct7ODjWxw.jpeg)

# I Preface

In the summer of 2019, I did a consultancy project for the ministry of Infrastructure and Water management. Together with students from a diverse range of study backgrounds we looked into the different possibilities for sustainable mobility in the Netherlands. This project was my introduction to 'Mobility-as-a-Service' (MaaS). It was this specific project that triggered my enthusiasm for studying environmental problems in urban environments, and made me choose for the master Urban Environmental Management. During my master, my interest in MaaS was always there and I kept on following the MaaS-programme in the Netherlands by my own initiative. I perceive the knowledge about the urban mobility sector, that I gained because of this thesis, as a valuable addition to the rest of my masters. It has definitely contributed to a more complete understanding of urban environmental management.

Because of health problems, I had to take a step back from my initial ambitions to start my thesis right away in September 2021. Although this first felt as a personal failure, I now look back at it as a crucial tipping point for my mental and physical health status. When starting my thesis at the beginning of November, I promised myself to listen to my own boundaries. It was my personal goal to enjoy my thesis process, and to experience it, not as a mandatory project, but as a personal opportunity to develop my knowledge on the topic of MaaS. Looking back on it, I can proudly admit that I indeed enjoyed almost all stages of the research process. Taking the time I need, and accepting the less motivating phases of the process helped me to stay focused and to prevent stressful times.

Writing this thesis would have never been possible without the support and help of many beautiful people in my environment. First of all, I would like to thank all the people that were willing to give an interview. These interviews were not only providing me with data, but were above all, really interesting conversations that were valuable personal experiences for me. Second, I want to express my gratitude to my first supervisor, Sanneke Kloppenburg. Her understanding as response to my personal situation meant a lot to me. I highly enjoyed our meetings in which she definitely challenged me to look critical at my own research, especially in the writing process. Besides, I would like to thank my physical therapist for not being afraid to confront me with my own pitfalls. She definitely contributed to my positive experience of this whole thesis process.

Finally, I would like to name some specific people that deserve some credits for helping me out during the research process. Saskia, Céline, Marleen, Jaimie and Iris provided me with helpful feedback on respectively the proposal, the interview guide, the code-books and the conclusion. I am also very grateful for my friends and roommates, who always took the time to listen to my insecurities, and also gave me the room to express my enthusiasm on the project. Lastly, I would like to mention three specific persons in my life, that are always there for me: Marleen, Mum and Dad: thank you for the unconditional support.

## II Abstract

Urban mobility is a threat for local air quality and a serious contributor to climate change in the Western world. Cities are therefore experimenting with traffic related innovations to stimulate the sustainable urban mobility transition. One of these innovations is Mobility-as-a-Service (MaaS). MaaS offers a user-centric approach for mobility by offering an all-inclusive app that can be used for planning, booking, and paying your travel with different kinds of transport modes. Studies that investigate MaaS as a socio-political system are extremely limited, but could give valuable insights on the role of power in (re)shaping the niche-regime interactions of the sustainable urban mobility transition. In this thesis, such an approach was taken, by studying the role of power in shaping the relation between MaaS and the current mobility regime in the Netherlands. With the help of the ‘transition as discourse’ (Audet, 2016), a document-analysis of governmental documents was conducted. It was found that the Dutch government framed MaaS in mainly a technocratic manner, and as part of the digital mobility transition instead of the sustainable urban mobility transition. The Power-In-Transition framework (Avelino, 2017), and the Multiple-Actor Perspective (Avelino & Wittmayer, 2016) functioned as the theoretical frameworks for analysing the power relations and dynamics in the MaaS-ecosystem. By conducting several interviews with different actors from the MaaS-ecosystem, it became clear that this ecosystem is an arena of many different actors active on niche and regime level. Power is not something static, but rather dynamic and something that changes over time. Two important shifts in power dynamics were visible in the niche-regime interaction of MaaS and the mobility regime: (1) a shift from mainly cooperation and synergy to competition; and (2), a shift from state actors as dominating actors to market actors as dominating actors in the MaaS-ecosystem. These two shifts show the presence of a reinforcing power exercise by the regime towards the niche. This power exercise might have limited the development of the MaaS niche to some extent, but is not necessarily restricting the digital mobility transition as a whole. Although the analysis of the micro-politics of MaaS shows that transitions can only be managed to a certain extent, this thesis concludes that sustainability has to be prioritised in the MaaS-frame to steer MaaS more effectively in the direction of sustainable urban mobility, instead of in the direction of digital mobility only.

**Keywords:** *Mobility-as-a-Service, MaaS, power, power relations, power dynamics, discursive framing, niche-regime interaction, sustainability transitions, transition politics, the Netherlands, sustainable urban mobility*

## III Summary for managers and policymakers (in Dutch)

Stedelijke mobiliteit draagt in belangrijke mate bij aan de uitstoot van broeikasgassen in de westerse wereld. Steden van over de hele wereld zijn daarom aan het experimenteren met duurzame vormen van mobiliteit om zo de transitie naar duurzame stedelijke mobiliteit te bevorderen. Eén van die innovaties die past binnen deze transitie is Mobility-as-a-Service (MaaS). MaaS gaat over het aanbieden van een gepersonaliseerd reisaanbod, door middel van het gebruik van een integrale app waarmee gebruikers hun reis kunnen plannen, boeken, en betalen. De app kan gebruikt worden voor meerdere vervoersmodaliteiten. Ook Nederland is aan het experimenteren met MaaS. In 2018 startte de Nederlandse overheid met zeven regionale MaaS-pilots om zo, op langere termijn, het mobiliteitssysteem in Nederland te kunnen optimaliseren. Het vormgeven van zo'n systeem door middel van beleid kan worden gezien als een vorm van transitie governance. Ter verbetering van transitie governance wordt stedelijke mobiliteit vaak onderzocht vanuit het perspectief van een socio-technische systeem. Dit perspectief gaat er vanuit dat innovaties in beleid en techniek de transitie naar een duurzamere samenleving bevorderen. Echter, is er vanuit de wetenschap een groeiende vraag om transities ook vanuit socio-politiek perspectief te bekijken. Dit perspectief gaat er vanuit dat transities ook bevorderd of tegengehouden kunnen worden door politieke structuren en macht, voorkomend uit verschillende belangen en relaties tussen actoren.

Uit de wetenschappelijke literatuur komt MaaS naar voren als een innovatie die het potentieel heeft duurzaam mobiliteitsgedrag te stimuleren. Echter, is er nog maar weinig bewijs dat MaaS daadwerkelijk duurzaam is en in welk opzicht. Daarnaast bestaat het MaaS-ecosysteem uit veel verschillende actoren en stakeholders en is het nog niet altijd duidelijk wie welke verantwoordelijkheid draagt bij het vormgeven en de uitvoering van MaaS. Die verscheidenheid aan actoren impliceert bovendien dat machtsrelaties een belangrijke rol zouden kunnen spelen in het vormgeven van MaaS en daarmee dus ook van invloed zouden kunnen zijn op de algehele transitie naar duurzame stedelijke mobiliteit. Door MaaS in relatie tot het huidige mobiliteitsregime te onderzoeken aan de hand van een socio-politiek perspectief, kunnen waardevolle inzichten opgedaan worden over hoe bepaalde machtsrelaties worden vormgegeven en/of gereproduceerd. Een regime vanuit deze context moet worden begrepen als de gevestigde gang van zaken in een samenleving. Inzicht krijgen in de relatie MaaS-mobiliteitsregime is van belang om te begrijpen welke rol de politiek achter MaaS speelt bij het vormgeven van de transitie naar duurzame mobiliteit. De volgende onderzoeksvraag is daarom opgesteld: *Wat is de rol van macht in het vormgeven van de relatie tussen MaaS en het huidige mobiliteitsregime in Nederland?*

Deze onderzoeksvraag is beantwoord door enerzijds de discursieve framing van MaaS door de Nederlandse overheid te onderzoeken, en anderzijds de machtsrelaties binnen het MaaS-ecosysteem. Hiervoor zijn het 'transition as Discourse (Audet, 2016), Power-In-Transition framework (Avelino, 2017) en het Multi-Actor-Perspective (Avelino & Wittmayer, 2016) gebruikt. Deze theorieën zien macht als iets dat continue wordt uitgeoefend, en dus niet als iets dat men bezit. Macht is dynamisch, niet statisch. Er bestaan verschillende vormen van macht, en afhankelijk van de capaciteit om nieuwe hulpmiddelen te creëren of in te schakelen kunnen actoren meer/minder macht of verschillende soorten macht uitoefenen. Discursieve frames – een coherent geheel aan bepaalde interpretaties van de realiteit – kunnen worden ingezet als hulpmiddel en dus door actoren worden gebruikt om macht uit te oefenen.

Door overheidsdocumenten over MaaS en toekomstige mobiliteit te analyseren kon het MaaS-frame worden onderscheiden: Het MaaS-frame bestaat uit een coherent verhaal over wat MaaS zou moeten zijn, vormgegeven door de overheid. Zij presenteert MaaS als innovatief project waarbij samenwerking centraal staat. MaaS wordt niet zozeer gezien als onderdeel van de duurzame mobiliteitstransitie, maar eerder als onderdeel van de digitale mobiliteitstransitie. De term 'duurzaamheid' wordt dan ook slechts een aantal keer genoemd, maar nergens expliciet uitgelegd of toegelicht. Grofweg kunnen er drie discursieve uitspraken onderscheiden worden die het verhaal van MaaS compleet maken: (1) MaaS is een win-win oplossing voor zowel business, de overheid, als de samenleving als geheel, (2) MaaS moet gereguleerd worden (3) MaaS is iets waarvan we kunnen leren. Door deze drie uitspraken verder vorm te geven in haar framing, positioneert de overheid zichzelf als aandrijver en sleutelfiguur van MaaS. Daarmee bedeeft ze zichzelf een machtige positie

toe en tegelijkertijd weet zij hiermee MaaS in een positief daglicht te zetten. Tot slot, door de nadruk te leggen op het belang van een goede business case voor het voortbestaan van MaaS, wordt MaaS als economische ruimte geframed.

Dit MaaS-frame blijkt een belangrijke rol te spelen wanneer we kijken naar de machtsrelaties binnen het MaaS-ecosysteem in de praktijk. Deze machtsrelaties zijn onderzocht aan de hand van interviews met actoren betrokken bij de MaaS-pilot in Amsterdam Zuid, en de MaaS-pilot in Eindhoven. Beide pilots zijn gericht op een brede inzet van MaaS in stedelijke gebieden, en het op langere termijn opschalen van MaaS naar de rest van Nederland. Door onderscheid te maken tussen markt actoren, overheidsactoren en faciliterende actoren, konden verschillende machtsrelaties en machtsdynamieken worden blootgelegd. Onder faciliterende actoren vallen organisaties of individuen die een verbindende rol spelen tussen markt, overheid en de privé sfeer. Zij kunnen weliswaar overlappen met de overheid of de markt, maar zijn vanwege hun verbindende rol binnen MaaS dan alsnog als faciliterende actor gecategoriseerd.

In de voorbereidende fase van de pilots blijkt dat coöperatie en synergie de dominerende machtsdynamieken zijn (zie tabel I). Dit kan deels worden verklaard vanuit het feit dat de overheid een trekkende rol speelt gedurende de voorbereiding en dus ook de kans heeft om samenwerking via haar MaaS-frame als belangrijk aspect te benadrukken. Er heerst een optimistische sfeer onder actoren om er samen iets van te maken, en overheidsactoren en faciliterende actoren zijn actief bezig de MaaS-aanbieder te ondersteunen bij het tot stand brengen van MaaS. Alhoewel deze samenwerking en synergetische dynamiek niet per se verdwijnt, verschuift hij wel wat meer naar de achtergrond gedurende de implementatie fase van de pilots. Wanneer MaaS in praktijk wordt gebracht, blijken er een aantal zaken te zijn die het verder ontwikkelen van MaaS belemmeren. Deze komen voort uit het huidige mobiliteitsregime. Gevestigde structuren binnen de overheid over onder andere het delen van data, maar ook de traditionele concessie structuur tussen het openbaar vervoer en de overheid, maken de uitvoering van MaaS veel minder flexibel en zorgen ervoor dat experimenteren met MaaS belemmerd wordt. Bovendien speelt ook de uitbraak van Covid-19 een rol. De pilots worden mede hierdoor vertraagd. Al deze factoren geven machtige markt actoren de kans om juist meer te gaan doen met MaaS. Zij beginnen met het ontwikkelen van hun eigen MaaS initiatieven. Dit brengt meer competitie met zich mee. Terwijl marktpartijen een grotere rol gaan spelen in het MaaS-ecosysteem, neemt de invloed van de overheid juist af en daarmee ook de invloed van het MaaS-frame. Concluderend kan er gesteld worden dat er twee verschuivingen in de machtsdynamiek plaatsvinden: (1) van coöperatie en synergie naar competitie, en, (2) van overheidsactoren als belangrijkste actor, naar marktactoren als belangrijkste actor in het MaaS-ecosysteem.

Tabel I: De drie meest voorkomende machtsdynamieken in het Nederlandse MaaS-ecosysteem (uit: Avelino, 2017)

Coöperatie	Partij A kan meer of minder macht uitoefenen dan partij B, maar A en B hebben dezelfde doelen en werken dus samen.
Synergie	A en B oefenen verschillende soorten machten uit, gebaseerd op toegang tot verschillende soorten hulpbronnen. Daarmee ondersteunen ze elkaar.
Competitie	Partij A en B hebben exclusieve doelen die met elkaar concurreren, en de ene partij oefent vaak meer macht uit dan de andere.

De toekomst van het MaaS-veld is onzeker. Enerzijds komt dit door de impact van Covid-19. Onderzoek naar vergelijkbare versturende veranderingen zoals Covid-19 is nodig om de toekomstige impact hiervan te kunnen managen. Met de huidige oorlog in Oekraïne ligt een volgende versturende verandering voor de mobiliteitstransitie wellicht alweer op de loer. Anderzijds wordt die onzekerheid veroorzaakt doordat de MaaS casus in Nederland aantoont hoe dynamisch macht kan zijn en dat machtsdynamieken continue kunnen veranderen. Uit de interviews kwam naar voren dat MaaS betrokkenen het als zeer reëel zien dat grote openbaar vervoersorganisaties, zoals de Nederlandse Spoorwegen(NS), of grote big tech organisaties, zoals Google, de MaaS markt zullen overnemen. Tegelijkertijd lopen de pilots eind 2022 af en betekent dit dat de overheid zich alleen maar meer naar de achtergrond zal bewegen in het MaaS veld. Er is daarmee een

groeïende kans dat competitie als machtsdynamiek nog meer zal gaan domineren. Dit vraagt om een open discussie over de toekomstige rol van de overheid, waarin ethische vragen gesteld moeten worden zoals “Welke rol moet de overheid op zich nemen in het vormgeven van MaaS?”, “Tot in welke mate staan wij als samenleving toe dat big tech organisaties of de NS de publieke service van mobiliteit aanbieden?”, en “Wat voor machtsdynamieken zouden we graag willen zien in het toekomstige MaaS-ecosysteem?”. Deze vragen zullen niet alleen wetenschappers zich moeten stellen, maar zeker ook beleidsmakers, om in de nabije toekomst met onbedoelde machtsverschuivingen te kunnen dealen.

De realisatie dat macht dynamisch is en de toekomst dus onzeker, maakt dat beleidsmakers slechts tot in bepaalde mate de duurzame mobiliteitstransitie kunnen beïnvloeden. Echter, de invloed van het MaaS-frame van de Nederlandse overheid toont aan dat er weldegelijk ruimte is voor sturing vanuit beleid. Op dit gebied kunnen beleidsmakers meer verantwoordelijkheid nemen. De transitie naar duurzame mobiliteit wordt nu slechts als vaag en breed begrip ingezet, en als het om MaaS gaat wordt er slechts verwezen naar de digitale mobiliteitstransitie zonder de duurzaamheidstransitie expliciet te benoemen. Duurzaamheid wordt als uitkomst van MaaS automatisch aangenomen, zonder dat wordt uitgelegd wat hieronder wordt verstaan of welke expliciete duurzaamheidsdoelen hierbij komen kijken. Hiermee bestaat het risico dat de bijdrage van MaaS aan de duurzame mobiliteitstransitie wordt overschat of vergeten. Denkend aan de alarmerende bevindingen in het meest recent uitgebrachte IPCC rapport, is het cruciaal dit risico te minimaliseren. Beleidsmakers zullen dus kritischer moeten kijken naar de rol van duurzaamheid in hun MaaS-framing. Dit kunnen zij doen door ten eerste specifieke duurzaamheidsdoelen voor MaaS te definiëren. Daarnaast is het waardevol te kijken hoe MaaS ook gelinkt kan worden aan andere transitie in Nederland en hoe deze verbindingen kunnen worden versterkt in de nabije toekomst.

Dit onderzoek is er in geslaagd een politiek beeld te schetsen van het MaaS-ecosysteem in Nederland. Het is echter belangrijk ook een aantal beperkingen te benoemen. Zo worden er geen uitspraken gedaan over de invloed van brede maatschappelijke ontwikkelingen op de politieke situatie omtrent MaaS, ondanks dat de bevindingen van dit onderzoek wel impliceren dat die er zijn, bijvoorbeeld de invloed van het kapitalistisch systeem. Daarnaast zijn de gebruikers van MaaS niet geïnccludeerd in het onderzoek, en kan er dus niets gezegd worden over hun machtsrelaties met de andere actorgroepen. Meer onderzoek is nodig om een het beeld van de macht en politiek achter het Nederlandse MaaS veld compleet te krijgen.

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# 1. Introduction

In a world of increased urbanisation and a transport network that has become more dense over the years (Kasraian, Maat, & van Wee, 2019), we are confronted with a number of traffic related challenges: air pollution, noise pollution, congestion problems and road accidents (Werland, 2020). These environmental and urban problems are most present in cities due to their functionality as transport hubs: cities are the places where people start or end their travel, and thus, where these negative externalities of urban mobility have the most impact (Torrise et al., 2020). In the Netherlands, the CO<sub>2</sub> emissions from traffic covered 19% of all emissions in 2020, and about half of it originates from private cars. This is more than for example the 16% caused by agriculture (CBS, 2021). Because of the Covid pandemic, there was a strong decrease in car-use last year, which resulted in a lower percentage compared to 2019. This effect shows the significant role of cars on the air quality. This decreased car-use also resulted in a 20% lower nitrogen deposition and a 10 till 15% lower deposition of particulate matter in 2020 compared to 2019 (RIVM, 2021). Urban mobility is therefore a threat for the local air quality, and a serious contributor to climate change in the western world (Werland, 2020).

These problems have led to a growing pressure on cities to make the transition towards sustainable urban mobility. Sustainable urban mobility is a broad term that covers all initiatives focused on reducing negative externalities resulting from transport on the environment, such as decreasing private car-use, electric mobility, and increased use of public transport, and that is governed by a certain urban territory, such as a city (Torrise et al., 2020). In several Dutch cities, such as Rotterdam (Loorbach et al., 2021), Amsterdam (Hirschorn et al., 2020), and Utrecht (Rudolph et al., 2015), sustainable urban mobility is a serious topic on the policy and governance agenda. In the Netherlands, mobility policy is guided by the perspective of transition governance, an approach developed together with Dutch scientists that focuses on governing long-term societal changes (Loorbach, 2010). The government officially applied transition governance for the first time in the Fourth Dutch Environmental Policy plan (2001) in which the shift towards sustainable mobility is mentioned as a separate transition. From then, sustainable mobility has been monitored and studied in the Netherlands by looking into more specific mobility topics, like the use of different fuels for mobility (Farla et al., 2010), the change of car-based mobility to other forms of mobility (Kemp et al., 2011.) and public transport (Hirschorn et al., 2019). Despite all these efforts, private car-use has still a central position in the Netherlands (Loorbach et al., 2021). From 2006 till 2016 car-ownership has increased from 494 to 530 cars per thousand inhabitants (Kampert et al., 2017). This contradiction can be explained from the challenge that comes along with governing sustainable urban mobility: Governing sustainable urban mobility can be seen as the governance of a socio-technical system. A socio-technical system is a system in which technology fulfils a socio-technical function that also involves human agency, and social and organisational structures (Canitez, 2019). Increasing the sustainability of socio-technical systems is a major challenge as it requires system innovation and changes on the large-scale (Smith & Hensher, 2020).

Socio-technical systems are mostly studied by the research field of sustainability transitions. This study field sees these socio-technical systems, also called socio-technical regimes, as the locations where disruptive change, necessary for a transition, takes place. Sustainability transitions (from now: transitions) are described as “the process of change from one system state to another via a period of nonlinear disruptive change” (Loorbach, Frantzeskaki, & Avelino, 2017, p. 605). Sustainable urban mobility can be seen as such a transition as it complies with the three main characteristics of transitions: it faces a major challenge regarding sustainability, in case of mobility this is climate change and local air pollution (1). Second, a transition goes together with shifts in consumption and production patterns, that will transform the way societal functions are being operated in a system. In the sustainable urban mobility transition, these shifts are for example the use of electric cars instead of a conventional car, or increased use of public transport (2). Finally, the transformation to sustainable urban mobility interacts with different innovation levels in society, in transition studies also described as niche, regime and landscape level (3) (Farla et al., 2010; Smith & Hensher, 2020). These three levels together describe the environment in which transitions in society take place. The landscape comprises deep structural trends and the wider external factors. The niche, on the other hand, are the spaces where radical innovations occur and are being developed. The novelties in niches are a reaction on the problems related to the existing, stable regime, embedded in the broader context of the landscape (Geels, 2002). An

intervention on niche-level that has become more popular over the years and that is addressing the problems of the current car-dominated mobility regime in Dutch cities is ‘Mobility as a Service’ (MaaS) (Hirschorn et al., 2019; Pangbourne et al., 2020).

## 1.1 MaaS: a niche in the sustainable urban mobility transition

### 1.1.1 What is MaaS

MaaS is a user-centric approach on mobility, that offers an on-demand service of mobility via a digital platform, and incorporates all transport modes. It brings planning, booking and paying for mobility together by providing one digital platform (app or website), that tailors the mobility experience for a specific individual user (Arias-Molinares & Garcia-Palomares, 2019). MaaS is often seen as an intervention that is able to provide a mobility service of higher quality and with more efficiency than the current transport modes, as it uses end-user, logistic and transport data to provide an optimal mobility service (Utriainen & Pöllänen, 2018). It is seen as more sustainable, as it moves away from the idea of owning car, and promotes the shared modes of transport, such as car-sharing, ride-sharing, and bike-sharing (Utriainen & Pöllänen, 2018). The sharing economy could lead to less use of resources and in case of the transport sector, also to more efficient use of space in cities, since less parking space is required (Shaheen, 2016).

In 2018, the Dutch ministry of Infrastructure and Water management (I&W) initiated a national MaaS programme to experiment with MaaS in practice (Ministry of I&W, 2021). According to I&W MaaS is “the provision of multimodal and demand-managed mobility services, where tailored possibilities for traveling are offered to users via a digital platform with real-time information” (adapted from Harms et al., 2018, p. 7). I&W uses the integration levels of Sochor et al. (2017) to describe what they understand as MaaS. Sochor et al. (2017) developed a typology to categorize different MaaS-pilots. Based on the level of integration of information, services and transport modes, a pilot is categorized from level 0 to 4 (see figure 1). The Dutch ministry proposes level 2 as minimum level for MaaS in the Netherlands (Harms et al., 2018). With MaaS, the Dutch government is hoping to improve the mobility system in the Netherlands and to cope with the increasing pressure on infrastructure (Ministry of I&W, n.d.).



Figure 1: Typology of MaaS, including levels (left) and examples (right) (Sochor et al., 2017, p 10)

### 1.1.2 Literature about MaaS

Despite the great potential of MaaS for the sustainable urban mobility transition, mentioned by different researchers and policy-makers (Loorbach et al., 2017; Smith & Hensher, 2020; Utriainen & Pöllänen 2018), research about the effectiveness, satisfaction and how it works in practice is limited (Arias-Molinares & Garcia-Palomares, 2020; Sochor et al., 2018; Smith, Sochor & Karlsson, 2019) or lacks proof. Utriainen & Pöllänen (2018) point out that current results from MaaS-pilots show potential to increase the use of sustainable transport modes, but scientific insights about the effects for sustainability is lacking. Also, there is a high uncertainty about the actual potential of MaaS to stimulate users to engage in new travel habits, such as giving up a private car (Audouin & Finger., 2019). Finally, Pangbourne et al. (2018) state that the rhetoric on MaaS, focusing on the promise of freedom is too optimistic. They argue that problems that are addressed by MaaS, such as traffic congestion and pollution, are large-scale problems and will not be solved by MaaS on its own. The rhetoric of MaaS fails to acknowledge this complexity of solving environmental problems. Thus, the value

of the implementation of MaaS for sustainability can be questioned. This leads to the first proposition of this thesis.

*There is a need to develop a critical understanding of the value of MaaS as part of the sustainability transition to sustainable urban mobility (1).*

Second, it is unclear what the stakeholders' roles and responsibilities of MaaS are or how power relations between actors play out (Curtis et al., 2019; Utriainen & Pöllänen, 2018). Referred to as the 'MaaS-ecosystem', MaaS stakeholders are active in a dynamic environment and cover a wide spectrum of public and private organisations. These organisations can have the role of mobility provider, operator or both (Arias-Molinares & Garcia-Palomares, 2020). Smith & Hensher (2020) state that the role of the government is acknowledged as having the role of enabler - making it possible for actors to participate in MaaS by providing a regulatory framework -, but Pangbourne et al. (2018) mention that public authorities can take more roles than only enabler. The public-private partnerships that come along with MaaS make this overview even more complicated and can set difficulties for the collaboration between actors (Smith et al., 2019). The distribution of roles is a result of a process of ongoing negotiation, based on power, struggle and competing interests between actors. Actors can *perform* a role by having certain responsibilities, or they can *use* a role in order to get access to resources (Avelino & Wittmayer, 2016). Understanding the power-relationships between actors can therefore help us to understand in what role actors put themselves, or in what role they are placed by others, as a result of the powerplay between them. This leads to the second proposition:

*There is a need to analyse the power relationships between the stakeholders of the MaaS-ecosystem, in order to get a deeper understanding of how roles and responsibilities are shaped by these power relations (2).*

## 1.2 Critique on transition literature

Looking at MaaS as a niche in the sustainable urban mobility transition, transition theory can help to develop insights in the different processes and pitfalls of the governance process of MaaS (Farla et al., 2010; Loorbach et al., 2017; Smith & Hensher, 2020), and therefore contribute to a broader understanding of the role of MaaS within the sustainable urban mobility transition (proposition 1). Moreover, it can provide analytical lenses to look at how actors on different levels cope with societal problems or innovations (Loorbach, 2010), and therefore help to understand the roles of these actors (proposition 2). However, the propositions require more than that: they ask for a critical political understanding of a transition. From the political and critical research sides, a frequently heard argument is that the traditional view on transitions focuses too much on technical innovations and the role of science, neglecting the important role of politics, different interests, and power in niche-regime dynamics. Although the broader political developments might be considered as a contextual factor (Geels, 2011), the micro-politics – crucial to understand transition politics – are overlooked (Avelino, 2017).

There has been an increasing number of studies focusing on transition politics, which investigates this 'micro-political' side of transitions (Audet, 2016; Avelino & Wittmayer, 2016; Avelino, 2017; Avelino et al., 2016; Hess, 2014; Meadowcroft, 2009; Meadowcroft, 2011; Smith & Stirling, 2010;). These studies offer a critical viewpoint on transition management by arguing that "sustainability transitions are inherently political" due to the different interests that are involved and the political decisions that need to be made (Meadowcroft, 2011, p. 71). Inextricably linked to socio-technical developments are powerplays between dominant incumbent actors and upcoming actors trying to push forward new ideas and innovations (Avelino, 2017). Following this argumentation it means that not only the influence of techniques and innovations on transitions should be the research object, but also issues like power, discourse, and changing roles and relationships. There is a growing need to investigate how transition arena's function as spaces that reproduce existing or bring forward new power structures. Micro-politics are not about formal power structures, nor geo-political processes, but consider the politics on micro-level. It is on this level that actor roles are being framed (Avelino & Wittmayer, 2016), paradigms are applied strategically and therefore reproduced (Pangbourne et al., 2018), and that novel and daily practices influence power struggles (Hoffman & Loeber, 2016). Studying these kind of topics offers opportunities to critically evaluate the current power relationships and to also offer alternatives in a process of

social change. With the growing discourse on sustainability in politics and governance it can bring more nuance to the political dimensions of sustainability in transitions (Avelino, 2017; Smith & Stirling, 2010).

A second critique on the traditional view on transitions is the argument that it only implies a vertical form of power: the traditional view assumes that the regime has power over the niches, by being more stable and accepted, and that the landscape is pressuring the regime and niche level (Geels, 2002). This top-down vision does not provide any nuance on what kind of power is executed, where power is located exactly, and how it influences the niche-regime dynamics. Moreover, it overlooks the fact that power can be executed in different ways, for example by the use of paradigm commitments, state organization or policy programmes (Swilling et al., 2015), the use of discursive frames (Audet, 2016), or due to different power dynamics (Avelino, 2017; Swilling et al., 2015). Finally, the simplified top-down vision ignores the possibility of horizontal power relations existing between niches or within a niche, and it fails to address the internal struggles within a regime that could influence niche-regime dynamics.

Earlier research has already made some suggestions to capture this more complex view on power in transitions. Pel (2015), for example, states that transformative forces in transitions not come from a 'bilateral struggle but rather pervades networks' (Pel, 2015, p. 688). Chilvers & Longurst (2016) suggest to look at transitions as co-produced, emergent, and relational developmental areas. By highlighting the role of participation in transitions, they criticise the conventional view of seeing the niche and regime as colliding power forces (Chilvers & Longurst, 2016). These studies suggest alternative niche-regime interactions than the traditional view on transitions focused on a vertical power relationship. Moving away from the conventional view on power in traditions is thus important to uncover alternative dynamics for societal change and sustainability transformations. It enables researchers to look beyond the notion that change starts only in spaces of innovation and that it only comes forward from a conflict between niche and regime (Meadowcroft, 2009; Pel, 2015; Avelino et al., 2016). To conclude, there is a need to study transitions based on a broader, more complex understanding of power, than the one-sided understanding of power provided by the traditional socio-technical perspective (Avelino et al., 2016; Avelino, 2017). Using a more complex understanding could contribute to an alternative perspective on niche-regime interactions and transitions in general, that is able to capture the complexity of our political reality.

In the research field of MaaS, studies using this more complex understanding of power are extremely limited. MaaS has been studied with the use of transition theory before (Audouin & Finger, 2019; Hirschhorn et al., 2019; Smith & Hensher, 2020), but mainly by taking a traditional socio-technical focus. Research on MaaS as a socio-political system is rare, despite the critique on the traditional transition theory in literature. The research of Pangbourne et al. (2020), in which the rhetoric of MaaS is the study object, is an exception. They argue for more studies focusing on power imbalances within MaaS and the framing of MaaS. MaaS brings in new roles in the mobility field, such as a MaaS-provider, and comes along with new challenges for governance compared to the governance of mobility in the incumbent mobility regime (Audouin & Finger, 2019; Smith & Hensher, 2020). Based on the growing body of literature that studied transition politics, it can be expected that these new aspects related to MaaS come along with new or different power relations in the mobility sector. MaaS offers therefore an interesting case to see how micro-politics have an impact on the niche-regime interaction.

To contribute to the knowledge gap and the above mentioned critiques on the traditional transition perspective, this thesis takes transition politics as starting point, by focusing on the power relationships between the actors in the MaaS-ecosystem. The socio-political perspective allows the researcher to explore how MaaS and/or the incumbent mobility regime are reproducing, reshaping, or bringing forward new power relations. Politics are understood not just as the behaviour of the government, but as the behaviour of all actors active in the political arena (Meadowcroft, 2011, p. 71). This means also more indirect forms of politics are considered, such as the application of discursive frames. Frames are used by institutions to shape what is possible and can work as enabling or restricting resources in a transition (Meadowcroft, 2011). Understanding the impact of frames on policy and practices is therefore key to understand niche-regime interaction and transition politics.

### 1.3 Research objectives

By focusing on the case of the Netherlands, a country that has a lot of experience with applying transition governance (Bosman et al., 2014) and in which MaaS is already well-accepted by policymakers (Harms et al., 2018), this thesis contributes to empirical research on transition politics. Having the need in mind for a critical approach to study the sustainable urban mobility transition, and the need for studying power in transition on micro-level, based on a more complex understanding of power, this research is valuable for different reasons. Not only does it contribute to the knowledge gap of studying MaaS as a socio-political system, but it also provides a complex understanding of the power exercised in the MaaS-ecosystem, based on analysing the specific case of the Netherlands. The case study design will be guided by different theoretical concepts from transition politics on discourse (Audet, 2016), actors (Avelino & Wittmayer, 2016) and power (Avelino, 2017). Since MaaS in the Netherlands has not yet been studied with the help of these theories, the results of this thesis can bring forward new insights on the political dimensions of MaaS in the Netherlands, as well as niche-regime interactions in the sustainable urban mobility transition in general.

The outcome of this research aims at creating a political understanding of the niche-regime interaction between MaaS and the mobility regime in the Netherlands, which contributes to an understanding on how this interaction shapes the transition to sustainable urban mobility. By taking a socio-political perspective, this thesis aims to reduce the knowledge gap about the transition politics of MaaS and will therefore contribute to a deeper theoretical understanding of the role of politics in sustainability transitions. The insights will also contribute to a more practical understanding of the politics of MaaS, which can be used by policy-makers to reflect on their current transition governance on sustainable urban mobility.

### 1.4 Research questions

Based on the objectives, the main research question of this thesis is as follow:

*What is the role of power in shaping the relation between MaaS and the current mobility regime in the Netherlands?*

To answer the main question, two sub-questions were developed:

*What is the discursive framing of MaaS by the Dutch government?*

To answer this first sub research question, a discursive analysis of the Dutch MaaS niche will be conducted. Within this discursive analysis the focus will be on discursive frames. Audet (2016, p.3) describes discursive frames as “shared coherent sets of meanings and interpretations of reality”. In a discursive analysis, language is seen as a resource and therefore as something that is used by actors to execute their power (Taylor, 2013). This research question is important to get an understanding of how MaaS is positioned by the Dutch government as the initiator of the niche, and will help to look critically at the effects of frames on the niche-regime interaction.

*How is power exercised by the actors of the MaaS-ecosystem in the MaaS-pilot of Eindhoven and the MaaS-pilot of the Amsterdam Zuidas?*

To analyse power in practice and to put the focus specifically on power relationships, this second question is formulated. The POver-In-Transition-framework (POINT framework), developed by Avelino (2017), will be used to understand the different aspects of power exercise. According to her, exercising power is about the mobilization of resources, different types of power relationships, and (dis)empowerment. These concepts are elucidated in the next chapter that composes the theoretical framework of this thesis. Guiding questions in getting an answer on this research question are for example: How do actors mobilize resources? what resources do they mobilize? what kind of power do they use? (how) are they (dis)empowered by others? By addressing so many topics, this question might look very broad, however, this broad approach is required in order to cover the complexity of the concept of power. Avelino (2017) describes power as something that is exercised by actors at different points in time and in different roles. Rather than viewing power as something static, it is something multi-dimensional and power relationships might be changing continuously. This implies that the exercise of power is not a matter of analysing the mobilization of resources independently from the type of power or power relationship, but that it needs to be analysed in an integrative way.

## 1.5 Thesis outline

In order to present a structured answer on the main question, this thesis is structured as follows: In chapter 2 an explanation of the theoretical framework is provided. First, the traditional theoretical lens on transitions is explained. Second, the socio-political lens central in this thesis is explained by looking at how to study power in transitions. In chapter 3, the methodology is elucidated by describing respectively the general research design, the data collection and data analysis processes. This thesis consists of two results chapters. Chapter 4 dives into the discursive framing of MaaS by the Dutch government, and chapter 5 analyses the power relations in the MaaS-ecosystem by focusing on two practical cases in Amsterdam Zuid and Eindhoven. By reflecting on the results in chapter 6, a critical perspective on MaaS and the sustainable urban mobility transition is provided. This all leads to the conclusion in chapter 7, that is finalized with some recommendations for policy.

## 2. Theoretical framework

In this chapter the theories used for studying power in transitions will be explained. However, first it is necessary to dive a bit deeper into the traditional view on sustainability transitions, in order to understand the starting point of transition politics.

### 2.1 The traditional view on sustainability transitions

#### 2.1.1 The Multi-level Perspective

The traditional view on transitions focuses on the existence of socio-technical regimes within a broader landscape level. The idea of a socio-technical regime was mainly developed by Rip, Kemp & Schot (1998) and was developed further by Geels (2002) into the Multi-level perspective (MLP) (Loorbach et al., 2017). The MLP provides a multi-dimensional perspective for structural change and looks not at an innovation or technique as something existing independently, but as something that interacts with different levels of society. The MLP allows to look beyond a technological development, and also acknowledges that before a technical substitution can happen, disruptive change in other sectors, such as the economic or cultural sector, is needed. This disruptive change takes place in socio-technical regimes, which are the set of rules by which a socio-technical system operates and activities of social groups are reproduced (Geels, 2011). Within a regime there exist certain ideas, practices and technologies which are embedded in institutional structures (Markard, Raven, & Truffer, 2012). Through process optimization and incremental innovation a certain path-dependency is created by the socio-technical regimes. Over time, these path-dependencies can create lock-in situations. These lock-in situations often come along with problems in the regime that are very hard to solve (Loorbach et al., 2017).

Regimes are challenged by niches. Niches are the emergence of new technologies that are able to develop without the pressure of the regime and are therefore also referred to as ‘protected spaces’ (Geels, 2011). Niches are often being developed as an answer on the problems of the regime resulting from the path-dependencies (Geels, 2002). In niches there are activities happening of experimenting and social learning. At a certain moment they will gain enough momentum to destabilize the regime, which causes stress in the regime that can lead to more radical change, instead of the incremental change due to path dependencies (Loorbach et al., 2017; Markard et al., 2012). This process is visualised in the figure 2. Socio-technical regimes are located in a broader context of the socio-technical landscape, which contains the broader societal values, political ideologies and macro-economic patterns. The landscape level is external in a sense that it puts pressure on the niche-regime dynamics and it is not easy to change on the short run (Geels, 2011).

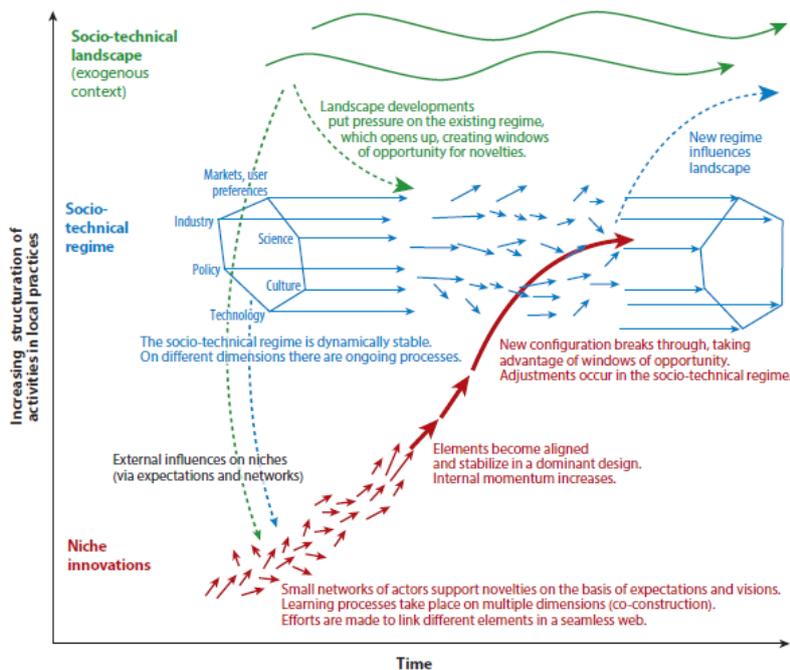


Figure 2: The Multi-level perspective (Loorbach et al., 2017).

## 2.1.2 Applying the traditional view on MaaS

There are several reasons why you can see MaaS as a niche compared to the dominant configuration about mobility: First, the concept of MaaS challenges policy-makers to look differently at transport. The traditional way of transport planning puts traffic in the centre, focusing on infrastructure and how this can improve the traffic flow and increase the transport capacity (Werland, 2020). Compared to this mobility regime, MaaS offers a 'new paradigm' of being user-centric. Instead of making policy for specific modes of transport, transport policy should be based on the user-experience (Arias-Molinares & Garcia-Palomares, 2020; Utraiainen & Pöllänen, 2018). MaaS is also presented as an alternative to the incumbent mode of transport in the regime: the private car. MaaS focuses on simplifying the accessibility of other modes of transport, and stimulates the *use* of a car, instead of the *possession* of a car (Harms et al., 2018; Butler et al., 2021; Audouin & Finger, 2019). To summarize, MaaS challenges our established daily practices around travelling and the way we think about mobility and transport, which means it has the potential to lead to disruptive change of the regime, one of the main characteristics of a niche (Loorbach et al., 2017). Another aspect that shows that MaaS is active on the niche-level is the room for experimenting and learning. At the moment European countries and cities are experimenting with MaaS by rolling out pilots, among them the Netherlands (I&W, 2019; MaaS4EU, n.d.). Those pilots provide a protective space necessary for sustainability innovations to develop and enrol support and to destabilise the regime (Smith & Stirling, 2010).

## 2.1.3 Moving from a socio-technical perspective to a socio-political perspective

To study niche-regime dynamics from a socio-political perspective, a more complex conception is needed than the above described traditional view. A socio-political perspective puts power and agency in the centre of the research, giving a more nuanced understanding to the role of actors and power in a transition (Avelino et al., 2016). In this chapter three theories to study power in transition are presented: 1. The more descriptive 'transition as discourse' (Audet, 2016), based on the popular critical approach of Foucault's discourse analysis (Foucault, 1972). 2. The POINT framework by Avelino (2017), which offers a more deep understanding of power in transitions. 3. The MaP framework from Avelino & Wittmayer (2016) that enables the researcher to cope with the many actors involved in the MaaS-ecosystem. All theories have been developed by taking the general idea of the MLP as starting point, and are therefore useful for this research that uses the MLP as a lens to look at reality.

## 2.2 Transition as discourse

### 2.2.1 Discursive framing

Using discourse analysis of Foucault (1972), Audet (2016) analysed global environmental policy documents in which transitions were the main topic. A discourse is seen by Foucault as the reflection of dominant and repressing realities that are existing in the power relations of a society (Schneck, 1987). Audet (2016) builds upon this theoretical foundation by applying the concept of 'discursive frames', which is something slightly different. He states that, however a discursive frame might end up in a dominant and persistence discourse that is determining a certain reality, a discursive frame itself can be seen as a resource. Frames are used by actors in a process in which they manipulate and integrate societal structures and in the end help to converge conflicting claims into a stable pattern that structures social reality (Audet, 2016).

### 2.2.2 The radical transition frame and the technocratic transition frame

Audet (2016) presents two discursive frames: the radical transition frame and the technocratic transition frame (figure 3).

The radical transition frame is a discursive space in which transitions are seen as radical and complex bottom-up processes, where 'normal' people, civil society actors and start-ups are the main drivers of the transition process. These local actors are the real pushers of innovations, and should be empowered by the government to do projects on local level focused on transformation. In the end this is how environmental value for society can be achieved. Social well-being is the central goal, and it is believed that this will make society also healthier from an economic point of view. Audet (2016) mentions that claims fitting in this frame are often activist, focusing on equality and the environment, such as calling for a tax on activities that are harming nature.

While the radical transition frame is arguing for transitions as bottom-up processes, the technocratic transition frame communicates about transitions as processes steered by top-down governance. Investing in key sectors that have the right knowledge and resources, together with economic measures and incentives monitored by the state, are activities necessary to overcome lock-in situations in which some business have caught up themselves. The state therefore is seen as the most important actor for pushing a transition through. By defining the policy framework and ‘setting the rules of the game’ they are the real driver of the transition. Rather than viewing civil society as frontrunners, which is the case in the radical transition frame, civil society is seen as a group that needs to be protected from the side effects of a transition, such as job losses or high costs for installing technical innovations. The state should apply concepts such as green growth, decarbonisation, and internalising prices, in order to protect civil society. Another difference is the role of economic growth, which is seen as the requirement for creating social benefits, instead of the result of social benefits.

Both frames acknowledge the importance of development, human rights and the state, but take different standpoints on what their role should be in a transition, stemming from the different viewpoints on bottom-up versus top-down governance. Moreover, complexity is something discussed by both frames, but again in a different way: The radical transition frame views complexity as an inherent part of transition. Transitions can never be controlled, only steered in the right direction. The technocratic transition frame on the other hand, views complexity as something that is resulting from the need for greening and decarbonising a sector. It is assumed here that complexity is a consequence of technocratic problems, and can thus be solved by technocratic solutions, such as working with indicators and protocols.

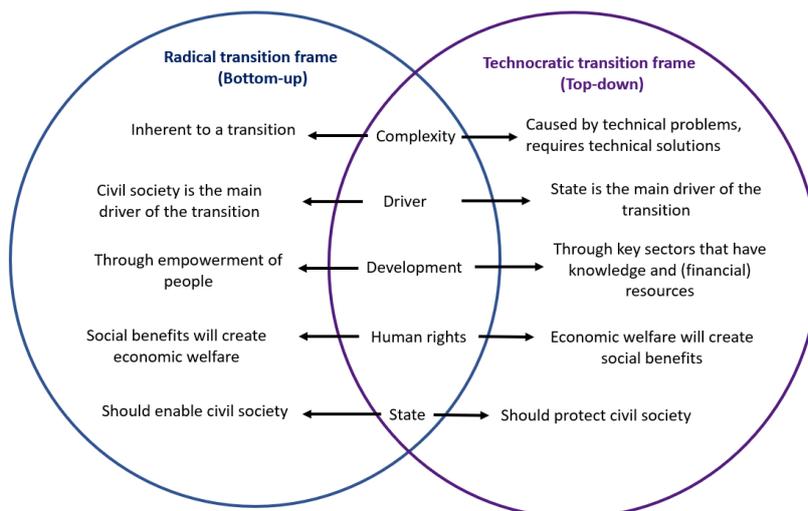


Figure 3: An overview radical transition frame and technocratic transition frame (selfmade, adapted from Audet, 2016)

The ‘transition as discourse’ theory offers a guideline to find different discursive frame elements in the Dutch description of MaaS by the state. It is able to uncover what actors are framed as powerful and in what context. It therefore enables the researcher to find how discursive frames are used by the Dutch government to shape the MaaS niche. This will contribute to a more nuanced understanding of how the Dutch government applies discursive frames to exercise power. In the light of niche-regime interaction, ‘transition as discourse’ contributes to see how discursive frames might reproduce or challenges incumbent power relations.

## 2.3 The Power in transition framework

### 2.3.1 The POINT framework & transition politics

Looking at power from the perspective of discursive frames is one way to analyse power. Avelino (2017) takes a more complex approach, by thinking beyond the frames. Frames are resources, and although she acknowledges that different types of power can result from using different types of resources, such as discursive frames, she prefers to see power as something that is exercised (by actors) instead of something that is possessed (resources). Moreover, she critiques the Foucauldian view. According to this view power is non-

subjective, and not executed *by* actors, but *through* actors and practices by institutions and structures (Foucault, 1972). Avelino (2017) argues that this is rather *powerlessness* than *power*: If actors are not free, but determined by institutions or other actors in exercising power, they are not powerful at all. The Foucauldian assumption that actors can only act within the limits of the structure, because the structure is the power, closes the door for transition thinking. Although transition theory also assumes that structures (regimes) can be very powerful, they can be challenged and reshaped (Loorbach et al., 2017). This implies that power is not only exercised by structures, but can also have other origins outside the structure. While Foucault and the MLP are conflicting with each other on this point, the POINT framework does align with the MLP. Both the MLP and the POINT framework assume that power can also come from outside a certain structure and that it can be exercised on different levels and by different actors (Avelino & Wittmayer, 2016; Loorbach et al., 2017). This makes the POINT framework very suitable for studying transition politics.

With her POINT framework Avelino (2017) follows the MLP, while at the same time she responds to the critiques on the traditional view on transitions. She provides a framework for analysing horizontal power relationships and offers therefore a strategy to cope with one of the limitations of the MLP, that views power as something only existing in vertical relationships. Moreover, these horizontal power relationships are described by different power dynamics, offering a method to study the micro-politics in a transition. With the many different actors that are involved in MaaS, there are many different power relations possible, and thus many different power dynamics. The POINT framework could therefore help to create a more clarifying overview of these different power dynamics in MaaS and give insight into how power relations might be reproduced or challenged within the niche or on niche-regime level.

### 2.3.2 Power relationships in sustainability transitions

Avelino (2017) states that different actors (e.g. actor A and B) can have a certain social relationship which can reflect a certain power relationship. Traditionally, power has been studied as A having 'power over' B, or 'more/less power than' B. In the first case it means that A can led B act in a certain way. In the second case it means that A has more or less of a certain kind of power than B to achieve something. As long as A and B have similar goals, A and B can cooperate, but when their goals are mutually exclusive 'more/less power to' will lead to competition between A and B. Avelino (2017) adds on these kinds of relationships, by adding a third power relation: A has a 'different power to' achieve things than B. In this case A and B can work together when these different powers support each other, but it can also lead to antagonism, in case the power of one actor restricts the other actor. An overview is given in figure 4, where three different kind of power relationships lead to nine types of power dynamics that can result in the empowerment or disempowerment of either A or B. (Dis)Empowerment is understood as "the process through which actors gain the (in)capacity to mobilize resources and institutions to achieve a goal" (Avelino, 2017, p. 512). Avelino (2017) discusses the theoretical background of this concept in great detail, using insights from social psychology. Since these thesis is not using a psychological approach, understanding the background of (dis)empowerment is out of scope. The concept will therefore not be discussed any further.

The power dynamics (see figure 4) can (co-)exist between the levels of the MLP, but also within a level. It follows that there is great complexity, caused by the high amount of actors in a socio-political system.

Type of power relations	Types of power dynamics		
<i>Power over</i>	A depends on B but B also depends on A => A and B have power over each other <b>Mutual dependence</b>	A depends on B but B does not depend on A => B has power over A <b>One sided dependence</b>	A and B do not depend on each other => A and B have no power over each other <b>Independence</b>
<i>More/less power to</i>	A exercises more power than B, but A and B have similar, collective goals <b>Cooperation</b>	A exercises more power than B, while A and B have mutually exclusive goals => <b>Competition</b>	A exercises more power than B, A and B have independent coexisting goals <b>Co existence</b>
<i>Different power to</i>	A's and B's different power exercises enable and support one another <b>Synergy</b>	A's and B's different power exercises restrict, resist or disrupt one another <b>Antagonism</b>	A's and B's different power exercises do not (significantly) affect one another <b>Neutrality</b>

Figure 4: Power relations resulting in nine power dynamics (Avelino, 2017)

### 2.3.3 Typology of power for sustainability transitions

Next to different types of power relationships resulting in different types of power dynamics, Avelino (2017) also talks about different kind of qualitative forms of power. She criticises the general assumption that, when thinking about change versus stability, power is something that can either push change or defend it. However, she argues for a more nuanced view on this: defending or pushing change is not simply the same kind of power, but it is qualitatively different from each other.

Avelino (2017) proposes three qualitative power types: reinforcing power, innovative power, and transformative power (table 1). She calls innovative power “an act of power in and of itself” (p. 509). It is the most purest and direct form of power, as it makes actors directly less dependent on existing resources and therefore on the structures in which these existing resources are the standard. Resources can be monetary, ideational, mental, artefactual etc. The transformation described in transformative power is about acts of questioning, challenging and altering the existing status quo. Transformative power might not be enough to put a whole transition through, and reinforcing power might be needed to strengthen the changes started by transformative power. Reinforcing power is the power exercised by actors who reproduce and reinforce existing institutions and structures. Reinforcing power is focused towards the institutions and structures that are already existing, rather than creating new ones.

Table 1: Three forms of qualitative power: Reinforcing, innovative, and Transformative (Adapted from Avelino, 2017, p. 508, 509).

Power typology	Definition
Reinforcing power	the capacity of actors to reinforce and reproduce existing structures and institutions
Innovative power	The capacity of actors to create new resources
Transformative power	The capacity of actors to develop new structures and institutions

Avelino has developed the POINT framework with the purpose of using it for critical analysis (Avelino, 2017). It acknowledges the wide range of actors that are taking part in transitions, and at the same time it allows researchers to see these actors from a dynamic perspective: they can be active on different levels of the MLP, exercising different types of power and being involved in different kind of power relationships. Avelino therefore offers a very complex, yet needed, framework to study power in transitions, that is able to analyse power in MaaS from the complex understanding that is currently lacking.

## 2.4 Combining the POINT framework with discursive frames

Theoretically reinforcing, innovative and transformative power can be exercised on all levels of the MLP, and the same counts for the radical transition frame and the technocratic transition frame. Seeing discursive frames as a resource (Audet, 2016) and at the same time seeing resources as an important part of the power typologies described by Avelino (2017), there is potential to link these theories to each other, providing an even more nuanced view on the use of frames as an act of exercising power. Reinforcing power is more often related to the regime (Avelino, 2017), while the technocratic transition frame presents a view that is often supported by incumbent institutions. Combining these statements lead to the expectation that the technocratic transition frame will be more often used as a resource to express reinforcing power than to express innovative or transformative power. On the other hand, the important role of empowering actors from bottom-up to generate innovation that is stressed by the radical transition frame, fits with the idea that innovative power is expressed by creating new resources. This might however not be so black and white in practice, which makes it something interesting to explore.

## 2.5 The Multi-actor Perspective

Since this research takes the MaaS-ecosystem in the Netherlands as its scope of research for studying power, it is not only important to know what the relationship can be between actor A and B, but also what role actor A and B could take. Knowing this, it becomes easier to understand their position in the MaaS-ecosystem. Avelino & Wittmayer (2016) developed the Multi-actor Perspective (MaP) to conceptualise the different roles and their

powerplay in a transition. The MaP distinguishes four sectors in which individual actors and organisations are active: state, community, market and third sector (see figure 5). An individual actor can be active in more than one sector at the same time. A policy-maker is for example part of the state-sector, but when he takes the bus to visit his friends he is also a public-transport user, part of the community. The third sector overlaps with all other sectors and represents a broad range of organisations, that function as intermediary organisations between profit and non-profit, and formal and informal. It comprises for example civil-society organisations (that are more formal than the informal community groups) and non-profit organisations.

The MaP acknowledges that there can be different power relationships between sectors and within sectors and that it is not just a matter of vertical power relationships between two sectors. It is therefore able to cope with the complexity of the POINT framework. Moreover, just like the different types of power in the POINT framework, it acknowledges that a sector is not limited to one certain level of the MLP, but rather that every sector can reflect both regime and niche elements. Another interesting aspect about the MaP is that it distinguishes between sectors as actors (e.g. the market as actor), and individual actors within a sector (e.g. a CEO of a business). Although both can be seen as an entity holding agency, Avelino and Wittmayer (2016) emphasize that these sectors as actors also can be seen as discursive fields and institutional contexts (e.g. the discursive field of the market). This shines an interesting light on the earlier discussed ‘transition as discourse’ (Audet, 2016), as it might be possible that the discursive frames could not only be seen as a resource, but maybe also as a discursive field representing a certain sector.

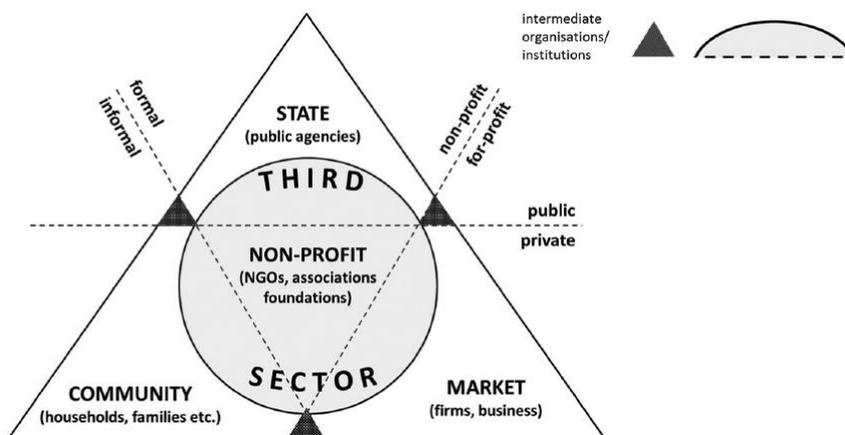


Figure 5: The MaP: showing the level of sectors in which individual actors and organisations are also taking on certain roles (Avelino & Wittmayer, 2016).

By offering a categorization of actors, the MaP offers a schematic overview of the many actors that are involved in the MaaS-ecosystem. The MaP provides the researcher to see the power relationships in the MaaS-ecosystem as dynamic, while at the same time considering the different roles and responsibilities of the actors. The MaP is therefore a valuable addition to the socio-political lens of this study.

## 2.6 Conceptual framework

In this thesis the concepts niche, regime and landscape level from the MLP are used to understand the broader context of the sustainable urban mobility transition, in which MaaS is a niche that is challenging the accepted practices and ideas on mobility. Taking a socio-political approach means looking at actors, discourses and power. Within transition theory, the theories of Audet (2016) and Avelino (2017), and Avelino & Wittmayer (2016) offer a well-thought possibility to do so. Audet offers with his ‘transition as discourse’ two discursive frames to understand the dynamics and differences within the broader discourse of transition. Using ‘transition as discourse’ helps explaining how frames as resources might be used by institutions and societal structures as important influential factors in the powerplay of MaaS. Moreover, it helps to become aware of the context in which the actors of the sustainable urban mobility transition are exercising their power. ‘Transition as discourse’ thus contributes to an understanding of how frames might reproduce or challenge existing incumbent power relations, which is crucial in understanding the niche-regime interaction of a transition. A

more complex approach to study power is the POINT framework from Avelino (2017). This framework puts the focus on actors and shows how (dis)empowerment and different power dynamics are a result from different power relationships. It offers a tool to describe the power-dynamics between the actors active on the different levels described by the MLP (Geels, 2002). To understand what kind of actors are active on these different levels, the MaP (Avelino & Wittmayer, 2016) complements to the POINT framework and provides a similar understanding of power. It is therefore a useful tool for understanding the complex field of the MaaS-ecosystem. Figure 6 and 7 together visualise the conceptual framework of this thesis. Figure 6 shows an example of how the different types of qualitative power can be exercised by a sector of the MaP, or by an individual actor or organisation within a sector of the MaP. Figure 7 illustrates how different power relations and power dynamics can play a role on niche and regime level, when combining the theories of Avelino (2017) and Avelino & Wittmayer (2016).

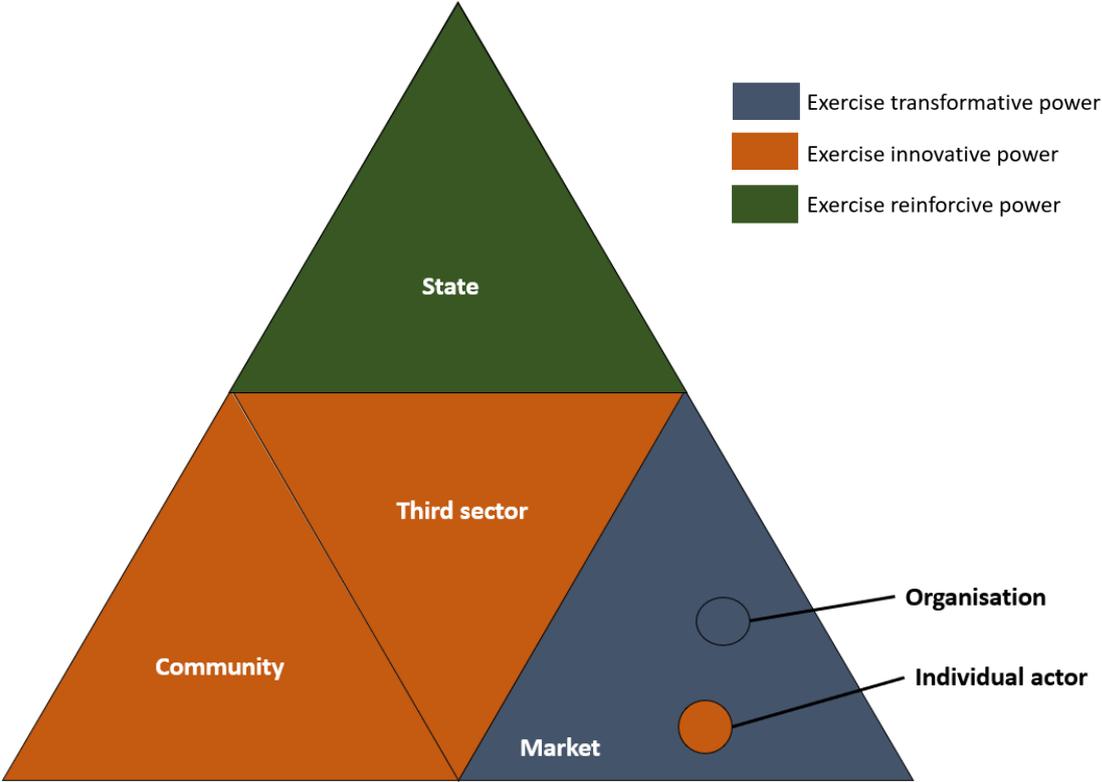


Figure 6: Different qualitative forms of power in the MaP (Avelino & Wittmayer, 2016). The colours are allocated arbitrary and do only provide an example to illustrate the theory. They do not say anything about the results of this thesis or the situation in the real world (selfmade).

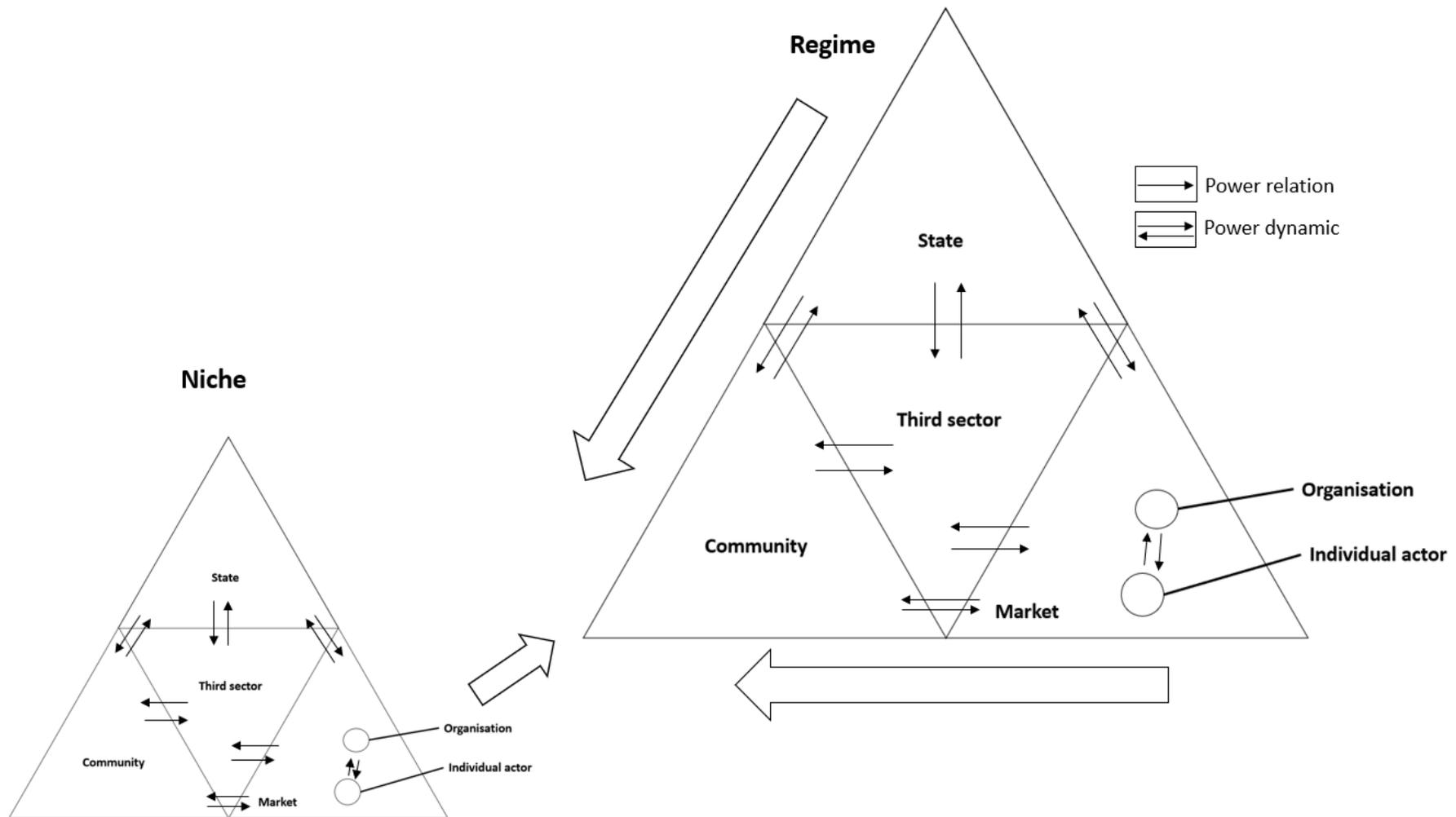


Figure 7: Conceptual framework for studying power in transitions. Power relations can exist between different sectors, actors and the niche and the regime. They result in certain power dynamics. The capacity to mobilise or to create resources will determine what kind of power an actor (group) is exercising (Avelino, 2017). Among these resources, transition frames are analysed more explicitly

## 3. Methodology

This chapter describes the scientific methods used to answer the research questions. First, an overview of the general research design is given after which the data collection process is described. The data collection section (paragraph 3.2 and 3.3) includes a description of the two MaaS-pilots that were investigated during this study, functioning as the empirical cases to study the micro-politics of MaaS. These pilot descriptions function both as a justification for why these cases were chosen, as well as background information that enables the reader to understand the results in the specific contexts. Finally, the data analysis process is described elaborately.

### 3.1 General research design

This thesis takes a critical qualitative approach by focusing on power relationships as the main study object. The research field of MaaS taking a critical approach is small (Pangbourne et al., 2020), and dominated by descriptive and normative research focusing on the role of (policy-)innovation and technology, as described in paragraph 1.2. This study does not want to look at MaaS from a conceptual perspective, but wants to take a critical in-depth look at how it works in real-life. An embedded case study design fulfils this purpose and was therefore chosen to investigate the phenomenon of the niche-regime interaction between MaaS and the mobility regime. An embedded case study design is a research design used for the empirical study of different sub-units part of the same overarching case. When describing a complex real-time case, an embedded case study adds on to the depth of the research as it relies on multiple resources for data collection (Crowe et al., 2011; Flyvbjerg, 2011; Yin, 2003). The specific case that was chosen is: MaaS in the Netherlands. Two Dutch MaaS-pilots have been investigated, functioning as the two subunits of the Dutch MaaS case. These subunits allowed the researcher to consider the specific circumstances in each of them and therefore enhancing possible insights into the case. Although, the findings from the two subcases might not be generalisable to all MaaS cases, at least it will contribute to the accumulation of knowledge and a general understanding of the field of MaaS (Flyvbjerg, 2011; Smith et al., 2019). For a more elaborate discussion on this, see chapter 6.

The research consisted of doing a discursive analysis of primary document-data and semi-structured qualitative interviews. Since the government is the main initiator of the MaaS niche in the Netherlands, state-documents were used to create a general overview of the discursive framing of this niche. How the MaaS niche interacts with the regime in the real world was investigated by interviews with stakeholders from two MaaS-pilots in the Netherlands, who are playing a key role due to the roles and responsibilities they have. The state-documents and the interviews function as complementary data sources for this research. The document analysis was crucial to develop a general understanding of the Dutch MaaS case. This contributed to an understanding of the more specific interview data in the light of the broader context of sustainable urban mobility in the Netherlands. This process of zooming-out from the specific subunits to the general Dutch MaaS case helped to develop a critical perspective on the sustainable urban mobility transition in the Netherlands. A general overview of the research design is shown in figure 8. In the next sections the specific methods are described in more detail.

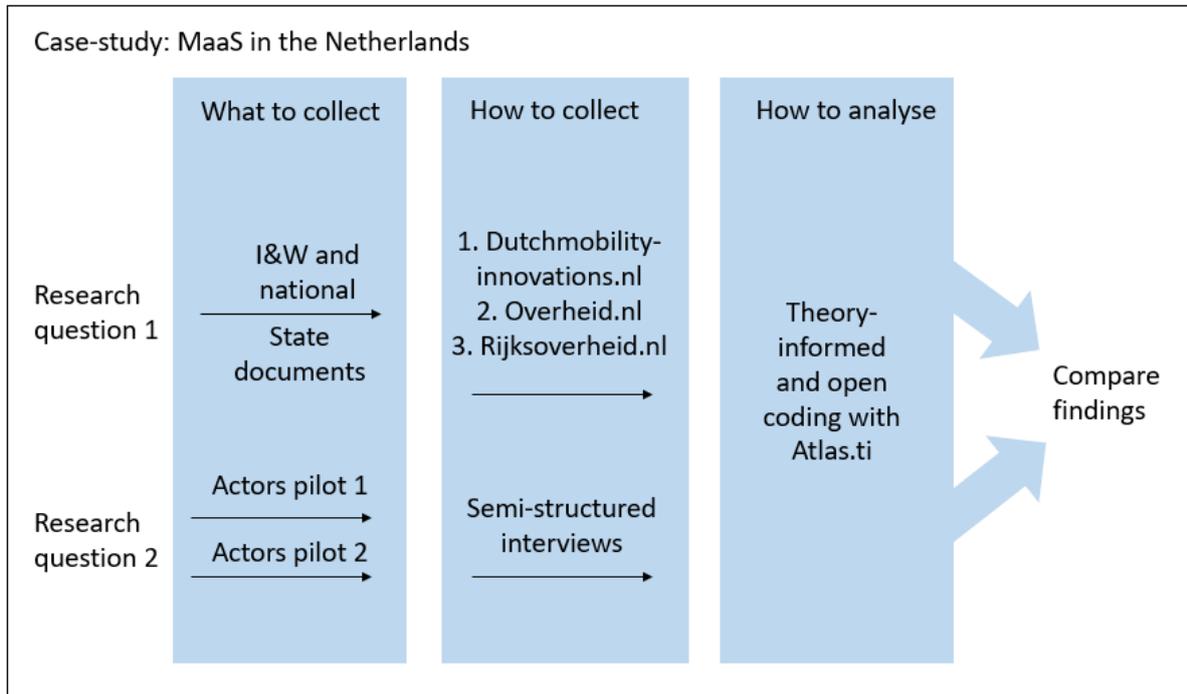


Figure 6: Overview of the research design

### 3.2 Data collection for Research Question 1

To answer the first research question a discursive analysis was done by studying policy documents as the primary data source. The reason that this specific type of textual data was included for the discursive analysis is two-fold: First, these policy documents were easily and freely accessible and therefore fitted well in the time planning available for this research. Since the discursive analysis was used to answer only one of the research questions, using this type of primary data allowed the researcher to still have time to gather and analyse data for answering the second research question. Second, by including written text only, for this specific research question, the internal validity was increased. The knowledge gap about the roles, responsibilities and the actual effects of MaaS, which is one of the reasons to conduct this study, creates difficulties for studying the MaaS niche. It creates aspects of uncertainty about how the niche looks like in practice and makes it uncertain where the MaaS niche starts and where other niches or the regime begin. This unclear boundary might be typical for transitions, since it is often the break-out of a niche into a regime that can create an unclear boundary (Geels, 2002). However, the relatively limited amount of research on MaaS and niche-regime interaction created even more uncertainty about the niche-regime boundary in this case. In order to be more sure that it was the MaaS niche that was studied as the overarching case, and not accidentally also other niches or regime-elements, only written documents were included, in which the topic of MaaS was explicitly mentioned. It created certainty that all included data was directly related to the MaaS niche, and that the discursive frames that were found in this data are applicable specifically for the Dutch MaaS case.

MaaS in the Netherlands is an initiative by I&W as part of the broader mobility policy. Therefore, only publicly available documents published by I&W or chapters specifically focused on MaaS, that are a part of bigger policy documents published by the national government, were included. In preliminary investigations the oldest document found on MaaS in the Netherlands published by the state stemmed from November 2017. Since the data collection started in January 2022, only documents between November 2017 and December 2021 were included.

To collect these documents three websites have been used as data sources: [dutchmobilityinnovations.nl](http://dutchmobilityinnovations.nl), [Rijksoverheid.nl](http://Rijksoverheid.nl), and [overheid.nl](http://overheid.nl). [dutchmobilityinnovations.nl](http://dutchmobilityinnovations.nl) is the website where I&W shares their knowledge and developments around Dutch mobility, among them MaaS. All published documents on this website that are part of the subcommunity MaaS were scanned and assessed for their relevance. The website

of the national government (rijksoverheid.nl) and the data base of the government (overheid.nl) were used to find broader policy publications about mobility and the mobility transition in the Netherlands. On these two websites the search term 'mobility-as-a-service' was used to find specific policy documents about MaaS. The search term was allowed to occur anywhere in the document. It resulted in 188 results for Rijksoverheid.nl and 291 results for Overheid.nl. Each document was scanned and their relevance was assessed in a first inclusion round. For every included document MaaS had to be mentioned at least twice, and in such a way that it was *discussed* as a policy measure, rather than only *mentioned* as policy measure. This meant that the content of MaaS had to be discussed. When MaaS was mentioned in sentences like '*measures like MaaS will improve.....*' or '*the focus will be on data driven innovations, for example Mobility as a service*', the document was not included. For those cases the use of the term 'MaaS' was considered as too limited to analyse.

The two inclusion criteria shown in table 2 were not sufficient for creating a manageable amount of data. Therefore, an additional exclusion criteria were developed, in which the type and content of document were also considered. Table 3 shows what types of documents were included and what documents were excluded.

Table 2: Inclusion criteria for first selection round in data-collection process for discursive analysis

<b>Inclusion criterium 1</b>	Published between November 2017 and December 2021
<b>Inclusion criterium 2</b>	MaaS is mentioned at least twice in the document, and in such a way that it was <i>discussed</i> as a policy measure, rather than only <i>mentioned</i> as policy measure.

Table 3: Inclusion and excluded articles for second selection round in data-collection process for discursive analysis

What	Included?	Reason for exclusion
Policy reports, evaluations, strategies and future scenario's, published by the Ministry, the minister, or the State Secretary of Infrastructure and Water management.	Yes	Not applicable
Official communication from the state about MaaS, such as press releases or webpages on rijksoverheid.nl	Yes	Not applicable
Letters to the parliament written by the minister of Infrastructure and Water management or the State Secretary of Infrastructure and Water management.	Yes	Not applicable
Presentation slides	No	These are based on policy documents that were already included or excluded based on their (non)relevance
Minutes from oral meetings	No	These oral meetings are based on policy documents that were already included or excluded based on their (non)relevance.
Budgetary and financial plans	No	These are not about the content or design of MaaS itself, but about the process around it. Considered as not informative enough.
Publications where the ministry was one of the many publishers.	No	These publications are a result from collaborations between different parties, coming also from the market sector. Therefore, those documents are not representing the presentation of MaaS by the state only, but in a broader way.
Publications about the role of MaaS in an international context	No	This study focuses on MaaS in the Netherlands, and these documents about MaaS in an international context are therefore out of scope.
Protocols and contracts that were not about MaaS itself, but about the regulations and processes to make MaaS happen.	No	These are not about the content or design of MaaS itself, but about the process around it. Considered as not informative enough.
Publications by the Knowledge Institute for Mobility and Rijkswaterstaat	No	These publications are produced by the operational bodies of I&W, not I&W or the government themselves.

The first inclusion round resulted in 125 documents. Of these 125 documents, 8 turned out still not to be relevant after a more in-depth reading, and 45 other documents were excluded because they contained double information. Double information consisted, for example, of an already included document, but in another language. Another possibility was that two different included reports contained the exact same chapter regarding MaaS. This second inclusion round resulted in 74 documents, which was still too much to analyse. It was therefore decided to only focus on the core policy documents and communication of MaaS by the state. This meant that documents and reports in which MaaS was only a minor topic were excluded. Also documents used for the organisation of the pilot-programme were left out. Among those is for example an agreement between the ministry and private parties about the process of the pilots.

The final included data material consisted of 3 letters to the parliament, 3 webpages from the government’s website, 1 flyer, 1 more elaborate description of the pilot programme, and two policy reports. One of these policy reports was about future proof mobility in the Netherlands. MaaS is mentioned several times throughout the whole report and linked to other topics discussed in the report, which made it relevant enough to include it. Still, only the paragraphs and pages where MaaS was mentioned have been analysed, to create efficiency in the data analysis process. The other policy report comprised a composition of the plans of action from all the ministries. Of this policy report, only the table in which the regulation for MaaS was described, has been included in the data analysis. Although MaaS is only a minor topic in this report, it does describe the only regulative policy framework that has been created so far on MaaS. Therefore, it was assessed as crucial data for the document analysis. Table 4 shows a list of the final included data for the document analysis in arbitrary order. The total data collection process for the discursive analysis can be found in figure 9.

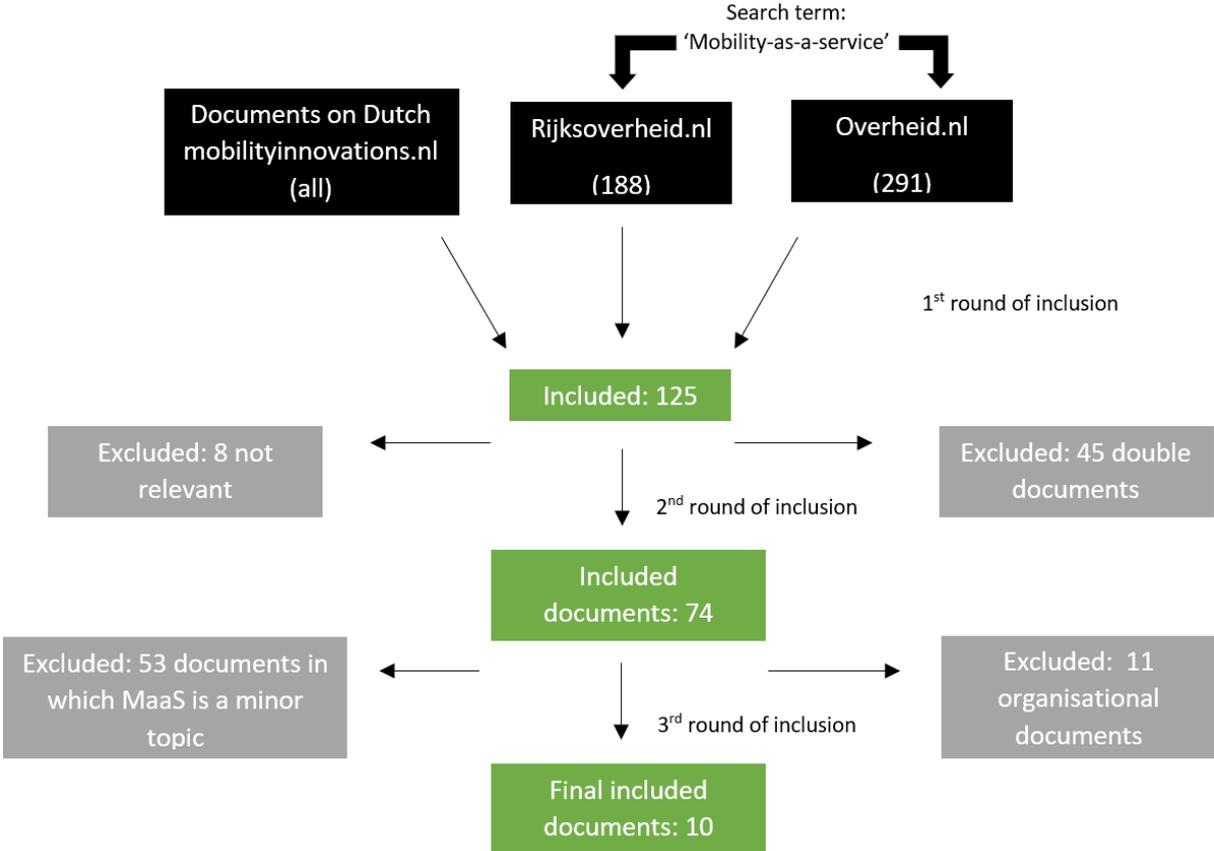


Figure 7: Overview of the data-collection process for discursive analysis

Table 4: Final included documents for the discursive data-analysis

<b>Title</b>	<b>Type of data</b>	<b>Publication date</b>	<b>Reference</b>
<b>Letter from the minister and state secretary of Infrastructure and Water management</b>	Letter to the parliament	25-06-2018	van Nieuwenhuizen Wijnbenga & van Veldhoven, 2018a
<b>Letter from the minister and state secretary of Infrastructure and Water management</b>	Letter to the parliament	20-12-2018	van Nieuwenhuizen Wijnbenga & van Veldhoven, 2018b
<b>Letter from the minister and state secretary of Infrastructure and Water management</b>	Letter to the parliament	11-07-2019	van Nieuwenhuizen Wijnbenga & van Veldhoven, 2019
<b>Future proof mobility – broad social reconsiderations</b>	Policy recommendation report	20-04-2020	Government of the Netherlands (2020a)
<b>Towards a balance in an integral mobility ecosystem – Mobility as a service: the Dutch approach</b>	General description of the pilot-programme (report)	06-10-2020	Ministry of I&W (2021)
<b>MaaS-pilots, Optimising the mobility system</b>	General description of the pilot-programme (flyer format)	31-05-2019	Ministry of I&W (2019)
<b>Planning, booking and paying your travel with one app</b>	Press release, webpage	26-06-2018	Ministry of I&W (2018a)
<b>Market parties show big interest to join Mobility as a Service</b>	Press release, webpage	20-12-2018	Ministry of I&W (2018b)
<b>Mobility as a Service (MaaS): tailored and multimodal travel advice</b>	External communication, webpage	No date	Ministry of I&W (n.d.)
<b>Fragment from: Plans of action, for each ministry</b>	Regulation about MaaS, part of bigger policy report	25-06-2020	Government of the Netherlands (2020b)

### 3.3 Data collection for Research Question 2

#### 3.3.1 The selected pilots

To answer the second research question, an empirical analysis of two MaaS-pilots was conducted. In 2019, I&W started with seven MaaS-pilots throughout the country. Each pilot focuses on a different challenge of personal transport and considers the specific circumstances of the location of that pilot. For example, the pilot in the Amsterdam Zuidas is focused on commuter-travelling, and the pilot in the more rural provinces Groningen and Drenthe focuses on inclusive mobility (I&W, 2019). The MaaS-pilots in Eindhoven and Amsterdam Zuidas have been selected as empirical case studies out of the total of seven pilots. Three out of the seven pilots are focused on a more rural area, and are thus out of the scope of this research that focusses on sustainable *urban* mobility. One pilot is focused on better collaboration and accessibility of an airport. This pilot is addressing a very specific problem, while the two selected pilots are focusing on broader purposes of mobility. The pilot in Utrecht could have been interesting as it is implemented in an urban area and it mentions the goal of decreasing private-car use. However, it focuses on residential travel only. The two pilots that have been selected for this study focus on a broader application of MaaS. Both the pilot in Amsterdam Zuid and Eindhoven are focused on big urban areas in the Netherlands and strive to upscale their MaaS-pilot as soon as possible to more target groups.

Table 5: Characteristics of the two selected MaaS-pilots (adapted from I&W, 2019)

	Amsterdam Zuidas	Eindhoven
<b>Main goal</b>	Improve the accessibility of the Zuidas	More efficient, effective and sustainable mobility that addresses better the needs of the traveller
<b>MaaS and sustainability</b>	Offers alternative for private car-use	Contributes to green ways of travelling
<b>MaaS and urban area</b>	Focussed on the connection to the whole metropolitan area of Amsterdam	Focussed on the accessibility of the growth region of Brainport Eindhoven
<b>Targetgroup</b>	Employees that can use it for residential-, work-, and business-related travelling	Employees that can use it for residential-, work-, business-related travelling

In the description of the pilot of Eindhoven sustainability is specifically mentioned as the main goal of the application of MaaS (I&W, 2019), which makes this pilot interesting for analysing the role of MaaS in the broader transition towards sustainable urban mobility. The pilot at the Amsterdam Zuidas is particularly interesting because of its important role for the whole metropolitan area of Amsterdam and its potential for national scale. Mobility in this area serves a lot of commuter-travelling and work-related travel from people around the whole metropole. Together the pilots cover the broad context of sustainable urban mobility, and are therefore representative cases for studying MaaS embedded in the context of sustainable urban mobility. An overview of each pilot is given in table 5 and described in more detail below.

#### 3.3.2 Pilot 1: Amsterdam Zuidas

At the Amsterdam Zuidas, accessible mobility and accessibility to your workplace is extremely important, since it is one of the most attractive business districts of the country: 35.000 employees and 30.00 students work there every day (Green Business Club, Hello Zuidas, & Taksforce Bereikbaarheid, 2014). Moreover, in the upcoming years the accessibility of this area will be even more challenged due to a big infrastructural project, which is expected to cause significant nuisance for car drivers going to the Zuidas. The goal of this MaaS-pilot is therefore to improve the accessibility of the district Amsterdam Zuidas on the short and long term, and in the end to upscale it to the whole metropolitan area of Amsterdam (I&W, 2019). The pilot was initiated by the municipality of Amsterdam and the Transport Region Amsterdam (in Dutch: Vervoerregio Amsterdam (VRA)), which is the principal of public transport in the region. The daily operation of the pilot is in the hands of Amsterdam Zuid, a separate department part of the municipality, focusing only on the development of the Amsterdam Zuid area (Blaas, 2018). The pilot mostly focuses on business-related travel, which means that employers organisations are one of the main stakeholders in the organisation of the pilots (Ministry of I&W, 2019). These employers organisations work closely with the Municipality in order to keep the Zuidas an

attractive economic area and represent the many companies located at the Zuidas (Municipality of Amsterdam, n.d.). The MaaS-provider in this pilot is Amaze mobility (from now: Amaze). After an experiment of two months on the feasibility and acceptability of MaaS (Arcadis, 2021), Amaze launched their MaaS-app in October 2021 (vanAtotZuidas 2021). The Amaze-mobility app is an app that offers several mobility options in once: different public transport companies, a taxi company, and shared bike, scooter and car brands are included in the app. Amaze promises its users that they can plan, book, pay and declare their travel, which makes public transport cards unnecessary. It also should give you an overview of your travel costs and expenses (Amaze, 2021). The app is still under development and in practice, Amaze is not meeting their promises (yet) (see textbox 1). The first 1000 users of the app will get 25 euro travel assets for free. By making more flexible choices, such as working from home, or preventing traveling in peak-hours, users are being rewarded by extra travel assets that can save up to 75 euro. Users fill in two surveys: one at the start of the pilot and one at the end. The results will give insights in the potential of the pilot for the switch from private to shared mobility, for the contribution to a safe and pleasantly travel, and for creating a CO2 neutral mobility system in this region (van Hamburg, September, 2021; Vervoerregio Amsterdam, 2021). The goal is to end up with a functional MaaS app that stimulates sustainable travel, and increases the traffic flow and accessibility of traffic (van Hamburg, September, 2021).

#### **Textbox 1**

##### *Experiencing the pilot: Using Amaze in Amsterdam*

To get a better understanding of the case, I travelled to Amsterdam on the 22<sup>nd</sup> of February and tried the Amaze mobility app. I had downloaded the app before and had unlocked the possibility to drive a scooter or shared car by confirming my driver's license, which went all very smoothly. I got ten euro travel asset from one of the interviewees involved in the Amsterdam pilot, which I used for trying out different transport modes. The app clearly shows the availability of different transport modes in the surroundings, but does not include a planning possibility (yet). From the user perspective I really missed this planning functionality, since now I still had to use a different planning app next to Amaze to end up at my destination. I used a shared scooter that I found through the app, but could not pay via the app yet, since the partnership between Amaze and this scooter brand was not yet completely arranged (This has changed since may 2022. Shared scooters are now fully integrated in the app (Santangelo, 4<sup>th</sup> of May, 2022)). I tried to buy a metro ticket, which was, due to an error message, unfortunately not working. Later that day, booking and using a bus ticket went very smoothly, including scanning the ticket on my phone in the bus. In the end I did not try out the shared bikes and cars, they only had specific pick up and drop off locations, that did not correspond with the places I wanted to visit that day. Back home, I shared my feedback with the interviewee from Amaze, who was very thankful for sharing my practical experience. He could also explain why some functionalities were not available yet. After all, it was a fun experience, that gave me a better idea of what MaaS means in practice. It contributed to a quick understanding of the interview data that I collected around that same time, and made me realise that MaaS is still very much under development.

### **3.3.3 Pilot 2: Eindhoven**

Eindhoven is the centre of the Brainport-region, a local growth-region in the south of the Netherlands focused on knowledge and technology. The economy in the region is growing fast, which puts pressure on public space and thus on traffic and infrastructure. The need for traveling smarter and greener led to the experimentation of MaaS (Brainport Eindhoven, n.d.). There are four main players in the MaaS-ecosystem of this pilot: the municipality of Eindhoven and the collaborative organisation 'Brainport Development, who are the two initiators of the pilot, the company ASML, and Turnn. The municipality views MaaS as a promising solution that fits with the strategy on accessibility of the bigger region (Bereikbaarheidsakkoord Zuidoost-Brabant (2016)) and with their own goal of becoming an emission-free organisation in 2025 (Municipality of Eindhoven, n.d.). The pilot in Eindhoven is therefore focussed on work-related travel of the employees of the municipality. This means the municipality is not only an organiser of the pilot, but also a customer of Turnn. In order to upscale the pilot in a later stage, ASML is involved, having a slight different focus than the municipality. ASML is a large tech company located in the Brainport-region and is testing the MaaS-app among its employees to not only focus on work-related travel, but also on commuter-traveling. They are facing the challenge of coping with a growing amount of employees that need to go to their campus, which is located near Eindhoven. With increasing numbers from 10.000 to 18.000 employees, building more parking spots will not be sufficient, which

is why ASML is looking for ways to change travel behaviour. Based on the evaluations of both ASML and the municipality, upscaling to more employers becomes possible, which on the longer term should lead to the expansion of the app to all citizens of Eindhoven (Mobiliteitsplatform, 2021). Turnn is the name of the MaaS-app and is developed by ICT Group N.V., that won the tender from different other enrolled MaaS providers in this pilot (Brainport Eindhoven, n.d.). The app is similar to Amaze in a sense that it can be used to plan your travel from door to door, and that you can use it for planning and declaring your travel (Turnn, 2021). In 2021 the employees of ASML and the municipality could start using the app and the expectation is that the app will be used by 25.000 active-users at the end of 2022 (Brainport Eindhoven, 2021).

### 3.3.4 Semi-structured interviews

Data about the MaaS-pilots was gathered by semi-structured interviews with actors part of the MaaS-ecosystem.

#### *Preparation of the interviews*

To prepare the interviews in a systematic way, first an interview blueprint was composed as a tool to develop an interview guide. The concepts of the POINT framework were used to determine the topics and aspects part of the interview blueprint. The interview guide followed from this interview blueprint included the questions, the order of the questions, and a topic list for each question. The interview guide can be found in annex 1 In order to prevent misunderstandings and to increase the internal validity of the interviews a pre-test of the questions was needed (Kallio et al., 2016). The interview guide was pre-tested with a PHD student, familiar with the Dutch MaaS case, on the 19<sup>th</sup> of January 2022. The pre-test consisted of asking the questions from the interview guide, after which the PHD student shared her thoughts and interpretation of the question. Based on this feedback the formulation of some questions in the interview guide was slightly adjusted.

#### *Finding interviewees*

To find the right persons for the interviews certain inclusion criteria had to be used (Robinson, 2014). An overview of these can be found in table 6 and will be further explained below.

*Table 6: Inclusion criteria for finding interview participants*

<b>Inclusion criteria 1</b>	Participant is related to the pilot because of his/her job
<b>Inclusion criteria 2</b>	Participant is able to explain why the pilot-project is being executed
<b>Inclusion criteria 3</b>	Participant fits in the state sector, the market sector, or the third sector (Avelino & Wittmayer, 2016).

The first inclusion criterium was that the person should know the specific pilot, which means he or she is related to the pilot because of his/her job. Additionally, the participant does not need to know about the broader mobility regime or the definition of MaaS necessarily, as long as he or she can broadly explain why the pilot-project is being executed. This second inclusion criterium was important to make sure that interviewees knew what they are talking about, which increased the internal validity and the relevance of the interview-data. The last inclusion criterium was that the participant is either active in the state Sector, the market Sector of the third sector as described by the MaP framework of Avelino & Wittmayer (2016). It was decided to left out the community and to not focus on the power dynamics in which the users of MaaS are involved. The two main reasons for this were the limited time available for data collection and data analysis (1), and the research scope (2). The research scope focuses on the Dutch MaaS case in which the government initiated a pilot-programme for MaaS. In this pilot-programme the users of MaaS are not playing an active role in decision-making and shaping of MaaS. They are the consumers of the service that MaaS is offering, and hardly involved in the organisation (Ministry of I&W, 2021). It was assumed that leaving them out would therefore have only a limited influence on mapping the power relationships in the Dutch MaaS-ecosystem. By focusing on the organisers of the pilots, and thus only include actors from the state, market, and third sector, the most influential stakeholders would be included in the analysis. More can be read about this in chapter 6, where a reflection on this limitation is described more elaborately.

Both purposive sampling and snowball sampling were applied to find on the one hand representative actors related to one of the MaaS-pilots, and on the other hand to facilitate the process of finding enough participants (Walliman, 2006). Participants were found by contacting persons working at I&W, searching for names in news

articles about the pilots, and by reaching out to the professional network of the researcher themselves via LinkedIn. In most cases potential interviewees were approached via LinkedIn with a message that included a short introduction of the researcher and the goal of the thesis. If they respond positively an email was sent to provide them with more information about the content and process of the interview. Some interviews were contacted directly by email or by phone, for example because another interviewee recommended them as potential interviewee, and shared their contact data with the researcher. To make sure an interviewee fit with the inclusion criteria, the potential interviewee was asked about his/her background knowledge of, and his/her relation with, the pilot first, before further steps were taken to arrange the interview.

Figure 10 and 11 show the individuals and organisations that were approached for an interview, respectively for the pilot in Amsterdam-Zuid and the pilot in Eindhoven. The actors are grouped according to the MaP framework. Based on a preliminary research of reading news articles about the two pilot projects, the actors were categorised in either the state sector, the market sector or the third sector. To decide in what sector an actor (group) had to be categorised, their specific role in the pilot was taken as reference point. For example, ASML in the pilot of Eindhoven: Despite being a big company and fitting in the market sector, in press articles about MaaS, they were mainly described as an intermediary organisation, and thus categorised as third sector actor for this specific case. To avoid that one sector would be overrepresented and to get a complete overview of the most important actors in the mobility regime, at least two actors of every sector described by the MaP framework (Avelino & Wittmayer, 2016) were interviewed. This means at least six interviews were done for each case study, considering the three sectors of the MaP framework (Avelino & Wittmayer, 2016). The market sector contains a lot of different actors. An important actor group within the market sector comprises the transport operators. Transport operators are all organisations that have the assets to provide mobility, such as a shared car company or a bus company. During the interviews it was found that public transport companies were very influential transport operators regarding the power dynamics in the MaaS-ecosystem. Of all transport operators, it was therefore decided to approach two public transport companies: Transdev and The NS. Transdev provides different kinds of public transport on regional level and the NS is the official Dutch train organisation (in Dutch: Nederlandse Spoorwegen). In the end, only Transdev participated, as the NS did not give a sufficient respond in time. Transdev is involved in both pilots. It resulted in a sufficient data collection of six interviews for the pilot on Eindhoven, and seven interviews for the pilot in Amsterdam Zuid, of which the interview with Transdev overlapped. An overview of the interviewees can be found in annex 2.

In total 12 interviews were taken between the 31<sup>st</sup> of January and the 15<sup>th</sup> of March. The interviews lasted between 45 and 60 minutes and were held and recorded online via Microsoft Teams. This software was also used to partially transcribe the interviews. After conducting the interviews, the recordings were transcribed with the help of the automatic transcription tool in Microsoft Teams. The transcribing process is an attempt to make the data readable and possible for interpretation, to cope with the messy data that speech provides you (Walliman, 2006). The transcripts were uploaded in Atlas.ti for further analysis.

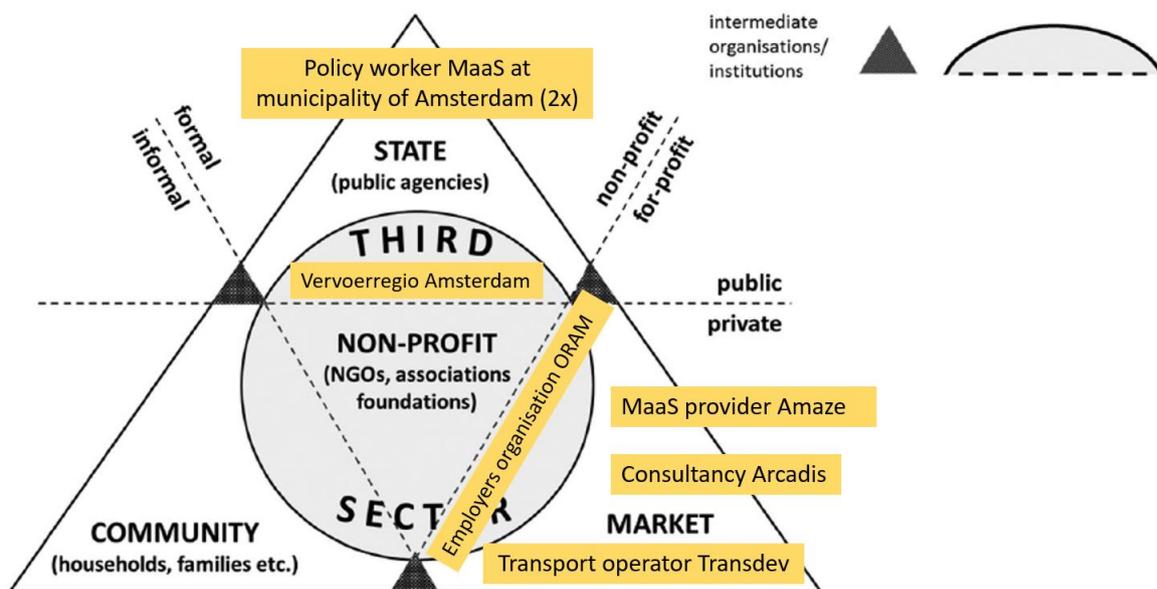


Figure 8: Interviewees from the pilot of the Amsterdam Zuidas

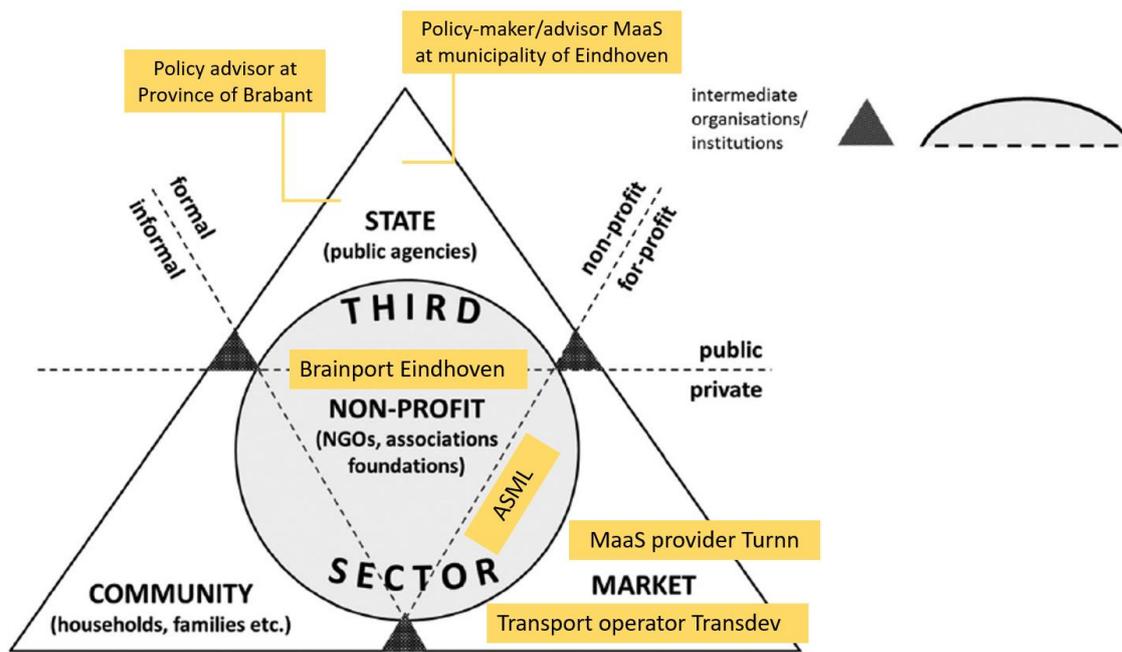


Figure 9: Interviewees from the pilot of Eindhoven

### 3.4 Ethical considerations

All interviewees gave their informed consent for participation, the recording of the interviews online, and the storage of their data. They had the possibility to withdraw from the research at any time, which is an important ethical premise when doing interviews (Walliman, 2006). Their data has been processed and analysed with them being anonymous. No names are used in this report, only the following information has been used to write the report: the sector according to the MaP, the pilot, and the organisation to which the interviewees belong. This information needed to be mentioned in order to understand the results properly as a reader. The interview recordings were deleted after finalizing this thesis and the transcripts have been sent to the chairgroup of Environmental Policy, part of the Wageningen University and Research. There, they are stored behind a digital protection layer. The transcripts will be destroyed after five years of storage.

## 3.5 Data analysis

### 3.5.1 The discursive analysis of the state documents

Following the methodology of discourse analysis, the data analysis consisted of an extended and iterative process of reading, coding, and interpreting (Taylor, 2013). This was done with the support of Atlas.ti, a qualitative data management software programme. All the included documents and chapters about MaaS were read extensively and at least twice. The purpose of the first time reading was to become familiar with the data. Certain sides notes were made without doing any real analysing yet. The data was approached as data on itself, with an open-mind and as independent from other related persons or events. This process of 'bracketing' was important to approach the data as much as unbiased as possible ( Taylor, 2013).

The next step was to code the data. With the help of Atlas.ti, keywords could be identified, sections were selected, and a code or several codes could be assigned to those (Koenig, 2004). A combination of open-coding and theory-informed coding was be used. The theory-informed coding consisted of applying codes defined in a provisional code book. These were based on the concepts of 'transition as discourse' (Audet, 2016) and contributed to look with an analytical lens to the data. Additionally, a more open-coding strategy was applied to allow the researcher to add new codes to the code book during the process of analysing. The open-coding stimulated the researcher to stay open-minded and less biased to only find the radical and technocratic transition frame from Audet (2016). The coding supported the process of starting to see patterns and similarities in the data. During the coding process the provisional code-book was adjusted and extended. The process of coding and analysing is an iterative process (Miles & Huberman, 1994), and so, during the analysis a constant switch was made between the documents and the code-book. The final codebook used for the analysis is included in annex 3. It includes the definitions of the codes and therefore offers transparency in how each code was applied. This increases the validity of the analysis (Taylor, 2013). While applying the codes, sometimes comments and memos were made as well, in order foster the process of analysing. Based on the structure of the codes, the comments and memos, similarities between the documents could be determined. Different framing strategies were found that are presented in chapter 4.

### 3.5.2 Data analysis of the interview data

After the transcription of the interviews a similar process compared to the analysis of the policy documents was executed: extensive reading was alternated by coding and interpreting in Atlas.ti. The analysis consisted again of a combination of theory-informed coding and open-coding: The majority of the codes were based on concepts from the POINT framework. Some codes from the provisional code-book used for the discursive analysis were also used in the provisional code-book used for analysing the interviews. These codes were more general or played a role in both theories. Other codes and code groupings were added later based on remarkable findings determined by the researcher. Revising codes or deleting a concept-based code sometimes was necessary when it turned out it was overly abstract. The final code-book can be found in annex 4. Similar to the discursive analysis a structure was defined in the codes and the final interpretation was done with the help of the insights of Avelino (2017) and Avelino & Wittmayer (2016).

### 3.5.3 Developing the provisional code-books

To limit the amount of revisions and to make sure the codes would be applied in the right way, the definitions in both provisional code-books were co-checked by another social science student. This increased the internal validity of the analysis as a whole. The co-checking was not done for the codes developed throughout the analysing process, as this was an ongoing process in which alterations were made constantly. It would have been an extremely time-consuming process for both the research as the student that would be doing the co-check, and was therefore decided not to do.

## 3.6 Answering the main research question

For the interpretation, the findings from the document analysis and the interviews were interpreted separately, to prevent that inaccurate connections and interpretations were made. The final step was to interpreting everything together. By putting the findings of the document study next to the findings of the interviews it became possible to see similarities or remarkable differences between how the MaaS niche is framed by the government and how this works out in practice where the niche starts to interact with the

mobility regime. This last step was necessary to connect the second research question to the first one and to work towards a conclusive chapter in which the answers on both sub questions are taken together to answer the main question of this thesis.

## 4. The MaaS frame as power resource

### 4.1 Introduction

The government presents MaaS as an innovative mean that is supporting the digital mobility transition by offering many opportunities for society. In the general explanation of the Dutch MaaS approach the government states: *“Despite MaaS not being there yet, it could be a stimulating innovation in the mobility transition towards a smarter, more sustainable use of energy, capacity and spatial landscape.”* (Ministry of I&W, 2021, p.4). The mobility transition as mentioned in this general description about MaaS by I&W cannot be viewed separately from the digital transition. They are inextricably linked: digitalisation is a requirement for the mobility transition, while the mobility transition goes further than digitalisation only. As put in one of the letters to the parliament, written by the minister and state secretary of I&W: *“Thanks to the prospective further digitalisation and flexibility of mobility we are heading towards a transition phase. We not only see the rise of new transport modes, but also the development of travel information-apps into intelligent multimodal travel-apps that help users travelling smarter, more sustainable, cheaper and according to their individual needs.”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p. 1). Although not explaining the exact impact on a smarter and more sustainable society, it demonstrates that the innovativeness of MaaS lies in the role it could take in connecting the digital transition with the mobility transition.

This chapter takes as a starting point the Dutch governments’ view on MaaS as part of the digital mobility transition. It examines how the discursive framing of MaaS by the Dutch government shapes the MaaS niche. This will help to analyse the powerplay of the MaaS-ecosystem in the next result chapter. First, the discursive frame of MaaS will be unpacked by presenting three discursive statements derived from documentation about the Dutch MaaS approach. This is followed by an explanation of how these statements are used to create a coherent storyline. Finally, the discursive framing of MaaS is viewed in broader light of transition framing by the government. This time the ‘transition as discourse’ (Audet, 2016) is used to understand how the frames applied by the government are used as a power resource.

### 4.2 The discursive frame of the Dutch MaaS approach

Both process wise and outcome wise MaaS is framed as innovative with collaboration as key characteristic and requirement. Not in the first place because it requires different skills and knowledge backgrounds, but even more because it is only then that it offers opportunities for all the different stakeholders involved. These opportunities can be created as an output of MaaS, but also during the process of creating and implementing MaaS. This innovative and collaborative frame is what the government calls ‘the Dutch MaaS approach’ (Ministry of I&W, 2021). The frame exists of three discursive statements: MaaS is a Win-win solution (1), MaaS is something that needs to be regulated by the government (2), MaaS is something we can learn from (3). Each statement is explained in the next sections.

### 4.3 Discursive statement 1: MaaS is a Win-Win solution

First of all, MaaS is framed as the ultimate opportunity, as the win-win for the society as a whole, for the government, and for business: *“And although MaaS is still under development, one thing is clear: MaaS offers a lot of opportunities. For the traveller, the public transport and shared mobility sector, the MaaS providers, states, and eventually for the whole society.”* (Ministry of I&W, 2021, p. 21). Words that are returning in the letters to the parliament (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b; van Nieuwenhuizen Wijbenga & van Veldhoven, 2018a) and the general MaaS description (Ministry of I&W, 2021) that are directly confirming this statement, are the words ‘win-win’, ‘MaaS offers chances for...’ and mentioning ‘that the total cake is growing’ because of MaaS. More indirectly, the government is communicating about this discursive statement by describing the different opportunities for respectively society, business and herself as government.

The first opportunity that the government describes is MaaS as a smart and sustainable solution for the public. The government defines MaaS as follows in one of their documents: *“Briefly noted, MaaS stands for the all overarching services (often provided via an app) that offer planning, booking, travelling and paying services for*

*a complete door-to-door trip with all types of modalities (shared car's, bikes, ridesharing, (water)taxi, public transport, parking etc.)."* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p.1). MaaS is therefore presented as an all-inclusive solution, being multi-modal, including all travel-related services (planning, booking, paying, declaring), and offering a trip from door-to-door. MaaS includes multi - preferably all - modes of transport, the travel advice included in MaaS is tailor-made, and the user is put in the centre of the innovation. What makes MaaS smart is that it makes it possible to fulfill the individual wishes of a traveller, as it offers flexibility for the user in choosing and planning his trip. Closely related to this flexibility and tailoring, are the returning comments on MaaS as being something that is user-friendly and something that can 'unburden' the user during his travel. The focus on the user of MaaS is seen as something innovative and therefore very important for fostering the transition to sustainable mobility: *"not the way you travel, but the traveller is put in the centre. This is how we work on sustainable mobility."* (Ministry of I&W, 2018a). Although the word 'sustainable' and 'sustainability' are used regularly in the documents, it stays unspecified what exactly is meant by it.

Following the description of MaaS being multifunctional and flexible, the government is highlighting the advantages it has for the public: it offers a new, more comfortable way of travelling. Besides, MaaS is not only fulfilling individual needs, but is also able to cope with multiple societal challenges. Among these challenges traffic jams and keeping regions accessible for everyone are mentioned most often by the government. Other repeated challenges that are mentioned are keeping transport affordable, coping with the limited possibilities to expand infrastructure, and offering easy transboundary transport in the border area. The range of problems that is covered by presenting MaaS as a solution is wide. To summarize, the government therefore uses the words "optimising the mobility system" as the ultimate goal of MaaS. It reflects that the government perceives MaaS as crucial smart and sustainable solution in the mobility transition, expecting that it will have a large impact on society.

A second opportunity that is described by the government is MaaS as a governance instrument. Just like the benefits for the public, which are presented as complete and all-embracing, the benefits for the government are also defined in a very broad way: *"For the Netherlands, MaaS is much more than just a smart travel-app that gives you access to different transport modes and that you can use for paying your trip. With MaaS, states can gain insight in mobility movements that goes beyond the modalities. And based on integrated data we can learn on group level how to steer on theme's like sustainability, quality of life, traffic safety and other covering policy goals."* (Ministry of I&W, 2021, p. 4). The term 'covering policy goals' is returning in some of the other documents as well, as a mean to show how MaaS can also contribute to other fields than the mobility sector only, such as the field of sustainability, data-protection, or the built environment. How MaaS as a governance instrument will work out in practice is not specified, as it is presented as a goal to be reached on the longer term and therefore not concrete yet.

The last opportunity described by the government and part of the discursive statement that MaaS is as win-win solution, is MaaS as a business case. With MaaS being a business case it offers economic opportunities for mobility companies. The government stresses the importance of MaaS staying a viable business case after the pilot-programme to guarantee its future existence. Although mentioning this as necessary, the government does not present this as a big challenge, but again as an opportunity: MaaS can bring only benefits for market actors, and a business case of MaaS will thus only contribute to the win-win of MaaS: *"....this may seem very difficult in practice with so many different parties and interests involved, but eventually transparent collaboration offers mainly chances. MaaS will not only lead to a sustainable mobility system, but eventually also to a viable business case for all participants."* (Ministry of I&W, 2021, p. 15).

#### *The requirements of MaaS*

The win-win statement is built up from presenting the different opportunities of MaaS as a smart and sustainable solution, governance instrument and business case, and is therefore addressing a wide range of stakeholders. Part of this statement is also telling what is needed to make this win-win reality. The government might be extremely positive about MaaS, but also acknowledges that it will not happen without setting the right circumstances. It mentions many requirements and needs for a successful implementation that they summarize in 'sharing together', 'working together', and 'learning together'. Where the role of innovation was

mainly reflected in MaaS as smart and sustainable solution (one of the described opportunities of MaaS), the role of collaboration becomes clear now. In the win-win statement the three ‘togethers’ are summarizing what the government frames as crucial for creating a win-win out of MaaS. After all, if not all three ‘togethers’ will be met, not all stakeholders will benefit as much from it and a win-win will stay out.

*Sharing together* refers to sharing *data* together, explained by the government as something that can only be done by a well performing data infrastructure. This requirement is inextricably linked with the fact that the government sees MaaS as a smart solution, playing an important role in the digital mobility transition. Part of this transition is *“the shift from policy formation driven by modality, to policy formation on mobility driven by data”* (Government of the Netherlands, 2020b, p. 27) and this requires open sharing of data by different stakeholders. The government uses the adjective ‘MaaS-worthy’ to explain that an app only fits within MaaS when it meets the technical demands on data-sharing. Moreover, they stress the importance of *“talking the same data-language”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019, p. 3), which also demonstrates the need for sharing data together.

*Working together* refers to what the government presents as their new way of public-private governance for the mobility sector, called the Rijnland Model: *“To realise MaaS, a close collaboration is needed between the ministry, the seven regional governments, the (to be selected) MaaS-providers, and the transport operators.”* (Ministry of I&W, 2019, p. 2). This model, in which mobility is not fully privatised nor state-owned, but where private companies are regulated by the government, includes an integrative way of policy making around mobility and the broader policy goals behind it. The government stresses the importance of collaboration and transparency between all the different market actors and the government and uses concepts like *“A voluntary ecosystem”*, and *“a level-playing field”* to display this.

Lastly, *learning together* refers to gaining experience on MaaS. This need is mentioned explicitly by highlighting the importance of the development and use of a learning environment. *“The intention is that the learning environment will continue to persist as a part of the earlier mentioned ecosystem”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019, p. 6). It is claimed that experience will lead to an insight in what is needed to support MaaS in the future.

#### 4.4 Discursive statement 2: MaaS is something that needs to be regulated by the government

MaaS is presented as something new, not only because of the innovative outputs it can create, but also because the process behind MaaS is framed as innovative: *“The unique Dutch approach of MaaS – steering to public values by a public-private partnership – asks for a new governance model. The more traditional discussion models and tables are not sufficient anymore. It is time to think differently. Beyond transport modalities, but also with eye for other theme’s like data-exchange, privacy and sustainability.”* (Ministry of I&W, 2021, p. 21). As this quote shows, the government presents the public-private way of ‘working together’ as innovative, stressing both collaboration, and the need for governance. This need for governance is interesting, as the government seems to focus in their framing of MaaS on top-down governance on the one hand, and a public-private way of governance on the other. In one of the parliamentary letters it is stated that *“The main goal of the pilots is to learn. Moreover, the expectation is that, during the pilots, we will gain more insight about a suitable way of governance for the MaaS-ecosystem”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019, p. 6). The governance of MaaS is presented here as something that will be shaped during the process of creating MaaS. However, at the same time, the government is very clear about the role and the regulated governance it applies in the pilot-programme: the government uses measures that are clearly top-down governance, such as a ‘Framework agreement’ (in Dutch: Raamovereenkomst), and setting clear selection criteria for market actors. *“Making it mandatory for transport operators, mobility providers and MaaS-parties to share data, brings management closer to the government and will lead to more efficient solutions. This needs to be prolonged by rules and regulations.”* (Government of the Netherlands, 2020a, p. 69). Although market actors sometimes can give their consult and feedback, the government clearly presents themselves here as the driving force and director of the public-private collaboration. This position of driving force can also be assumed from the fact that the government sees themselves as driving investor of MaaS:

*“The intention is that the co-financing of the national and regional states will be a helping hand for the private companies that will implement the pilots (the MaaS providers), during the starting phase”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p. 2).

The directing role is sometimes even literally mentioned, like one of the letters to the parliament demonstrates: *“As government we filled in our role as director gradually, for example, when it turned out to be difficult to get the collaboration between transport operators and MaaS providers (...) off the ground”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019, p. 6). What is remarkable about this quote is that the government frames their top-down role as director as necessary to guarantee a successful collaboration within MaaS. The distinction between top-down and public-private seems rather complementary for MaaS than conflicting. The need for regulation and an active role for the government is reflected also in the other roles that the government gives themselves in the programme. In a press article they state: *“During the development of MaaS, the government takes the role of active intermediary. This is in the interest of standardisation, safety and privacy”* (Ministry of I&W, n.d.). The public interest of protecting privacy and keeping regions accessible is stressed also in other documents to argue why steering and regulation is necessary. Being an ‘independent mediator’ allows the government to bring parties together, to foster the collaboration that in their eyes is needed, and to serve the public interest at best (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p. 4).

#### 4.5 Discursive statement 3: MaaS is something we can learn from

The exact effects of MaaS on society are framed as unknown: how it exactly will impact society, trigger the market, and shape policy is presented as very uncertain. This uncertainty is clearly put forward by the government by admitting the lack of knowledge in general (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019 p. 5), the need for practical experience (Ministry of I&W, 2018b)), and the need for more research (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018a, p.5). The chance of being confronted with the possible or unforeseen negative (side)effects of MaaS, mentioned in one of the letters to the parliament (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018ab), also fits within this uncertainty framing. Rather than a negative characteristic, this uncertainty is presented as a learning opportunity. ‘Learning together’ is a crucial aspect of the process of MaaS and a logic follow-up on the uncertainty that all parties are confronted with.

Next to this framing strategy of uncertainty, the discursive statement about MaaS being a learning opportunity is supported by framing MaaS as an experiment. The fact that demonstrates this most clearly is the choice for a pilot-programme. Using the word ‘pilot’ implies a space where learning is possible. Other words that the government is using regularly in her documents and that support this framing strategy are ‘experimenting’, ‘being tested’, ‘investigating’, ‘gaining insight in...’, ‘monitoring’, and ‘learning together from....’. The reason why the government has chosen for a pilot-programme is coming back in almost every document: *“Also we have decided to co-finance the seven MaaS-pilots. Via these pilots we want to get more insight in the effects of MaaS. To maximize the learning effects, the pilots have different objectives and learning questions”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018a, p. 4). In this statement the aspects of an experiment (objectives and learning questions) are directly connected to the opportunity to learn from MaaS. A pilot-programme offers the possibility to gain experience and insights, and to experiment with MaaS in practice. Moreover, monitoring the pilots via a knowledge- and learning environment is an important aspect of the process as well. It supports the statement about that we can learn from MaaS, while at the same time it highlights the importance of learning *together*. It is, after all, a common learning environment, that provides a space for state and market actors to both learn from the MaaS-pilots.

## 4.6 The discursive statements solving conflicting claims in the MaaS frame

The three discursive statements demonstrate how the Dutch MaaS approach is framed as innovative and collaborative, and as a means in the digital mobility transition (see figure 12). Besides contributing to this coherent presentation as being innovative and collaborative, each statement is used to create structure and a logical storyline in the presence of some conflicting framing of MaaS. It shows how the government is shaping the MaaS niche and their own role in it, by putting this frame forward.

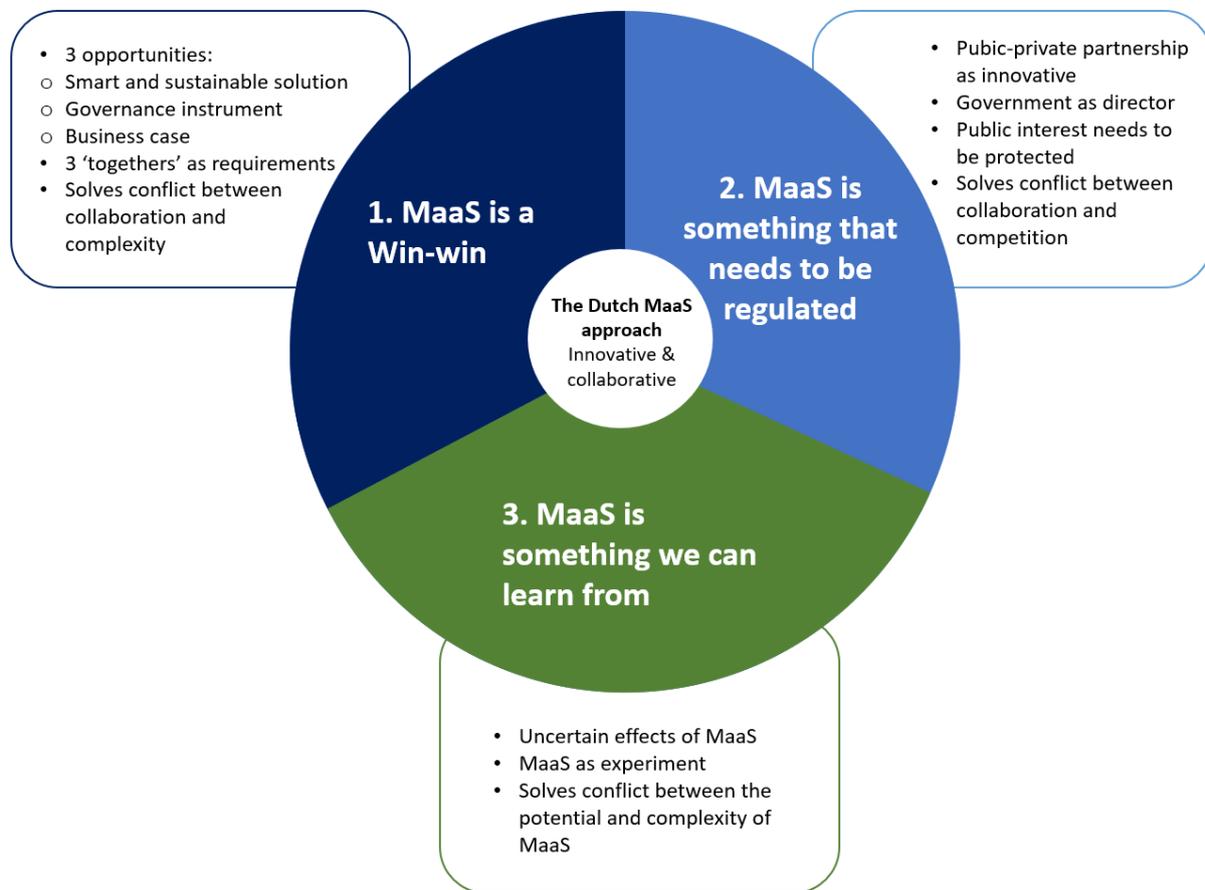


Figure 10: The Dutch MaaS-frame created by the government

### 4.6.1 Win-win: solving the conflict between collaboration and complexity

The government expects complex policy challenges when it comes to securing sustainability and quality of life, and admits that the mobility transition touches upon a very broad spectrum of societal problems. The complexity that comes along with these problems is something the government does not deny at all. In the general description of MaaS (Ministry of I&W, 2021) the multidimensional aspects of MaaS as well as the many interests involved are acknowledged. It is admitted that the differences in interest between market and state, but also between different market actors, brings difficulties for fostering the transition. It is these different interests, rather than the lack of technology that is understood to make the implementation of MaaS challenging: *“The technology is there, the willingness too. Still, such an integral app not yet existing, and having one on national level seems even further away. Why not? Many parties, many interests”* (Ministry of I&W, 2021, p. 5).

On the other hand, collaboration is presented as key for MaaS, which is a major challenge considering the diverging interests the government is pointing at. The statement about MaaS being a win-win for everyone converges the conflicting claim of requiring collaboration on the one hand, and doing this in an extremely complex environment on the other. The win-win statement confirms the complexity, by stressing the multidimensional impact that MaaS can have on society. It addresses the different interests of market, state and the community by offering opportunities for all of them. Still, collaboration is very much important and put

as the main requirement to make the win-win happen. However, thanks to the win-win statement, the collaboration is not seen as a major challenge in the transition, but as a solution, and even able to offer benefits for all stakeholders involved. It puts the MaaS niche in an extremely positive light.

#### 4.6.2 A regulated MaaS: solving the conflict between collaboration and competition

The requirement of collaboration as a determining factor for the success of MaaS seems to be in conflict with another claim: The emphasis that the government puts on economic welfare, which is expressed by repeating the importance of a business case for MaaS both as a requirement and an outcome of it. A business case implies a competitive market, something that is fostered by the government themselves by starting the pilots. Part of these pilots was organising a tender that could be won by only a limited amount of parties. While the government stimulates competition on the one side, they keep on repeating the importance of collaboration and warn for competitive commercial interests on the other: *“Besides the positive effects, there could be negative (unforeseen) side effects, like monopoly creation (...), or an overflow of supply (...). After all, MaaS is still a non-regulated (internet)platform. (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p. 2).* In this letter to the parliament the situation of having a non-regulated MaaS is used as explanation for the negative side effects resulting from competition. The discursive statement about that MaaS needs to be regulated is thus used as a mean to converge two conflicting claims: The claim about needing collaboration to guarantee the success of MaaS is converged with the claim of needing a competitive market to guarantee the success of MaaS. A MaaS that is regulated, fosters collaboration and helps steering to the right public goals, while at the same time enables market actors to join the competitive mobility market. The government therefore shapes the MaaS niche into an economic space that is important for the public interest

#### 4.6.3 Learning from MaaS: solving the conflict between its potential and its complexity

The last discursive statement that was found is that MaaS is something we can learn from. According to the government, learning tends to be necessary, because how MaaS will impact society and how the innovation will look like on big scale in practice is unknown. The government proudly mentioned that their pilot-programme is the first large scale experiment on MaaS ever done (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018b, p. 2) and that they are aware of the great complexity that comes with MaaS: *“Whether certain developments are a direct effect of MaaS, is hard to proof. Specific factors that determine the success or failure of MaaS and their influence on the transport system are very hard to isolate”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2019, p. 6). Learning as a solution for uncertainty seems an obvious answer. However, this uncertainty seems rather strange from the perspective of the big promises the government makes about MaaS. The sometimes extremely positive claims about MaaS are conflicting with the uncertainty the government expresses simultaneously. In a letter to the parliament it is said that *“Together with business and regional governments, we are looking forward to learn and to experiment in order to find out if this potential can be harvested”* (van Nieuwenhuizen Wijbenga & van Veldhoven, 2018a, p. 6). What this quote demonstrates is the use of the third discursive statement as a mean to create a logical storyline around the uncertainty on the one side and the potential on the other. By framing MaaS as a learning opportunity, the government enables herself to cope with the uncertainty without giving up on any of the promises that MaaS makes. Again the MaaS niche is put as something extremely positive, and although its impact on the regime might be unknown, it is framed as if the uncertainty can be managed and controlled.

## 4.7 The overlap between the technocratic transition frame and the MaaS frame

All three statements contribute to the coherence of the Dutch MaaS frame as innovative and collaborative initiative. Figure 13 shows the similarities between this frame and the technical transition frame as defined by Audet (2016). Although the general mobility transition was not mentioned often in the documents included in this study, the MaaS framing shows how the government frames the mobility transition more generally in a technocratic manner. Below it will be explained how the MaaS frame overlaps with the technocratic transition frame and how the state is using it to legitimize its own MaaS policy as a niche within this transition.

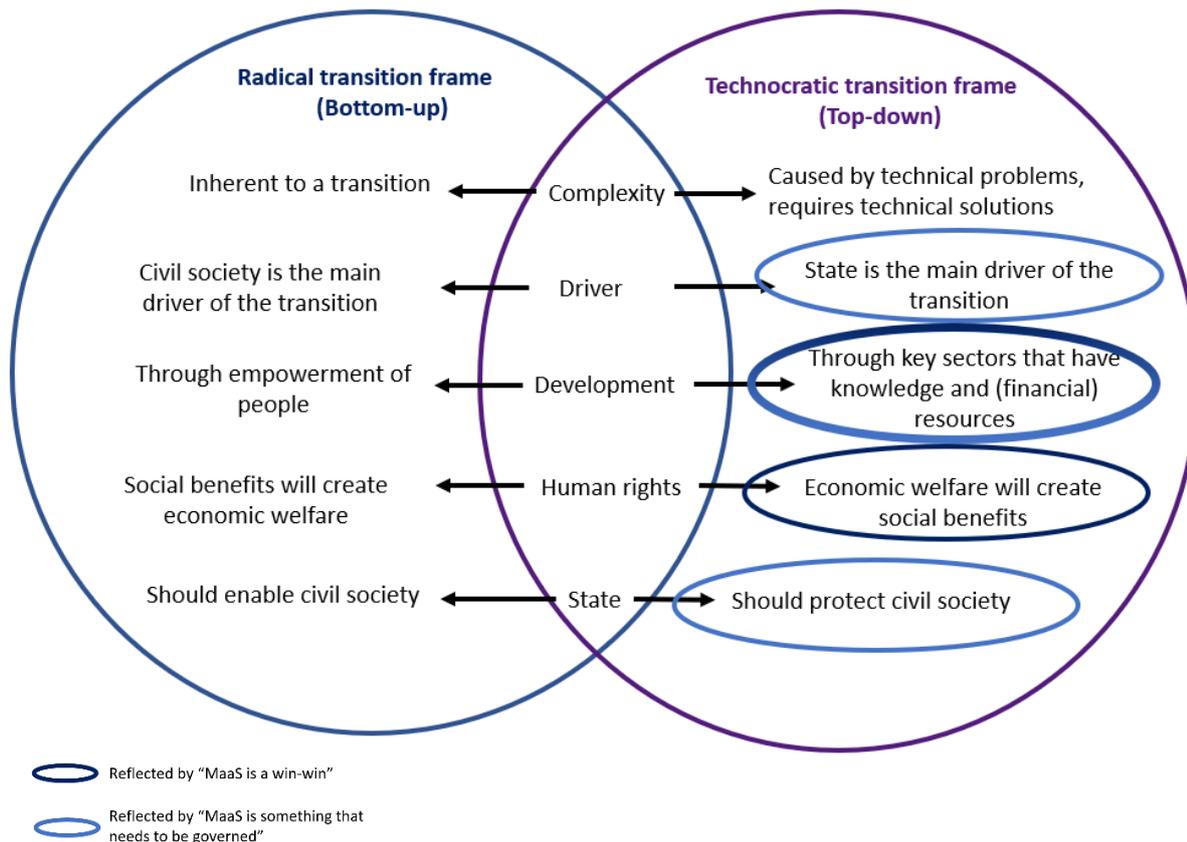


Figure 11: How the MaaS frame overlaps with the radical and technocratic transition frame from Audet (2016)

### 4.7.1 The technocratic transition frame applied on MaaS

First, the win-win statement reflects the technocratic idea that economic welfare will create social benefits. The win-win statement presents the many social benefits of MaaS, under the condition of certain requirements. The most obvious requirement is collaboration, by which this statement is able to cope with the complexity of MaaS as explained in paragraph 4.6.1. Another, more indirectly mentioned requirement for MaaS, is the need to upscale MaaS as fast as possible. This requirement can be linked to the opportunity of MaaS being a business case, part of the win-win statement. The government presents the business case of MaaS as an opportunity for business actors, but this need to upscale also frames the business case as a requirement for the future existence of MaaS. This is mentioned more implicitly, though very well present in sentences like "no cash without mass" (Ministry of I&W, 2021, p. 4) and "as soon as possible they need to stand on their own two feet" (Ministry of I&W, 2019, p.2). A viable business case as a requirement for the win-win situation demonstrates the economic interest of the state and that they see it as crucial for harvesting the benefits of MaaS. Using the win-win statement is therefore not only a contribution to a coherent MaaS frame, but in a broader context of the mobility transition also reflects the application of a technocratic transition frame by the government.

Second, the regulated MaaS statement represents the state as main driver and protector of civil society. In paragraph 4.4 it was stated that the government presents her directing role and being the driving force of MaaS as necessary to foster the collaboration and to prevent negative externalities. This reflects the technocratic transition frame in two ways. First, the government clearly puts herself here in this position of being the main driver. Second, framing a regulated MaaS as necessary to prevent negative externalities points to the role of state as protector of civil society. Looking at the MaaS niche specifically, it is about protecting civil society from big Tech companies like Google and Uber. The application of technocratic transition frame enables the government to legitimize their current top-down governance, while at the same time still being able to focus on MaaS as an innovative way of governance.

Third, by emphasizing collaboration in the MaaS frame, certain actors are put forward as key players of the transition. Something remarkable can be said about the focus on collaboration that is very present in the MaaS frame and all three discursive statements. Namely, when the government is talking about any of the three 'togethers', they are always pointing at a collaboration between a specific set of actors: *"In order to realise MaaS, a close collaboration between the ministry, the seven regional states, the (to be selected) MaaS providers, and the transport operator, is needed"* (Ministry of I&W, 2019, p. 3). Thus, the 'together' refers to a collaboration between key sectors, showing the importance the government is putting on these type of actors for the transition. It is the technocratic transition frame in which this focus on key sectors is important, showing again the overlap with the MaaS frame.

## 4.8 Summary and conclusion

In this chapter the discursive framing of MaaS in the Netherlands was analysed by looking at Dutch policy documents. The discursive framing of MaaS, shows that the government applies a technocratic transition frame on the broader sustainable urban mobility transition. The MaaS-frame consists of three discursive statements that all present the Dutch MaaS approach as an innovative and collaborative initiative. By applying these statements, they are able to legitimize and explain the top-down organisation of the pilot-programme and their own actions and position in the MaaS niche. While shaping the niche as something extremely beneficial for society and market actors, the government positions itself as key player and steering actor. Their actions that follow from this powerful position, such as fostering competition and setting requirements, are explained by the need for a regulated MaaS. By putting the focus on collaboration, they address the exact players that they define as key players in the transition. Using the MaaS frame therefore is not only empowering the government itself, but also the those who are defined as the key players by the government. Moreover, the technocratic transition frame used for the sustainable urban mobility transition, as well as the MaaS frame itself, shapes the MaaS niche as economic market space and helps the government arguing for the focus on economic growth in MaaS. Both the MaaS frame and the technocratic transition frame can therefore be seen as powerful resources of the government, shaping the MaaS niche. The next result chapter looks further into the way power is exercised. It examines the power relationships and dynamics that are existing between the different actors in the MaaS-ecosystem. It therefore will give insights into how the MaaS-frame as put by state-documents is having its impact on the powerplay of MaaS in practice

# 5. The power relations in the MaaS-ecosystem: looking at the pilot in Amsterdam and Eindhoven

## 5.1 Introduction

The government plans, writes and thinks through the process of MaaS in policy documents, by which they create a certain MaaS frame. The MaaS-ecosystem, however, consists of many more actors than the government only. This chapter attempts to create an understanding of the power relationships between the different actors in the MaaS-ecosystem. Using the perspective on power from the POINT framework (Avelino, 2017), this chapter argues that power should not be seen as static, and that power dynamics may shift over time. This is done by analysing the pilots in three subsequent phases, which each showing specific characteristics considering the power dynamics in the MaaS-ecosystem. The first phase concerns the preparation of the pilots, phase 2 is about the operational and practical implementation of the pilots, and the third phase is about the interviewees' expectations on the future of MaaS.

## 5.2 PHASE 1: Preparing the MaaS-pilot for implementation

In 2018, the ministry of I&W took the initiative to set up different MaaS-pilots in the Netherlands. To get the pilots running, they coordinated a process of preparation, in which the operational parties of the pilots were selected. The result of this preparation process was the national Framework agreement (Raamovereenkomst (ROK), 2018), and for each pilot a 'Nadere Overeenkomst' (NOK), a more specific agreement based on the needs of the region. This process is categorised as phase 1 of the pilot programme. By being the initiators, state actors are taking a powerful role in the MaaS-ecosystem. It results in different power dynamics that are dominated by collaboration, as displayed by table 7.

Table 7: Power dynamics important during the preparation of the MaaS-pilots

Power relations		Power dynamics	
Power over	<b>Mutual dependence</b> State depends on MaaS-provider, but MaaS provider also depends on State	<b>One sided dependence</b> Market actors depend on municipality, but municipality does not depend on Market actors	<b>Independence</b> A and B do not depend on each other, they have no power over each other
More/ less power to	<b>Cooperation</b> <ul style="list-style-type: none"> <li>Key players in steering group and project group help each other</li> <li>Third sector exercises more power than MaaS-provider, but third sector and the MaaS-provider have similar, collective goals</li> <li>Market actors in consortia have similar goals</li> </ul>	<b>Competition</b> A exercises more power than B, while A and B have mutually, exclusive goals	<b>Co – existence</b> A exercises more power than B, and A and B have independent, coexisting goals
Different power to	<b>Synergy</b> <ul style="list-style-type: none"> <li>Key players in steering group and project group complement on each other</li> <li>Market actors in the consortia enable each other to become part of MaaS</li> <li>The state and the MaaS-provider</li> </ul>	<b>Antagonism</b> A's and B's power exercises restrict, resists or disrupt one another	<b>Neutrality</b> A's and B's power exercises do not (significantly) affect one another

### 5.2.1 The transformative power of the government

When the interviewees talked about this preparation phase of the MaaS-pilot programme, they often highlighted the decisive role of the government. A policy advisor of the Amsterdam municipality said: *“At some moment the ministry decided: we are going to work with pilots. They shaped the process with the regional*

government and formed a Framework Agreement: the ROK. In this ROK you can find all the rights and obligations that the enrolled consortia needed to comply with.” (State actor Amsterdam Zuidas, interview, 2 March, 2022). The decisive role of the ministry, and the accompanying tasks of setting the rules, restrictions and requirements for MaaS, follows from the ministry’s formal position of being the initiator of the MaaS programme and therefore being the ‘principal’ of all pilots. The word ‘principal’ was used unanimously, but independently, by all interviewees to describe the governments’ role, and reflects a relationship of the government having *power over* other actors. This *power over* has a transformative nature, as it gives the government the capacity to include certain actors and therefore exclude others. Thereby, the government is able to develop a new network of actors in the mobility sector. Moreover, the requirements and rules in the Framework Agreement are new institutions about how mobility should be organised and is therefore also an example of the government exercising transformative power.

This transformative power is not only exercised by the state actor on national level. Also on a local level, the decisive interference of the municipalities was mentioned. Part of the more specific agreement for each pilot were the profile requirements, a list of properties or characteristics that market actors had to comply with in order to be a potential partner of the pilot. Although municipalities hired consultancy and engineering companies to design these profile requirements, an interviewee from one of those consultancy companies said about the government: *“Yes, I remember that there was definitely some interference on the content, if you could say it like that.”* (Market actor Amsterdam Zuidas, interview, 11 February 2022). This quote shows that the municipality was trying to interfere on a more informal level as well. This transformative power is carried out in a *power over* relationship, which becomes evident when looking at the mini-competition in Eindhoven. The mini-competition resulted in the selection of the contract partners to sign the NOK, the specific agreement following on the ROK. This selection process determined the key players for the pilots. A market actor that took part in the mini-competition in Eindhoven illustrates that the municipality had *power over* them: *“We had conversations based on our offers and the conclusion was: we won’t make the deadlines and meet all the requirements. For this reason we were excluded by the municipality of Eindhoven and ASML.”* (Market actor Eindhoven & Amsterdam Zuidas, interview, 14 March 2022). In this case, the Turnn consortium promised to comply with all the requirements set by the municipality of Eindhoven and was therefore selected over the consortium of the above mentioned Market actor. The process of including and excluding actors to participate in the MaaS-pilots shows a one-sided power dynamic between the municipality and market actors (see table 7), in which the market actors are dependent on the decisions and requirements set by the municipality.

### 5.2.2 The dominating power dynamics of cooperation and synergy

Despite the unequal power relation between government and market actors, the early phase of the pilots was described as collaborative by the interviewees. Market actors, as well as state actors and third sector actors, said that they were very willing to invest in a good relationship from the start. Especially in the beginning, there was the general feeling that different parties needed each other and were dependent on each other. Actors from both pilots mentioned the presence of a collective drive noticeable in the whole ecosystem. In Amsterdam Zuid for example, a third sector actor from a large employee organisation mentioned the willingness of the municipality to include business actors in the process: *“This time it was not – what you often see - this vague broad sentiment of ‘participation is important’. Rather it was about ‘If you want to have success, you have to hold each other’s hand’ “* (Third sector actor Amsterdam Zuidas, interview, 31 January 2022). In the pilot of Eindhoven this collective drive was linked to the connection and responsibility that actors felt towards the reputation of the Brainport region. Therefore, the foundation to work together was already there even before it was decided that Eindhoven would be a pilot area. The interviewee from Brainport Development pointed out: *“This is partly because of the fact that we as a region are very well connected. What I try to say here is that there has existed a strong culture of collaboration for years, in which everyone is willing to cooperate.”* (Third sector actor Eindhoven, interview, 9 February 2022).

The interviewees viewed the different actors in the MaaS-ecosystem as very diverse, having different perspectives and qualities. A state actor from the pilot in Eindhoven said: *“All organisations strengthen each other, because they are four totally different organisations. There is ASML with a business view, Brainport who knows the region very well, and the municipality of Eindhoven, who also knows the region and is able to look at mobility practices from a policy perspective. So I think that we have a beautiful mixture of knowledge and skills*

*to make it a success.*” (State actor Eindhoven, interview, 9 March 2022). This diverse spectrum of knowledge types is also reflected in the fact that no interviewee perceived his/her own organisation as the actor with the most expertise on MaaS. Some even said that ‘the MaaS expert’ doesn’t exist, as MaaS related expertise is the result of different types of knowledge, which no one holds all. An important reason to start collaborating is therefore to complement on each other’s different expertise and to learn from the practical experience of setting up MaaS. A strong similarity is visible here between the answers of the interviewees and the importance of learning as put forward by MaaS frame (see paragraph 4.5). Remarkable is that not only state actors mention this reason, but also market actors. A market actor explained the reason to subscribe to the pilot in Amsterdam: *“We also just want to learn and see what is happening. Of course with our expertise based on our experience in the public transport sector, but also with the expertise from other providers; shared mobility providers, consultancy and B2B”* (Market actor Eindhoven & Amsterdam Zuidas, interview, 14 March 2022).

During phase 1 there is a general consensus that collaboration is a *must* in order to make MaaS a success. Between the key players of the pilots these collective goals resulted in a formal organisational structure: on strategic level this is the steering group, and on operational level this is the project group. In Eindhoven these two groups consist of individuals from the municipality, ASML, Brainport Development, the ministry and Turnn. In Amsterdam Zuid, next to individuals from the ministry and the municipality, other members of the steering and project group are from Amaze and the Transport Region Amsterdam (in Dutch abbreviated as the VRA). The steering group and the project group consist of state, market and third sector actors and reflect two different power dynamics at the same time: Because of their focus on collaboration and the collective goals of the members, a cooperative power dynamic is visible on the one hand, while a synergetic power dynamic is reflected by different types of power that are complementary (see table 7). The key players of the steering and project group help each other, by using their power differences to empower each other. Some key actors are exercising *more power* than other key actors, such as ASML, who was sometimes exercising more innovative power than Turnn due to their access to users or money. Additionally, actors complement on each other due to their *different types of power*, for example resulting from different types of knowledge as highlighted above. These different types of power consequently have led to a synergy. The next section will illustrate the dominance of synergy and cooperation in the first phase of the pilot by describing two other power relationships that were found during the interviews.

#### *The empowering third sector*

In both pilots the MaaS providers Amaze and Turnn are empowered by the network of the third sector actors ASML, Brainport Development, the VRA and ORAM. It shows the innovative power exercise by the third sector, that is able to make this network available to the MaaS-providers. These third sector actors function as mediators and negotiators between the MaaS-provider and potential users or potential partners. Considering the differences in interests within the third sector, it can be said that some third sector actors are overlapping with the market sector and some with the state sector. However, these different interests do not seem to create a difference in power dynamic. For all third sector actors applies that they want to contribute to the expansion of the MaaS-ecosystem, and therefore they focus on empowering the MaaS provider who has the same goal. A cooperative power dynamic between the third sector actors and the MaaS provider is the result. This cooperative power dynamic is empowering the MaaS provider to exercise transformative power. After all, by developing and implementing the MaaS-app, the MaaS provider is the only one taking the responsibility of providing an integrated platform. This is a new role, not existing yet in the incumbent mobility regime. Without this integrated platform, the structure of the mobility sector and the involved travel practices would never be challenged to change. Thus, it can be said that the MaaS-provider exercises transformative power. However, in order to exercise this transformative power, they need innovative power to create a network and user base for making sure that their platform is actually being used. It is this innovative power that they lack. This lack of power is strongly reflected in the beginning of the process when they need to convince transport operators to join their app. An employee working at Amaze explains: *“It is of course a chicken-egg story. On the one hand you need users who make it attractive for transport operators to join, on the other hand you need transport operators to make it attractive for travellers to join.”* (Market actor Amsterdam Zuidas, interview, 3 March 2022).

In the pilot of Eindhoven, third sector actors ASML and Brainport Development are the ones that are empowering MaaS-provider Turnn. ASML is one of the key players in the ecosystem. ASML is part of the project group and the steering group and an active developer of the MaaS service by providing money, feedback and suggestions to Turnn. Being a big corporate organisation that has a growing amount of employees, but a limited amount of parking spots, they have the interest as a market actor to keep their campus accessible in the future. However, looking at the tasks they fulfil in the pilot programme, it is evident that they also fulfil a third sector role. The interviewee from Turnn explained this as follow: “[...] *Brainport and ASML are helping us very much.....they are not an extra sales channel, but do help us in our process by introducing us to other companies. So they are definitely strenghtening us.*” (Market actor Eindhoven, interview, 15 March 2022). The interviewee pointed to the different empowering resources of the third sector here, reflecting their innovative power: networks and size. On the one hand Brainport Development has a large network due to their intermediate position between the state and market sector by which they strongly contribute to the “*dissemination of MaaS and make sure that more people get to know MaaS and become enthusiastic about it*” (Third sector actor Eindhoven, interview, 7 February 2022), as also described by the interviewee from ASML. On the other hand it is the reputation of ASML as a big corporate that puts them in this third sector position. The interviewee from Brainport Development was explaining: “*Look, when we are talking about getting shared mobility providers on board, but they need to be pushed a bit more, then ASML is one of the first actors who will say ‘let us be involved too in the conversation, because we are talking on behalf of a potential user group of thousands of people’. Thus, their presence carries some weight.*” (Third sector actor Eindhoven, interview, 9 February 2022).

In the pilot of Amsterdam Zuid, interviewees too mentioned this empowerment by the third sector. The third sector parties are the VRA, a regional public organisation with a similar interest as the municipality of Amsterdam, and ORAM, an employee organisation representing the interests of the businesses located on the Zuidas. Both are exercising power based on their interests: The interviewee from ORAM (interview, 31 January 2022) stressed the importance of accessibility in an economically significant area like the Zuidas. And the interviewee working at VRA explicitly mentioned that their goal is “*servicing the public*” (interview, 4 February 2022). Simultaneously, they are both empowering Amaze. By facilitating the negotiations between Amaze and other stakeholders they are able to bridge between different interests in the ecosystem. This power exercise is also noticed by the MaaS provider. The interviewee from the VRA mentioned about these negotiations: “*We expected that Amaze would take a stronger position towards the public transport companies, but instead we noticed that they approached mostly us.*” (Third sector actor, Amsterdam Zuidas, interview, 4 February 2022).

It is worthwhile to mention that the empowerment by the third sector often happens in a more informal context. The participants from the third sector spoke in the first person to express that these activities are not officially part of the taskforce of their organisation, but that they are happening in between formal events based on a more personal informal relationship: “*Yes, we are calling regularly (...) and when I notice a certain sentiment in businesses, I communicate this feedback to Amaze [the MaaS provider].*” (Third sector actor, Amsterdam Zuidas, interview, 31 January 2022). It shows how powerful it is to have the right network in the MaaS-ecosystem and that the right contacts can make the difference in having *more or less* innovative power.

#### *The consortia: collaboration within the market sector*

Another relationship reflecting collaboration in the phase 1 of the pilots is the formation of the consortia. Consortia are groups of market actors that together signed up for the ROK and the NOK initiated by the ministry. They are synergetic, because they exercise different powers based on the different resources they possess. These are mainly financial resources and resources such as knowledge and skills. The resources give the individual market actors the power to create the consortium, which gives them access to a new network of actors in the MaaS-ecosystem. The creation of a consortium can therefore be seen as the creation of a new resource, namely the creation of human capital, which displays the exercise of innovative power by individual actors of the consortium. Following this statement, it can be said that the consortium itself is also exercising power that is innovative: due to its cooperative and synergetic power dynamic the consortia are able to create the operational MaaS service. This service consists of the MaaS-app provided by the MaaS-provider, the assets provided by the transport operators, and the organisational framework provided by the consultancy

organisations. The MaaS-provider is the one holding the transformative power within this consortium, by providing the necessary integrated platform (see figure 14).

Due to the commercial interest and goal of improving the service of mobility that they are collectively striving for, a cooperative power dynamic between market actors is the result. Simultaneously, a power dynamic of synergy can be determined. The synergetic power dynamic results from different types of power that enable and support each other (Avelino, 2017). Although all market actors exercise the same type of power (innovative power), that according to the POINT framework result in a cooperative power dynamic (Avelino, 2017), the effect of the market actors on each other clearly shows a synergetic power dynamic too (see table 7): They enable each other to become part of the MaaS-pilot program and to experiment with it, which would be much harder without the collaboration. Therefore they also support each other in their activities and their individual commercial goals to participate in MaaS.

#### *The MaaS-provider & State: depending on each other*

In phase 1, the government has been described as an actor exercising *power over* the market actors (see paragraph 5.2.1). This results from their formal position. Looking at their public interest, a whole other powerplay between the government and market actors becomes visible: one based on mutual dependence and synergy (see table 7). The majority of the interviewees described the ministry as the driver of the whole programme, as they are responsible for the largest financial flows and have set the initial goals for the programme. The interviewee from the consultancy company Arcadis, involved in the Amsterdam pilot said: *“What you see is that the ministry has an interest in getting [MaaS] started and that the budget is used in the right way. This is mainly the role taken by the government: creating enough pressure to accelerate the process.”* (Market actor Amsterdam Zuidas, interview, 11 February 2022). Besides the fact that this quote shows the role of the Government as a driver, the public interest of the government also reflects a power dynamic of mutual dependence between the government and its partners. In the interviews, interviewees pointed specifically to a dependence of the government on the MaaS-provider. While the MaaS-provider is getting money from the government, the government is depending on the actions of Amaze or Turnn to implement MaaS in practice. A state actor working at the Amsterdam Municipality said: *“There is a big financial dependence of course. They [the MaaS provider] are being subsidised, not only by us, but also by other investors. We are very much depending on Amaze, because we only have one pilot, so we only have each other to make this a success.”* (State actor Amsterdam Zuidas, interview 25 February 2022). Moreover, the MaaS-provider builds the digital infrastructure needed to get access to the user-data. This user-data is a crucial resource that the local and national government need in order to monitor, evaluate, and learn from the project. This is illustrated by a state actor from the municipality of Eindhoven, who explained their accessibility to the user-data as follow: *“We put this [access to user-data] in the contract with them [Turnn] from the very beginning: We want to investigate, together with you guys [Turnn], how we can learn and how our KPI's will look like.”* (State actor Eindhoven, interview, 9 March 2022). You can speak of a power relation in which the state and the MaaS-provider have *power over* each other due to their accessibility to specific resources that they need from each other, resulting in a mutual dependence.

In figure 14, the different types of power on niche level are visualised. The MaaS-provider holds both innovative and transformative power, but is also empowered by the innovative power of the third-sector. The innovative power to build the data-infrastructure, exercised by the MaaS-provider, is different from the transformative power that the government is exercising by including and excluding partners and setting the regulatory framework for MaaS. The digital infrastructure gives access to a resource, while the transformative power of the government creates a whole new organisational structure in mobility regime. However, both powers are needed to get the project started. Therefore, these different powers do not only show that the government and the MaaS-provider have *power over* each other, but also that they are *empowering* each other to reach their goals. Besides the mutual dependence, a synergy between the state actors and the MaaS-providers is therefore reflected in the first phase of the process.

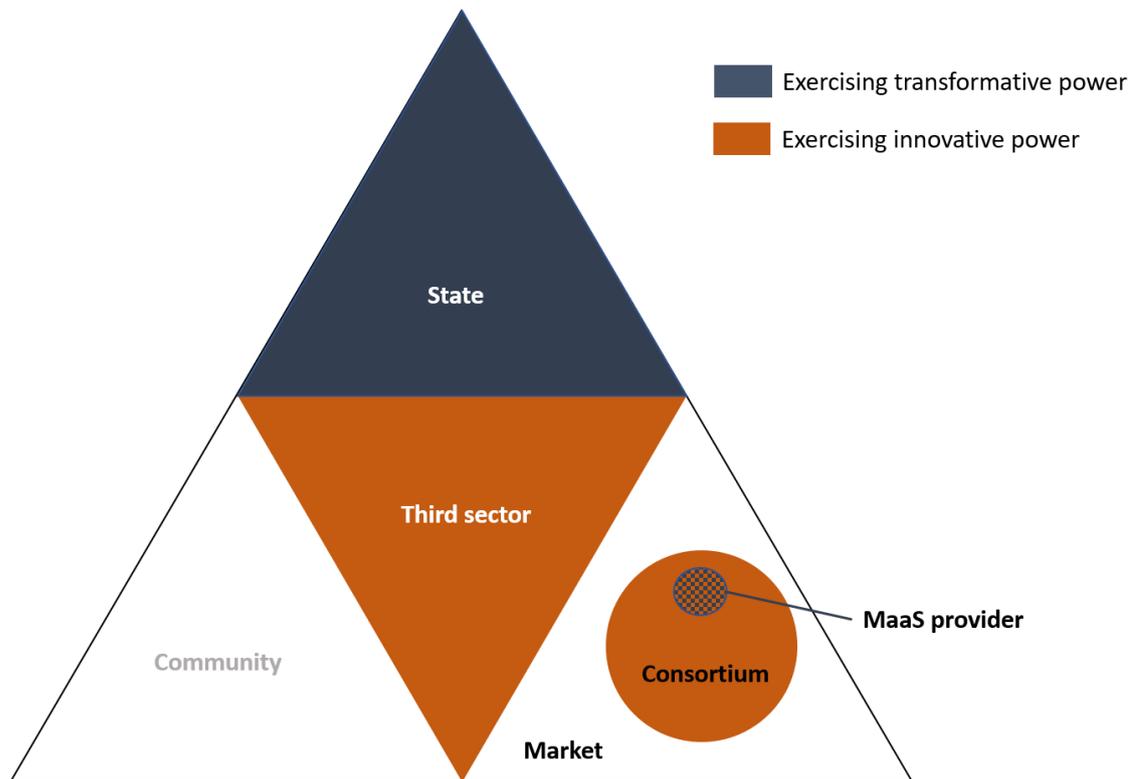


Figure 12: Power exercise on niche level, during phase 1

### 5.3 PHASE 2: Operating and implementing MaaS

The first phase of the pilot programme is about setting up the partnerships and the regulatory frameworks that are required to implement MaaS. This phase flows gradually into the next stages of the pilot, in what here is defined as phase 2. Phase 2 is characterised by the more practical and operational implementation of MaaS. An activity mentioned by interviewees and that is categorised under this second phase is for example to increase the amount of partnerships with actors beyond the key players of the pilots, such as potential user groups or shared mobility providers. Other activities in this phase and mentioned by the participants are: starting to work with the learning environment created by an external company, improving the digital infrastructure, and negotiations about prices. Starting to work with MaaS in practice had an influence on the powerplay of the MaaS-ecosystem and is therefore important to analyse as a separate phase of the programme. In order to understand the shifting powerplay, three influences on the MaaS niche are important to understand first. These are the influence of market regime actors (1), the influence of state regime structures (2), and the influence of the COVID-19 pandemic causing disruptive change (3).

#### 5.3.1 Three influences impacting the powerplay of MaaS

##### *The influence of incumbent market regime actors*

First, regime actors from the market sector that are focussed on keeping their strong market position limit further development of the MaaS niche. In the second phase it turned out that the key players of the pilots made a wrong estimation about getting the necessary transport operators on board: *“Connecting transport operators is harder than expected, and all pilots are being confronted with this challenge. We expected this to go easier, or at least that was what we hoped”* (State actor Amsterdam Zuidas, 25 February 2022). The MaaS-provider needs these regime actors in order to develop a viable business case. This was clear from the start and one of the reasons why the third sector was empowering the MaaS-providers in the phase 1 (see paragraph 5.2.2, the empowering third sector). Interviewees from market, state and third sector all saw the challenge of getting the transport operators on board. Many times this is referred to as ‘the chicken-egg story’. ‘The chicken-egg story’ is already mentioned by interviewees when they talk about phase 1, but turns out to be a real obstacle in phase 2, when MaaS is put into practice. A state actor from Amsterdam illustrated: *“I think we started with pilots that are too small, which made it not very attractive for the Felix’es and the Checks in this*

world to connect to MaaS [Felix and Check are two sharing scooter companies]. The MaaS-provider therefore can only provide a relatively limited amount of mobility options, which results in a situation that sustains itself.” (State actor Amsterdam Zuidas, interview, 2 March 2022). This one-sided dependence between transport operators and the MaaS-provider, resulted in transport operators having a wait-and-see attitude towards MaaS. The MaaS-provider is depending on a partnership with the transport operators for providing their service, but transport operators can still continue with their business without the MaaS-provider. Sometimes the transport operators even showed resistance, as experienced by a state actor in Eindhoven: “*Actually, they [transport operators] do not really want to join, so they say ‘yes’, because it is part of our requirements at the moment, but they put forward a lot of obstacles and barriers that make it practically hard to get a partnership of the ground.*” (State actor Eindhoven, interview, 9 March 2022). The reason behind this resistance are the many users that these transport operators already have. Having access to your target group gives an actor a much stronger market proposition and is therefore seen as a powerful resource by market actors. The importance of having a profitable business case results in market regime actors that prefer to offer their services on their own, instead of wanting to collaborate with the key players of the MaaS-pilots.

#### *The influence of state regime structures*

Second, the institutional lock-in of the state is disempowering the niche, as it creates significant barriers for implementation. State actors are being described by the interviewees as big, slow, and inflexible organisations. Even state actors themselves are confirming this viewpoint: “An easy example: when ASML, the municipality and the province say ‘fast’, ASML means ‘yesterday’, the municipalities mean ‘in a year’, and the province means ‘in five years’” (State actor Eindhoven, interview, 28 February 2022). The time-consuming process of the government creates a lock-in for the MaaS-actors, where the implementation of MaaS is bound to old regulations that are hard to change. A third sector actor from the VRA mentioned for example the law framework ‘people transport 2000’. The current public transport is still organised according to this framework and is in his eyes old fashioned, with “worldviews from 1995” (Third sector actor Amsterdam Zuidas, interview, 4 February 2022). Another illustrative example is mentioned by a market actor from one of the MaaS-providers. He made the comparison between the traditional organisational structure of the regional government being the principal of public transport on the one hand (see textbox 2), and the shared mobility companies, not falling under this traditional structure, on the other hand. Consequently the shared mobility companies need to go to the local government for their permits, instead of to the regional government (Market actor Amsterdam Zuidas, interview, 3 February 2022). It results in complex questions for the organisation about who is responsibility for what. Moreover, regime structures cause that experimentation can only be applied in a limited way. Due to the structure of the ROK and the NOK that both follow a traditional tender structure, parties are bound to follow the process described in the agreement. When specific circumstances required changes or improvements that deviated from the process of NOK, they could barely be implemented, due to the lock-in of these administrative rules. The traditional tender structure and the ROK and the NOK are

#### **Textbox 2**

##### *Public transport in the Netherlands: subcontracting is the standard*

To understand the processes and barriers for the organisation of the MaaS-pilots, the interviewee from the VRA (the Transport Region Amsterdam) explained how public transport in the Netherlands is organised: To give a public transport company the rights to offer mobility – a concession – the government and the public transport company sign a contract. There are two ways to arrange these concessions: 1. via tendering 2. via subcontracting. Tendering means that different parties can subscribe for the public transport rights in a region, and that the regional government decides who gets it, based on their offers. Subcontracting means that a public transport company is the first contractor of the government and thus a stable partner for offering public transport. In case of a subcontract, no competition with other public transport companies is needed, since the government will normally prolong the subcontract when it expires. This means the same public transport company has the rights to provide mobility for years. In many regions in the Netherlands public transport is organised via subcontracting, which gives the contracted mobility companies a monopoly in their area. The interviewee from the VRA mentioned some examples: “*There is a whole history behind it [...], but it means the GVB is the first contractor in Amsterdam, just like the HTM in The Hague, and the RET in Rotterdam.*” (Third sector actor Amsterdam Zuidas, interview, 4 February 2022).

therefore holding back further improvements of the process. The restricting influence of the regime is also reflected in the role of data sharing and transparency in MaaS. These two are highly valued and required for MaaS, according to the MaaS frame applied by the government (see paragraph 4.3, the requirements of MaaS). However, it seems much harder to apply this data sharing in practice, due to current privacy regulations and jurisdictional rules: “The pilots are being delayed because of Corona, but at least they are live now, while there has been barely any user-data uploaded in the learning environment. This is mainly because we are struggling on jurisdictional level with how and what we may ask as government.” (State actor Amsterdam Zuidas, interview, 2 March 2022). This actor even views the influence of traditional governmental structures as stronger than the pandemic, the final and last influence that is discussed.

#### *The influence of COVID-19*

Third, the COVID-19 pandemic as disruptive change limited further development of the MaaS niche, as it had a large influence on the mobility sector. Due to the pandemic, working from home became the new standard and commuter travelling fell back to almost zero. Especially for the pilots in Amsterdam and Eindhoven, that were both focussed on commuter and work-related travelling, this led to limited development of the niche as a whole. On the one hand this was because of the worsening economic situation for mobility companies, that during the pandemic often became dependent on government support for providing their services. Consequently, transport operators became risk averse, having less money available to invest in innovative projects like MaaS: “*And in a world with COVID, where our revenue was only 15% of our normal revenue we don’t have the financial resources to say ‘we are continuing’. That also counts for other participants.*” (Market actor Eindhoven & Amsterdam Zuidas, interview, 14 March 2022). On the other hand, no travelling means that very limited user data could be generated. User-data is required in order to learn from the pilots, which is also reflected in this comment from a state actor from Eindhoven: “*From a sustainability perspective it is wonderful that people are travelling less, but for the MaaS-pilot and the success of the testing phase, it would be nice if more people start travelling again*” (State actor Eindhoven, interview, 9 March 2022).

#### *Summary*

The analysis above shows that the niche is disempowered, partly by regime structures, partly by the impact of the unexpected event of the COVID-19 pandemic. Market actors active on regime level are reproducing their powerful market position by exercising reinforcing power towards the niche. Additionally, regime structures originating from the state sector have created a lock-in situation that disempowers the niche from further development. These two influences are visualised in figure 15. The disruptive change caused by the COVID-19 pandemic adds even more challenges for niche development. Consequently, the niche becomes less powerful and less able to challenge the regime in this second phase. The pandemic slowed down the pilots and makes the future of MaaS in the Netherlands uncertain. This gives certain regime players the chance to step in and to become more dominant. Although the powerplay focussed on collaboration still continues – there is after all no black/white division between phase 1 and 2 - other powerplays, focussed on competition and resistance, start to become more visible and dominant, and influence therefore the niche-regime interaction. In the next sections these are analysed more deeply.

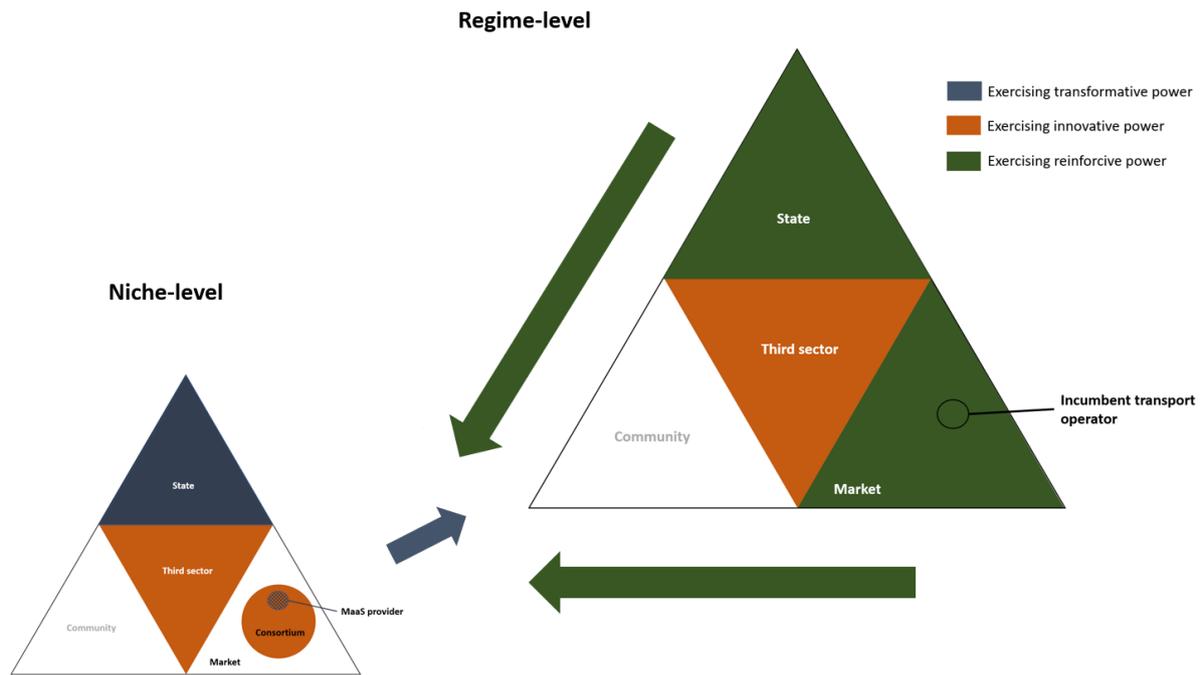


Figure 13: Reinforce power of the regime pressing towards the transformative power of the niche

### 5.3.2 Shifting power dynamics

The disempowerment of the niche, happening in phase 2, goes together with a powershift: a shift from the state sector as dominant powerful actor group to the market sector as dominant actor group, with consequently less influence of the state in the MaaS-ecosystem. This is partly because of powerful market actors stepping into the MaaS niche, and partly because the MaaS frame by the government becomes less influential. More contradictive power dynamics are a consequence, such as an antagonistic power dynamic and competitive power dynamics (see table 8).

Table 8: Power dynamics important during the implementation of the pilots

Power relations		Power dynamics	
Power over	<p><b>Mutual dependence</b></p> <p>State depends on MaaS-provider, but MaaS provider also depends on State</p>	<p><b>One sided dependence</b></p> <p>MaaS-provider depend on powerful transport operators (including NS), but powerful transport operators (including NS) do not depend on the MaaS-provider</p>	<p><b>Independence</b></p> <p>A and B do not depend on each other, they have no power over each other</p>
More/ less power to	<p><b>Cooperation</b></p> <ul style="list-style-type: none"> <li>Key players in steering group and project group help each other</li> <li>Third sector exercises more power than MaaS-provider, but third sector and the MaaS-provider have similar, collective goals</li> <li>Market actors in consortia have similar goals</li> </ul>	<p><b>Competition</b></p> <p>Between different MaaS-initiatives, developed by MaaS-provider and transport operators, like shared mobility providers and public transport.</p>	<p><b>Co – existence</b></p> <p>A exercises more power than B, and A and B have independent, coexisting goals</p>
Different power to	<p><b>Synergy</b></p> <ul style="list-style-type: none"> <li>Key players in steering group and project group complement on each other</li> <li>Market actors in the consortia enable each other to become part of MaaS</li> <li>The state and the MaaS-provider</li> <li>MaaS-provider collaborates with less powerful transport operator</li> </ul>	<p><b>Antagonism</b></p> <p>'State - Public transport relationship' restricts 'State - MaaS-provider relationship'</p>	<p><b>Neutrality</b></p> <p>A's and B's power exercises do not (significantly) affect one another</p>

### *Declining state influence*

In the operational phase of the MaaS-pilots in Eindhoven and Amsterdam Zuid, the MaaS niche is disempowered and the niche-regime interaction changes. During phase 1 a general feeling of collaboration was dominating and together with the optimistic MaaS-frame of the government, this resulted in positive thinking among actors. Putting MaaS in practice, phase 2 comes along with more sceptic thinking. Opinions about the innovativeness of MaaS differ between the interviewees and seems to be independent from sector. Whereas one participant finds that the goals of MaaS are not very new compared to the goals we have tried to achieve with other mobility innovations (Market actor Amsterdam Zuidas, interview, 11 February 2022), another one thinks the concept is still too innovative and new to receive a broad understanding from the mobility sector (State actor Amsterdam Zuidas, interview, 25 February 2022). These different opinions reflect a differentiated and more uncertain view on MaaS, compared to the common drive to make it a success reflected in phase 1. The MaaS-frame of the government clearly has become less influential.

A decreasing role for state actors becomes also visible when comparing their role with the role of the third sector. Part of the powerplay in phase 1 continues in phase 2, of which the most clear one is the power exercise by the third sector actors, who are still trying to empower the MaaS-provider. An example of this continuing empowerment is ASML, who is pressuring bus providers to join the Turnn app: *“ASML put pressure on the bus providers and told them: ‘if you don’t cooperate, than we will choose another way of travelling and you won’t sell your tickets to us.’”* (Market actor Eindhoven, interview, 9 March 2022). The interviews do not reflect a changing role for these actors when moving to the operational phase of the pilot-programme. The interviewee from Brainport Development admits that their role is therefore limited: *“At the same time, we are very aware that, by being a development organisation we can advise, but we can’t force. There are limits in what we can do.”* (Third sector actor Eindhoven, interview, 9 February 2022). Comparing state actors with the third sector actors, the state actors too have an empowering role, but according to many interviewees, they are not that limited in resources. By being the grantor of public transport concessions they are in the position to exercise *power over* the transport operators and force them to implement MaaS requirements, such as to start working with specific technical standards: *“Nowadays, integration of the TOM-API [a technical standard] is required for handing out concessions”* the interviewee from Amaze explained (interview, 3 February 2022). By these kind of actions the state is empowering the MaaS-provider in their transformative power, just like the third sector. However, despite having this formal *power over*, many interviewees criticise the government for not doing enough to cope with the strong power of an important regime actor: the NS. The NS is the official Dutch train organisation that is formally controlled by the government, which is a result of the regime structure of how public transport is organised in the Netherlands (see textbox 2). However, according to some interviewees, this structure has led to a monopoly position of the NS and the governmental *power over* the NS seems therefore rather limited in practice: *“They [the government] have very limited power to force something in the market. I think the ministry should first make sure that the NS opens up their ticket provision. They [the government] are still failing on this.”* (Market actor Eindhoven, interview, 15 March 2022). The MaaS-provider pointed here to the unequal offerings that NS is doing towards their own customers, compared to the MaaS customers. A state actor from Amsterdam illustrated this: *“An example is ABN [Amro, a Dutch bank], they have an extremely beneficial deal with the NS. I think they can offer their employees unlimited travelling with public transport for 200 euro’s a person: first class, second class, private and business relate travel. A MaaS-provider will never be able to compete with this offer.”* (State actor Amsterdam Zuidas, interview, 25 February 2022). Although the government and municipalities are trying to change this situation by creating a similar kind of offer in Amaze or Turnn (called a ‘reference offer’), this seems very hard due to the one-sided dependence between the NS and the MaaS-provider (see table 8): The NS is not dependent on a MaaS-provider for reaching customers and selling their mobility services, while the MaaS-provider is very dependent on including the NS in their app in order to make MaaS attractive for potential users.

The concessions given by the government keep the NS in a monopoly position and due to the institutional lock-in of the government mentioned earlier (see paragraph 5.3.1), the organisation behind these concessions is hard to change. The state and the NS together are therefore exercising reinforce power, due to their organisational structure. This is particularly interesting, realising that the state is also empowering the MaaS-provider to exercise transformative power. This contradiction results in an antagonistic power dynamic between the reinforce power of the NS and the state, and the transformative of the MaaS-provider and the

state. The declining state influence in the niche makes that state actors are struggling with their different power exercises and how to cope with the different actors on both niche and regime level. A state actor from Amsterdam is concluding: *“The NS is a very important party. You need them, but they can also be in the way.”* (State actor Amsterdam Zuidas, interview, 25 February 2022).

#### *Shifting dominance from state to market*

In the second phase, incumbent market actors show more interest in the niche innovation of MaaS and are willing to move along into the mobility transition. This trend is mentioned a few times by different interviewees, for example by an interviewee of one of the consultancy companies in the pilot in Amsterdam: *“The market structure - the way parties offer their products - is shaken up, because you can not simply just do your own thing anymore. Then you are perceived as, yeah, old-fashioned. So I think at least that the development of the pilots have achieved that.”* (Market actor Amsterdam Zuidas, interview, 11 February 2022). In phase 1 a clear line between the regime and a niche is visible: the MaaS frame is put forward by the government and followed-up by niche actors such as Amaze and Turnn, and clearly shows what is new and challenging about MaaS. With an increasing interest from incumbent market actors in MaaS, it can be said that the niche challenged the regime successfully. The clear line between niche and regime, however, becomes blurred due to this, because incumbent market regime actors are stepping into the niche now. As a result more competition for the MaaS provider is created: Incumbent market actors are starting to develop their own MaaS initiative. This can be seen as a general trend, as different interviewees mention different parties that are doing this. Both MaaS-provider and incumbent market actors have the transformative power to start their own MaaS initiative and are therefore competing. A state actor from the province of Brabant mentioned: *“I think it was Arriva who worked together with Turnn, but eventually they started to develop a MaaS-app on their own. So yeah, I think they are positive towards the initiative, but just want to do it in their own way. The question will be how all those different apps will work out next to each other.”* (State actor Eindhoven, interview, 28 February 2022). Instead of cooperating, incumbent mobility companies choose to compete. It reflects the economic regime structure that was already explained in paragraph 5.3.1 (the influence of incumbent market regime actors). Niche actors are experimenting with ways to cope with this influence coming from regime actors, which becomes clear in the pilot of Eindhoven, where Turnn is experimenting with other ways to sell its product. Turnn is selling white labels of their MaaS-app to other mobility companies that do not have the expertise, money and/or capacity to build one of their own. These companies do not have the transformative power that Turnn has, but do have the innovative power to get a party like Turnn mobilised for them (see figure 16). Due to the regime structure of subcontracts and concessions (see textbox 2), these mobility companies have the right to provide mobility in a certain geographical area. They are not as big as the NS and are not included in the pilot areas, but do want to offer MaaS to their customers. The interviewee of Turnn explained their relationship with those companies: *“They are an extension of our sales channel. When I see a potential client in Dordrecht for example, but our busy schedule does not allow us to go there at the moment, then I can call Qbus, since they have the concession there. We can then approach this potential client together.”* (Market actor Eindhoven, interview, 15 March 2022). By offering their MaaS-app as a white label, Turnn is able to create a synergetic power dynamic instead of a competitive power dynamic with some of the transport operators. Moreover, Turnn expresses here that their white labels are also a strategy to make transport operators willing to start with MaaS. Instead of experiencing resistance from incumbent market actors, who are not always willing to cooperate with a MaaS-provider as they are afraid to lose their market position, they are now working together: *“We are also trying to approach shared mobility providers together to convince them to join our platform. After all, you are stronger with more market parties.”* (Market actor Eindhoven, interview, 15 March 2022). The amount of transformative power is crucial here: in case a transport operator has enough transformative power of their own it result in a competing power dynamic with the MaaS-provider. In case a transport operator lacks this transformative power it can lead to a synergetic power dynamic (see table 8).

In figure 16, the market regime actors and their different types of power on niche level are visualised. There is one actor that is returning remarkably often, who is therefore visualised separately from the other market actors: the NS. The NS is a regime actor that has started their own MaaS initiative called River. River is not perceived by all actors as something positive. They see River as a threat for the level-playing field of MaaS: *“I am not against River, as long as you create a level-playing field, I think it is our job to develop a better app and*

proposition. But it is the task of the government to make sure all public transport cards and subscriptions are available for everyone. That means: available for us and for our competitors.” (Market actor Eindhoven, interview, 15 March 2022). Thanks to their strong market position, their access to customers, and the possession of assets, the NS and his partners have much more transformative power than the MaaS-provider, who is dependent on other parties for accessing these resources. A third sector actor from the VRA illustrated his view on River: “You should interpret River as ‘we are going to create this market and everyone can join us’. And of course other parties indeed join them, since the parties behind River possess 80% of the travel market.” (Third sector actor Amsterdam Zuidas, interview, 4 February 2022). The rise of River makes the niche-regime interaction, and therefore the transition as a whole, less state-dependent. This shift is characterizing phase two of the pilot programme: there is only a minor role for the ministry. Although they are still monitoring the pilot and are present in the back, many interviewees point to their limited influence. Some interviewees expected that the government, just like in the first phase, would take a more leading role, as also this quote by a market actor show: “Looking back at it I think the ministry should have said: ‘we are going to sit together and find a solution’, but instead they just said: ‘No, you are contract partners now, so goodluck’” (Market actor Eindhoven & Amsterdam Zuidas, interview, 14 March 2022).

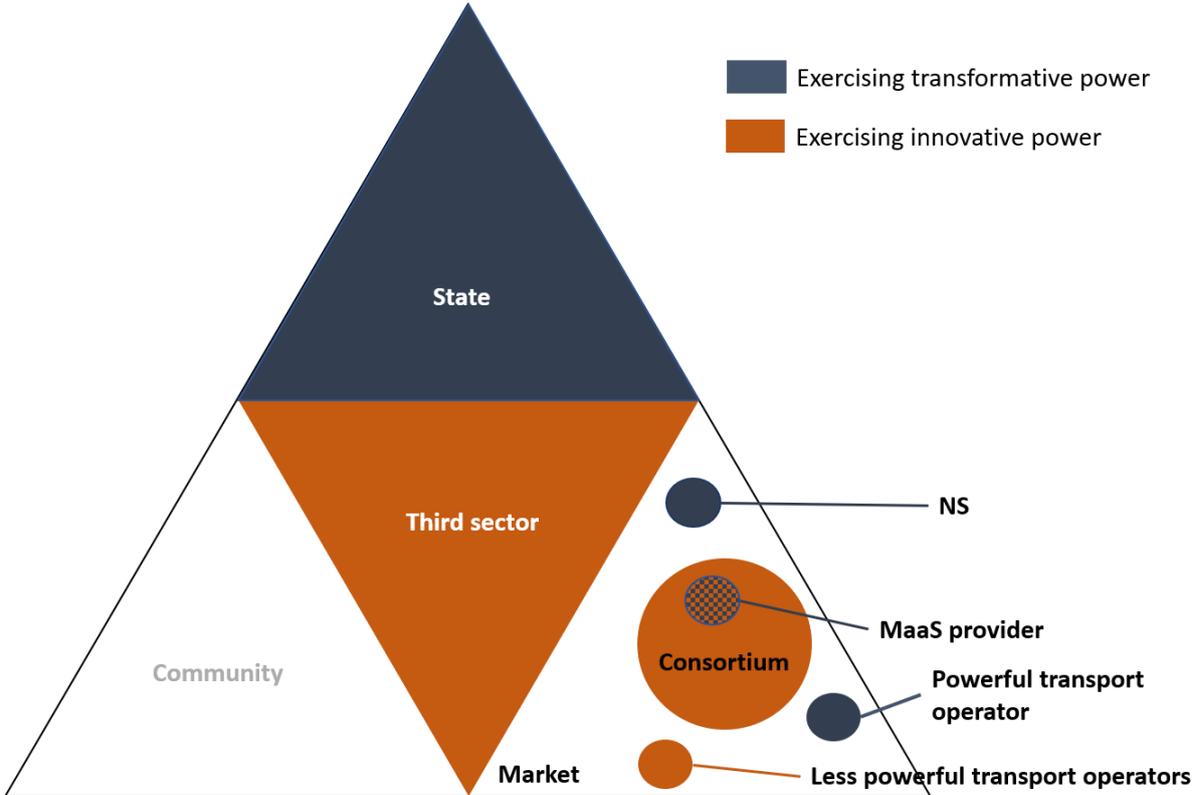


Figure 14: Market regime actors stepping into the MaaS niche and exercising innovative and transformative power

## 5.4 PHASE 3: Predictions about the future of MaaS

Despite the shift to more competition and less collaboration, and the niche actors becoming less powerful compared to upcoming incumbent market actors in the MaaS niche, the niche is still challenging the regime. After all, the idea and concept of MaaS is slowly getting more acceptance by regime actors. This means the mobility transition will likely happen and gradually continue. The way this transition continues will be determined by the powerplay, as this will determine what actors become important in the future. When asked about the future of MaaS, the respondents' expectations revealed some remarkable shared understandings. Table 9 shows the power dynamics that can be expected as an addition to the power dynamics from phase 2.

Table 9: Power dynamics that can be expected to be important after finishing the pilots

Power relations	Power dynamics		
Power over	<b>No Mutual dependence</b> State depends on MaaS-provider, but MaaS provider also depends on State	<b>One sided dependence</b> MaaS-provider depend on powerful transport operators (including NS), but powerful transport operators (including NS) do not depend on the MaaS-provider	<b>Independence</b> A and B do not depend on each other, they have no power over each other
More/ less power to	<b>Cooperation</b> <ul style="list-style-type: none"> <li>Key players in steering group and project group</li> <li>Third sector exercises more power than MaaS-provider, but third sector and the MaaS-provider have similar, collective goals</li> <li>The consortia</li> </ul>	<b>Competition</b> Between different MaaS-initiatives, developed by MaaS-provider and transport operators, like shared mobility providers and public transport (and big tech?)	<b>Co – existence?</b> MaaS provider A exercises more power than MaaS provider B, and A and B have independent, coexisting goals
Different power to	<b>Synergy</b> <ul style="list-style-type: none"> <li>Key players in steering group and project group</li> <li>The consortia</li> <li>The state and the MaaS-provider</li> <li>MaaS-provider and less powerful transport operator</li> </ul>	<b>Antagonism</b> 'State - Public transport relationship' restricts 'State - MaaS-provider relationship'	<b>Neutrality</b> A's and B's power exercises do not (significantly) affect one another

First of all, many respondents expected that when the pilots will end, the government will become immediately less powerful, as their formal position of principal end simultaneously. Also, their access to the user-data will be blocked. This is pointed out by state actors as well as by market actors. A state actor from the municipality of Amsterdam said: *"When they [Amaze] are completely independent from us, they are not obliged to share their data anymore. That data is very valuable for them so I don't expect that it will happen that they keep sharing it voluntarily."* (State actor Amsterdam Zuidas, interview, 25 February 2022). Another state actor even mentioned that a change in law would be necessary if the municipality wants to keep monitoring.

Knowing that the pilot will come to an end at the end of 2022, a lot of interviewees mention the competition between the different MaaS-providers on national level. With government support ending, it means that the seven MaaS-providers (resulting from the seven pilots) need to compete with each other, plus all the other upcoming MaaS initiatives in the market. Participants have different opinions on this. Some are very sceptical about the chances of the MaaS-providers to survive: *"People mainly said: 'we are going to learn a lot, and by involving different parties we hope to create a level-playing field'. While now you see that we created relatively weak parties, simply because it turned out that creating a good business case is very difficult"* (State actor Amsterdam Zuidas, interview, 2 March 2022). Others believe that the change of looking at mobility differently will convince enough future clients and users to let the MaaS-providers survive: *"Of course, you need to show a certain consistence on the longer term. I think that the parties that are still existing, have proved that they can do this. And the awareness of wanting to go to that one solution is growing (...). More and more companies are switching to a mobility budget."* (Market actor Amsterdam Zuidas, interview, 3 February 2022). Additionally, some interviewees do not only expect competition, but also a co-existing power dynamic (see table 9). The pilots have been started with very different goals which could lead, according to a state actor from Eindhoven, to a range of more specific MaaS services that have independent coexisting goals: *"I think there is room for*

*different MaaS-providers, because I don't believe in an app that is excellent in everything. For employees, for example, you need a different app than for private use, or for disabled citizens.”* (State actor Eindhoven, interview, 9 March 2022).

Another returning pattern is the expectation of other market actors stepping into the MaaS-ecosystem: *“Eventually there will be new parties entering the MaaS market. For example the NS, the biggest one, who has already their own app Rivier behind them. Well, it is just a matter of time before Google will start to involve in this domain too”* (Market actor Eindhoven & Amsterdam Zuidas, 14 March 2022). This participant, working at one of the transport operators, points at two future important market actors: Big tech companies and big public transport organisations. These two are mentioned by other actors as well and might have more power than the other transport operators active in the MaaS-ecosystem, considering their strong market position. This could lead to a competitive power dynamic in which the big tech companies will have transformative power to set up MaaS on their own, whereas the MaaS-provider in the pilots is depending on the empowerment by other actors for exercising this transformative power. Considering their commercial interest, market actors view this as threatening. When talking about the future challenges, they therefore see preventing market inequality as an important challenge that needs to be tackled. Consequently, they view an important future role for the government in *“creating a commercial level-playing field”* (Market actor Eindhoven, interview, 15 March 2022) as pointed out by an interviewee working at one of the MaaS-providers. This role is also acknowledged by state actors themselves: *“What will stay very important is that the ministry needs to guarantee an equal playing field and transparency behind the processes of a MaaS-app and the pricing.”* (Third sector actor Eindhoven, interview, 7 February 2022). In contrast to the market actors, state actors view this future competitive power dynamic caused by big public transport companies not necessarily as threatening. For them it is important that MaaS is continuing, but not what transport company it is implementing it. It is unlikely that this development puts their public interest in danger. Looking at the involvement of the big tech companies, state actors are more worried. An interviewee from the municipality of Amsterdam said about the entering of big tech companies: *“The question is, can the parties that we have supported - or other parties – offer serious competition? I hope so. The next question is, how bad is it that Google will be involved? If they are acting within the lines [...], then it might all be fine. However, we don't know this yet.”* (State actor Amsterdam Zuidas, interview, 2 March 2022). The insecurity about how big tech companies might influence the market also makes the role of state actors in the mobility transition very uncertain for the future.

Additionally, the impact of Covid-19 on the mobility sector is still highly uncertain. The interviews showed that the pandemic caused disruptive change in the transition on at least the short term. Whether it will also have a long term effect, and if so, how will it influence the MaaS-ecosystem and our travel practices, are questions raised by different interviewees. Some think the amount of travellers will go back to post-covid times (State actor Amsterdam Zuidas, interview, 25 February 2022), some are convinced it has changed our view on mobility for good (Market actor Amsterdam Zuidas, interview, 11 February 2022). Others question the impact of Covid-19 on the future success of the pilot because *“the world would have looked totally different without covid”* as mentioned by one of the market actors (Market actor Eindhoven & Amsterdam Zuidas, interview, 14 March 2022).

## 5.5 Summary & conclusion

This chapter described the powerplay of the MaaS-ecosystem by analysing the MaaS-pilot in Eindhoven and the MaaS-pilot at the Amsterdam Zuidas and defining three phases of the pilot. The three phases show that the MaaS-ecosystem is dominated by cooperative and synergetic power dynamics at the beginning, and that when the pilots are put into practice power dynamics focussed on competition are becoming more dominant. In the first phase of the pilot the MaaS-frame put forward by the government is strongly visible in all actor groups. The willingness to cooperate and the drive to make something out of it result in mainly cooperative and synergetic power dynamics between state, market and third sector actors in the MaaS niche. By giving access to their network, the innovative power of third sector actors is enabling the MaaS provider. Thereby, the MaaS provider is empowered to exercise their transformative power of challenging the regime by developing and implementing the MaaS-service. The government is exercising transformative power too, partly by putting their

MaaS frame out, that presents a new way of mobility thinking, and partly because their formal role of the principal of the pilots allows them to change networks and rules. The dominant presence of state actors is also reflected by the mutual dependence between them and the MaaS-providers, which creates a strong relationship between the state and the MaaS-provider and helps the niche as a whole to exercise transformative power towards the regime. The dominance of state actors is shifting in the second phase of the pilot, when the regime becomes more oppressing towards the MaaS niche. During the implementation phase incumbent market actors start playing a more prominent role by stepping into the MaaS niche. Not only because the niche challenged the regime successfully and incumbent market regime actors show more interest in MaaS, but also because the niche becomes less powerful in exercising its transformative power. Incumbent market actors are defending their powerful market position by competing with the MaaS providers, and regime structures put the state in a lock-in situation, which creates barriers for further development of the niche. Despite the successful transformative power exercise of the MaaS niche in the first phase, this shift to a dominance of market actors shows the reinforcing power of regime towards the MaaS niche in the second phase. Additionally, the traditional relationship between the state and the NS, which can be seen as a regime element, displays an antagonistic power dynamic with the relationship between the state and the MaaS-provider, which can be seen as a niche element. It shows again the reinforcing power of the regime towards the niche.

How the future of the MaaS-ecosystem will look like in practice is highly uncertain and time passing by will reveal whether the expectations of the different actors will become reality. The shared understandings about the ending role of the government in the pilots and big tech companies stepping into the MaaS niche, show that competitive power dynamics are very much likely to be present in the future MaaS-ecosystem. The cooperative and synergetic power dynamics that are present mainly in phase 1, and partly in phase 2, are partially resulting from the discursive framing by the government. Using this frame shows an transformative power exercise and when the pilots end, this power exercise will be much harder to continue for the government. The competition that is expected to result from big tech companies and powerful public transport organisations stepping into the MaaS-ecosystem, increases the chance for competitive power dynamics to overrule the cooperative and synergetic dynamics. However, this is highly uncertain, since the future role of the government and the long-term impact of the pandemic might also influence the future powerplay of the MaaS-ecosystem.

## 6. The relevance of studying power in MaaS

This research examined the politics of niche-regime interaction between MaaS and the mobility regime in the Netherlands. It explored how discursive frames are used by the Dutch government to shape the MaaS niche, and tried to understand how power relations present in the Dutch MaaS-ecosystem shape the transition to sustainable urban mobility. In this chapter a critical reflection is made on the findings of this research in the broader light of existing scientific literature. A link will be drawn to the two propositions made in the introduction of this thesis. After all, those propositions were the direct motivation for conducting this research and reflecting on them adds a critical perspective to the more descriptive results. Moreover, the theoretical frameworks used for answering the sub research questions are evaluated and discussed. Finally, a reflection on the limitations of this study is provided, followed up by some recommendations for future research.

### 6.1 Critical reflection on sustainability in the MaaS-frame

By taking a socio-political approach this research did not strive to find out whether MaaS is a sustainable innovation or not, rather this thesis tried to develop a critical understanding about MaaS and its connection to sustainability by looking at the discursive framing of MaaS. In the introductory chapter the following proposition was made:

*There is a need to develop a critical understanding of the value of MaaS as part of the sustainability transition to sustainable urban mobility*

In the MaaS frame applied by the government, MaaS is presented as part of a broader transition in society that will change the way we use and think about mobility and that is closely related to digitalization and sustainability. However, the meaning of the word 'sustainability' is never specified in the documents and the word 'transition' is barely used at all. The findings of this thesis reflected that the government is describing rather a *digital mobility transition*, instead of a *sustainable urban mobility transition*. This is remarkable, since transition management was originally presented by the Dutch Government as a strategy to stimulate sustainable development in order to deal with environmental degradation (Loorbach et al., 2017). It seems like the Dutch government applies the digital mobility transition as a 'boundary concept' (Avelino, 2007). A 'boundary concept' is "a discursive device that blurs boundaries and thereby aligns, or at least transcends, different and possible conflicting discourses and practices" (Avelino, 2007, p. 16). Applying a transition as a 'boundary concept' in policy results in a very limited use or specification of the words 'sustainability' and 'transition' in policy documents. Avelino (2007) even found that in officially adopted Dutch policy documents on the transition to sustainable mobility, these words were not mentioned at all. In the next section it is argued that by using the digital mobility transition as a 'boundary concept' the value of MaaS for the sustainable urban mobility transition is at risk.

The current findings showed that the term sustainability is present in the documents about MaaS, but very limited and only part of presenting MaaS as the win-win for all. MaaS is presented as innovation that offers many different stakeholders learning, economic and sustainable opportunities. This was also found in earlier research by Pangbourne et al. (2018) who studied the rhetoric of MaaS in three countries - among them the Netherlands – and found that the dominant MaaS rhetoric is highly optimistic and might even promote false promises. According to Blythe et al. (2018) this optimistic approach neglects the important role of power and politics in the transformation to a more sustainable society. Simply assuming that MaaS will be sustainable because it is innovative, is ignoring questions about what is needed to put this sustainability into practice and what we see as sustainable. In the digital mobility transition, the Dutch government assumes sustainability as an output of MaaS: Sustainability is something that logically follows from the innovative MaaS approach. The concept is never made explicit, by for example defining specific sustainability goals about emission reductions or private-car use. Simultaneously, economic growth is a crucial part of the MaaS-frame, by mentioning the requirement of creating a viable business case for MaaS, and highlighting its business opportunities. There is therefore a risk that the MaaS-frame might be used to justify business-as-usual (Blythe, 2018) and thus, that the contribution of MaaS for the sustainable urban mobility transition is ignored or overlooked by policy makers. Indeed, a growing amount of literature is criticising the dominant discourse in environmental policy focussing on 'green growth' (e.g. Sandberg, Klockars, Wilén, 2019; Friant, Vermeulen & Salomone, 2020;

Meriono-Saum et al., 2020). These scientists argue that the discourse focussing on 'green growth' fails to acknowledge or prioritize the core challenges of creating a sustainable future. By applying the digital mobility transition as a 'boundary concept', the MaaS frame could have similar effects and could distract politicians from the reason why MaaS has been initiated: MaaS, in the end, is not a goal on itself, but a mean to provide better transport and to cope with the environmental and urban problems of transport (Ministry of I&W, 2021).

The co-founders of the transition framework argue that by using the transition concept as a 'boundary concept' it becomes possible to align different interests. Therefore, a 'boundary concept' is able to make often conflicting topics, such as sustainability, more accessible for all kinds of actors (Loorbach, 2007; Rotmans and Kemp, 2008; Kemp and Rotmans, 2009). Although a 'boundary concept' can unite actors on the topic of sustainability, this might not be sufficient to address the current environmental problems. Recent scientific findings published in the latest IPCC report (Shukla et al., 2022) point to the dangers and risks on our environment that we are facing as we speak. Based on all of the above, it is therefore argued that specifying the meaning of sustainability and putting it at the core of the MaaS frame is important to force state, market and third sector actors to assess the MaaS implementation more critical. After all, the effect of MaaS on sustainability is still highly questionable (Arias-Molinares & Garcia-Palomares, 2020; Sochor et al., 2018; Smith, Sochor & Karlsson, 2019) and a critical viewpoint is needed to guarantee that MaaS will be a real contributor to mitigate climate change in the near future.

Critics could argue that the use of the word 'transition' and 'sustainability' in theoretical documents do not say anything about how much MaaS is contributing to a more sustainable society in practice. Nonetheless, the impact of frames on our reality, and thus actual change, should not be underestimated. This study displays how a discursive frame helps to legitimize the role of the national government. How power is exercised by using frames is also shown by Bosman et al. (2014), who studied discursive regime dynamics in the Dutch energy transition. With their case study, they showed how new storylines from incumbent regime actors can cause discursive regime destabilization by challenging the dominant discourse. Consequently this can lead to different power relations in the regime and eventually to an acceleration of the transition (Bosman et al., 2014). This implicates that when the government as incumbent regime actor is able to create a strong storyline on sustainability in MaaS, the sustainable urban mobility transition could be fostered. Being such a powerful actor, they could play an important role in increasing the value of MaaS for the sustainable urban mobility transition.

## 6.2 The MaaS-frame: overlapping with both the radical and the technocratic transition as discourse

We have seen that the MaaS-frame applied by the Dutch government consists of three discursive statements that together present the Dutch MaaS approach as an innovative and collaborative initiative. The analysis showed that in practice this discursive framing by the government was most strongly present in the first phase of the pilot programme, which was reflected in a powerful role for the government as principal and facilitator of the pilots. The 'transition as discourse' proved to be a valuable framework for investigating the discursive framing of MaaS. Applying the transition as discourse on the MaaS-frame helped to see the MaaS frame in the light of the broader digital mobility transition, despite this transition was mentioned in only a very limited way in the policy documents. Recognizing elements from the technocratic and the radical transition frame in the MaaS-frame was helpful to get an understanding about how the government views the mobility transition in general. It became clear that the MaaS-frame reflected discursive statements from mostly the technocratic transition frame: the government highlights economic growth by emphasizing MaaS as a business case, and describes themselves as key driver that is protecting the civil society. This implies that the discourse of sustainable urban mobility is mainly framed as technocratic and is in line with what Audet (2016) concluded earlier: that is, that currently the technocratic frame is the most appealing frame in environmental policymaking. The results presented in this study therefore show the presence of the different discursive statements of the technocratic transition on national scale, as an addition to the global scale of environmental policymaking that was analysed by Audet (2016). Furthermore, these findings provide a practical example of how different frame elements from both the radical and the technocratic transition frame impact the MaaS powerplay, by applying it on an the empirical case of the Netherlands. Thereby, it proofed the relevance of

studying 'transition as discourse' for analysing power in mobility transitions. These practical insights can be used to also understand the impact of transition discourses on other Dutch transitions, such as the Dutch energy transition or the sustainable food transition. Finally, with scientists calling for more government interference on MaaS on both national (Vij & Dühr, 2022) and local level (Fenton, Chimenti & Kanda, 2020), it is likely that the technocratic discourse on MaaS will become more influential in other European countries as well. Having the example of the Dutch MaaS-frame will help to faster recognize the impact of other possible MaaS-frames applied by governments abroad.

Important to mention is that the dominance of the technocratic transition frame should not be interpreted as a black and white case. Part of the MaaS-frame was the acceptance of complexity as part of the transition. Complexity is seen by the government as inevitable due to the many different interest in the transition and in MaaS. This clearly reflects the discursive element of the radical transition frame that complexity is inherent to a transition. Rather than that viewing complexity as a technocratic problem that needs to be solved by technocratic solutions, it is accepted as part of the process. It implicates that there is no clear duality between the radical and technocratic transition frame, but rather that the discursive statements form a continuum for other transition frames either being more radical or more technocratic. Audet (2016) himself already acknowledged that the two transition discourses know blurred aspects, notifying that one actor can apply both frames. However, he mentions a clear duality between both frames by arguing that the dichotomy is often the source for discursive conflicts in environmental policy making (Audet, 2016). Based on the findings of this study, it is argued that when actors are applying both frames, they are not switching between one or the other, but they are creating different, overlapping, frames. These frames are resulting from a combination of elements from both transition frames. Rather than presenting the radical and the technocratic transition frame as a dichotomy, presenting them as a continuum creates the possibility for researchers to see plenty new variations of transition discourses. The MaaS-frame shows for example a variation of the technocratic transition frame in which complexity is integrated and acknowledged. A combination of the radical and technocratic transition frame does not have to cause discursive conflict, but can also exist coherently in a new transition frame. Presenting both frames as done in figure 17. offers a new perspective on the application of 'transition as discourse'. This is a great contribution for studying the discourses of transitions, as it allows researchers to study discourses from a more nuanced view that is able to capture a higher level of complexity of discourses.

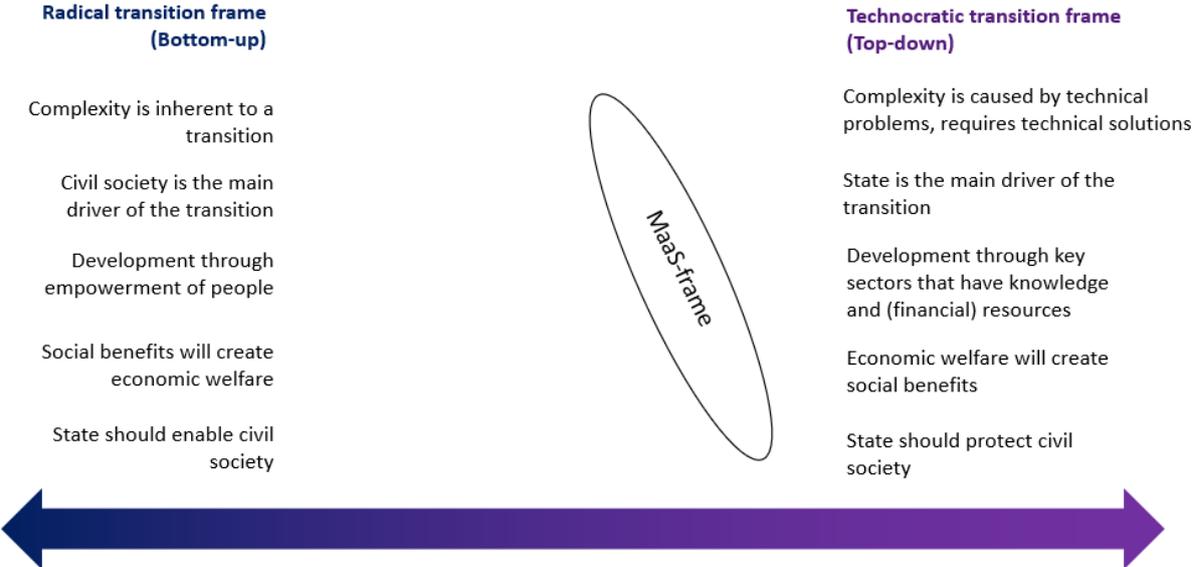


Figure 15: A continuum of the radical transition frame and the technocratic transition frame

### 6.3 Critical reflection on the future role of the government in MaaS

In the introductory chapter it was noted that analysing power relationships would provide insights about the roles and responsibilities of actors in the MaaS-ecosystem. The following proposition was made:

*There is a need to analyse the power relationships between the stakeholders of the MaaS-ecosystem, in order to get a deeper understanding of how roles and responsibilities are shaped by these power relations.*

Although it is interesting to look at the role and responsibility of each MaaS-ecosystem player individually, there is one actor that is particularly interesting considering their involvement in the shifting power dynamic from state to market: the national Government. When it comes to MaaS, the government is having responsibility on both niche and regime level and struggles with governing the nice actors as well as some incumbent regime actors, like the NS. By creating the MaaS frame the government shows that it wants to take a leading and guiding role. However, when looking at the future role of the government, this role seems at risk. The findings of this thesis reflect a decreasing state influence present in the MaaS niche. This adds on the findings of Kern & Smith (2008) who studied the Dutch energy transition. They state that Dutch transition policy might be very ambitious and innovative, however, it does not guarantee enough power to foster structural change due to the dominance of regime actors who are undermining the original policy ambition. They argue that transition debates have therefore been too optimistic about the role of the government. The findings of Kern & Smith (2008) state that the increasing dominance of regime actors present in a transition could prevent the niche from fully opening up or could lead to a lack of control policies that are pressuring the regime actors. As this study shows an increasing role for market regime actors who are stepping into the MaaS niche, there is a serious risk that this could happen in the sustainable urban mobility transition as well.

Some argue that the interest of these regime-actors in MaaS show opportunities for a synergy with the niche instead of oppressing or resisting it (Hirschhorn et al., 2019). Although regime actors could indeed foster the transition, for example by implementing their own MaaS initiatives like River, discussing the role of the government stays very important to prevent a situation suggested by Kern & Smith (2008) in the future. Moreover, big tech companies stepping in and monopolies owned by the public transport sector could also backfire, resulting in only a minimum effect on improved traffic conditions, such as a safer environment or more efficient use of urban space (Curtis et al., 2019). Monopolies come with the risk of higher prices for transport, making mobility less accessible for specific groups in society. A monopolist in public transport also creates a risk of oversupply (Vladimir & van Reeve, 2010). Picturing the streets full of shared scooters or bikes, one can imagine this could lead to a disruption of public order. When looking at the role of big tech companies in MaaS, other complex challenges on for example safe data-management and cybersecurity are becoming relevant (Butler et al., 2019). Considering these challenges is crucial to guarantee a safe and accessible use of MaaS. The future role of the government in relation to incumbent market regime actors should therefore be monitored carefully. This raises ethical questions, that are important to discuss in the scientific debate on power in MaaS: what responsibility do we want the government to take after the pilots? What role and responsibility do we envision for big tech companies and initiatives like River in the future MaaS-ecosystem? To what extent do we allow those actors to provide a public service? And what kind of power dynamics do we want or not want in the future MaaS-ecosystem? The results of this study show that these are critical issues to discuss in order to better cope with unintended power effects in the future of MaaS.

### 6.4 The value of the POINT framework and the MaP

The case study conducted in this research offers an analysis of power in transitions. By using the POINT framework of Avelino (2017) to distinguish different power relations and power dynamics, and the MaP (Avelino & Wittmayer, 2016) to distinguish different actors types, the micro-politics of MaaS in the Netherlands could be described in detail.

The pilot programmes in Eindhoven and Amsterdam Zuid show a complex field of different actors switching between niche and regime level. Different types of power are exercised within and between the sectors of the MaP, but also on a more abstract level between the niche and regime. As soon as the pilots are put into practice, this powerplay between niche and regime becomes clear. Incumbent market actors are defending their own business case, and traditional regulatory frameworks by the government create a lock-in and make

further development of MaaS very challenging. It shows the reinforcing power by the market and state sector on regime level and confirms the argumentation of Avelino et al (2016, p. 564) that “regime capture is endemic, inevitable and something to confront rather than to combat or deny”. In the case study this ‘regime capture’ happens simultaneously with the implementation phase of MaaS and goes together with a shift from state actors being powerful, to market actors being powerful. It leads to more competition and pushes the dynamics of cooperation and synergy more to the back. Despite the reinforcing power of the regime, it can be said that the niche was quite successful in challenging the regime. The transformative power of the niche in the beginning led to incumbent market regime actors starting to develop MaaS initiatives on their own. Something similar was stated by Hirschhorn et al. (2019), who found that actors from – what they called the public transport regime – are operating in the MaaS niche directly.

Although the interviews clearly displayed a strong impact by the pandemic on the mobility regime and MaaS, both the POINT framework and the MaP-framework do not offer an explanation of how disruptive changes can influence niche-regime interaction or the way power is exercised between actors or sectors. As disruptive change plays a crucial role in the acceleration of a transition (Loorbach et al., 2017), looking at the impact of disruptive changes on transition politics, is an interesting suggestion for further research. Even more remarkable is that this study does not directly show an acceleration, but rather a delay of the transition. The pandemic delayed both pilots: it made experimenting impossible as no user-data was available, and limited the access to money for some transport operators active on niche level. This led to less innovative power for niche actors compared to market regime actors. No clear statements can be made about the impact of covid-19 on the powerplay of MaaS, but the findings of this thesis at least implicate that disruptive changes have an influence on it. Theoretical exploration on how the impact of disruptive changes can be included in the POINT framework is needed to study events like covid-19 in the future.

Based on all the above, it is concluded that, despite some theoretical limitations, this study has proven that the POINT framework is useful to analyse power relationships between stakeholders in the MaaS-ecosystem. It offers a helpful tool to understand transitions from a socio-political perspective by showing that power is not something static, but that transition elements like incumbent market regime actors, can alter power relationships and can create a shift in power dynamics between market, state and third sector actors. Moreover, by using three different types of power – innovative, transformative, and reinforcing – it became possible to see that actors are moving back and forth between niche and regime level (e.g. state actors, market actors) and that they exercise different types of power in different points in time. Both the POINT framework (Avelino, 2017) as well as the MaP (Avelino & Wittmayer, 2016) highlight the existence of power structures between individuals, groups, and niche and regime. This insight is extremely valuable for scientific literature on transition politics. The theories of Avelino (2017) and Avelino & Wittmayer (2016) are able to reflect the complex reality not as black and white, but as one big grey zone in which different power relations and power dynamics between and within sectors can alternate or can exist simultaneously.

## 6.5 The relevance of ‘transition as discourse’ for the POINT framework

This thesis did not only want to provide a practical understanding of the niche-regime interaction on sustainable urban mobility, but also wanted to explore the relevance of the POINT framework and ‘transition as discourse’. The sections above have discussed this relevance for each theory separately, but interesting is to look at what it means for studying transition politics if these theories are combined. When describing the POINT framework and the ‘transition as discourse’ framework in chapter 2, the suggestion of a potential link between these theories was made (see paragraph 2.4). It was expected that the technocratic transition frame would be used to mainly exercise reinforcing power, while the radical transition frame would be used to mainly exercise innovative or transformative power. The findings of this thesis do not confirm this expectation. In fact, they show the opposite: Although the MaaS-frame of the government reflected the technocratic transition frame most strongly, it was used to mainly exercise transformative power. Thanks to the theory of ‘transition as discourse’ it was possible to understand how the frame was used as a resource to exercise power. And thanks to the POINT framework it became possible to see the impact of this power exercise in practice, where it united actors in the MaaS niche and contributed to cooperation and synergy. Only by combining the ‘transition as discourse’ with the POINT framework, it became possible to uncover the transformative nature of

the MaaS-frame. 'Transition as discourse' contributed to a more detailed understanding of how transformative power can be applied, and proved therefore to be a valuable addition to a practical application of the typology of the POINT framework. However, this study does not provide a sufficient response to the suggestion made in the introductory chapter. Future research is necessary to explore if there is a relation between specific transition discourses and the exercise of innovative, reinforcing, or transformative power. This could provide valuable insights about whether these discourses are used to reshape or to reproduce regime structures, and thus, what their influence is on niche-regime interaction.

## 6.6 Limitations and further research

This research contributed to a deeper political understanding of sustainability transitions by analysing discursive frames and power relations in the Dutch MaaS case. By using the 'transition as discourse' theory, as well as the MaP and the POINT framework, valuable new insights about the micro politics in the MaaS-ecosystem were provided. However, it is important to note that there are limitations to this research that possibly have influenced the outcome. Based on these, suggestions for future research are formulated.

First of all, in applying the MaP this research decided to focus on market, state and third sector actors. It was assumed that these actor groups would have the most influence on shaping the pilot-programme, since they include the key players in the organisational process of the MaaS-pilots. Due to time limitations, interviewing all stakeholders was impossible and by focusing on the organisers, the most influential actors were included in the power analysis. Since MaaS-users did not actively participate in the organisation process, but were mainly (test)users of MaaS, it was decided to exclude the actor group 'community' from the analysis. This means the role of the community and their power relations with the other actor groups in the MaaS-ecosystem remains unknown. During the interviews, access to user-data was mentioned several times as crucial for the further development and success of MaaS. This implicates a very powerful role for the users, as they are an actor group providing a certain power resource to other niche actors. To investigate this hypothesis, further research about the communities' access to resources, responsibilities and interests in and around MaaS is needed. This will also contribute to a more complete overview of the micro-politics of MaaS and give a deeper insight in potential bottlenecks for implementation. Alonso-González et al. (2020) already determined some attitudes in this actor group that function as barriers for the adoption of MaaS, such as a car-ownership need. Exploring how these attitudes could be related to the users' power exercising could shine an interesting light on the MaaS politics.

Second, in this study the investigated powerplay specifically focussed on niche and regime level, since the research aim was to get a political understanding of the niche-regime interaction in the sustainable urban mobility transition. What remains therefore underexposed is the possible power relation between niche and landscape and regime and landscape. The POINT framework does offer theoretical insights about this interaction, which shows the strength of this framework in capturing a complete overview of power in transitions. Avelino (2017) distinguishes for example between dominant and counter macro-trends in the landscape, each exercising different kind of powers and thus effecting the regime differently (see figure 18). These theoretical insights could be very useful for follow-up research on this thesis. Some findings indeed implicate a power influence coming from landscape level. The focus on economic growth, that is present in the MaaS-frame and in both pilots, shows the influence of a capitalistic macro-trend. This same trend is reflected by the prediction of the future powerplay in the MaaS-ecosystem. The risk of the formation of MaaS-monopolies due to transformative and reinforcing power exercised by either big public transport organisations or big tech companies, reflects aspects of a capitalistic system. Another landscape influence indicated by the findings is Covid-19. The focus of this research was on studying the niche-regime level, and it made sense to therefore understand the pandemic as disruptive change impacting this level. It did not even consider the pandemic as possible landscape influence, as it was out of the scope of this research. However, Covid-19 was described by many interviewees as an external impact, lying outside their circle of influence. This indicates a power exercise coming from landscape level. Including the landscape level into the power-analysis could therefore not only uncover power dynamics that have been overlooked, such as the capitalistic macro-trend, but also shine a new light on the current power dynamics, for example when considering covid-19 as landscape element, instead of disruptive change. Future case studies that consider Avelino's insights on macro-trends

(Avelino, 2017) could thus contribute to a more complete understanding of power in the sustainable urban mobility transition.

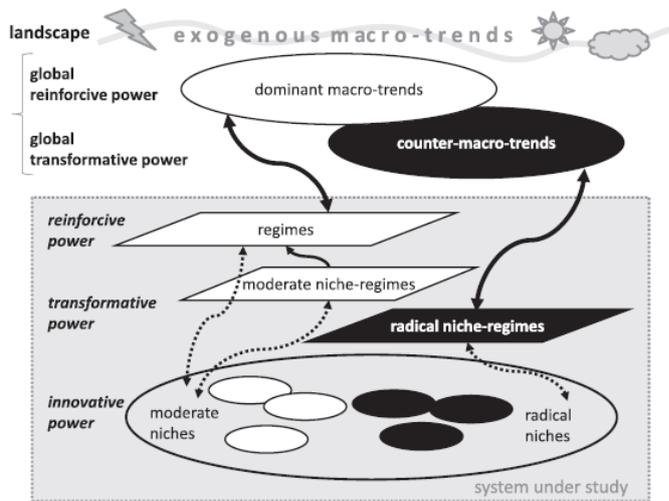


Figure 16: The complete Power in transition (POINT) framework, including landscape level (Avelino, 2017)

Third, although the choice for the Netherlands as a case study was made considerably, studies about MaaS politics in other countries are needed to search for trends in MaaS as part of the sustainable urban mobility transition. The Netherlands was chosen due to its experience with transition governance and the high acceptance of MaaS by policy-makers, which was helpful to collect a sufficient amount of high quality data. However, it must be said that the power dynamics and relationships determined in this study are based on the specific circumstances of Eindhoven and Amsterdam. The pilots contained unique conditions, such as ASML taking a leading pioneering role in the pilot of Eindhoven, and the design of the pilots according to the Rijnland model. Consequently, the powerplay described does not apply directly on other MaaS-ecosystems in other countries. Transitions in the Netherlands have been noted as particularly interesting by transition scientists due to their often innovative approach and their explicit application of transition governance (Kern & Smith, 2008; Bosman et al., 2014; Gooyert et al., 2016; Much, 2019). In countries where government interference on transition management is not normalised, it can be expected that market actors play a more powerful role from the beginning of the implementation of MaaS. This hypothesis is supported by findings from Hirschorn et al. (2019), who compared the Dutch MaaS scheme with MaaS schemes in Helsinki and the UK. In the UK, where transport actors rely more on market forces and less on state regulation, both state and market actors are using different approaches to shape the interaction between the MaaS niche and the public transport regime, compared to the Dutch case. Expanding research on transition politics to other countries which have a more privatised MaaS, is valuable to confirm this hypothesis or to see whether the findings about the shifting power dynamics present in the Dutch MaaS case are also applicable in other institutional contexts. This knowledge can be used to tailor transition governance to these specific institutional context. It can also help the governments of these countries to consider to interfere less or more in the mobility market, based on the power dynamics in their MaaS-ecosystem.

## 7. Conclusion

Transitions are inherently political as there are always different interests involved in decision-making processes. Studying transitions from a socio-political perspective is useful to understand how political processes contribute to, restrain or reshape processes of long-term change in society. This thesis has attempted to do so by focusing on the sustainable urban mobility transition in the Netherlands and taking the politics of Mobility-as-a-service (MaaS) as the main study object within this transition. Due to different traffic related challenges, cities are looking at ways to stimulate sustainable urban mobility, among them MaaS. MaaS is a user-centric approach on mobility that offers an all-inclusive mobility service provided via an app. With a MaaS-app a user can plan, book and pay his/her travel and use different kinds of transport modes, ideally based on his/her personal needs. A critical political understanding of the niche-regime interaction between MaaS and the mobility regime in the Netherlands was created by looking at the role of discursive frames and power. The following research question was defined:

*What is the role of power in shaping the relation between MaaS and the current mobility regime in the Netherlands?*

This research question has been analysed by conducting a qualitative analysis consisting of a document-analysis of governmental MaaS documents and doing semi-structured interviews with actors from the Dutch MaaS-ecosystem. These actors were involved in either the MaaS-pilot at the Amsterdam Zuidas or the MaaS-pilot in Eindhoven. Both pilots were focused on a broad application of MaaS in an urban area in the Netherlands and part of the national pilot-programme on MaaS, initiated by the Dutch ministry of Infrastructure and Water Management. The discursive framing of MaaS by the Dutch government was analysed first. By using the theory of 'transition as discourse' (Audet, 2016) it became possible to see how MaaS is positioned by the initiator of the pilot-programme and to notice the impact of this framing on the power relations in practice. The concluding remarks of this can be found in paragraph 7.1. Additionally, by looking at the power relations and dynamics during different phases of the pilots in Eindhoven and Amsterdam Zuid, a critical understanding could be developed about the micro-politics of MaaS. Paragraph 7.2 will present the concluding remarks of how power is exercised by the actors of the MaaS-ecosystem, according to the POINT framework (Avelino, 2017) and the MaP (Avelino & Wittmayer, 2016). Both frameworks proved to be very valuable to analyse the micro-politics of MaaS. Paragraph 7.1 and 7.2 work towards the overarching conclusion in paragraph 7.3. Finally, in paragraph 7.4, some recommendations for policy and transition governance are made.

### 7.1 The discursive framing of MaaS by the Dutch government

The discursive framing of MaaS by the Dutch government – called the Dutch MaaS approach – can only be understood from the notion that the government frames MaaS as crucial for the digital mobility transition, rather than the sustainable urban mobility transition. Digitalisation is seen as inextricably linked to new ways of (organising) mobility. Sustainability is assumed to be one of the outcomes of this digital mobility transition, but what this means in practice stays unmentioned.

The Dutch government applies their MaaS-frame by using three discursive statements that together create a coherent story of MaaS as an innovative and collaborative initiative. These discursive statements were found by a discursive analysis of twelve Dutch policy documents about MaaS and/or future mobility. The first discursive statement – MaaS is a win-win – includes the presentation of MaaS as an innovation that offers different opportunities: it is presented as a smart and sustainable solution for society, a governance instrument for the state, and a business case for the market sector. MaaS as a win-win is able to overcome the conflict between the acknowledged complexity of MaaS, and the collaboration that is seen as requirement for MaaS. The second discursive statement – MaaS is something that needs to be regulated – highlights the importance of the public interest that needs to be protected by the state. It functions as a solving statement for the conflict between collaboration and competition that are both seen as key for the success of MaaS. The last discursive statement – MaaS is something we can learn from – acknowledges the complexity and uncertainty that come with MaaS, but states that through learning processes this uncertainty and complexity can be managed.

Collaboration and innovation are key in all three discursive statements and can be summarised in what the government frames as working together, learning together, and sharing together. The three 'togethers' directly reflect the presence of collaboration. This collaboration is a requirement for creating the win-win of MaaS and for the public-private governance part of MaaS, coordinated by the government. The connection between collaboration and innovation is close and they are often overlapping. After all, collaboration is presented as one of the innovative aspects of MaaS; it is key to the whole process of MaaS, which is presented by the Dutch government as unique and innovative approach.

By framing the importance of a governed and regulated MaaS, which is comprised by the third discursive statement, the government legitimizes their steering role as economic enabler of MaaS and protector of public interest. The discursive analysis showed that by using the first discursive statement (MaaS is a win-win), together with the third discursive statement (MaaS as learning opportunity) the government shines a very optimistic light on the MaaS niche. Moreover, mentioning the importance of competition in the second discursive statement (a regulated MaaS) and the importance of a viable business case in the first discursive statement (MaaS is a win-win), helps the government shaping the MaaS niche into an economic space.

## 7.2 The power exercise in the MaaS-ecosystem

The MaaS-ecosystem is an arena of many different actors active on niche and regime level. By doing semi-structured interviews with actors from the state, market and third sector, it became clear that the powerplay is the result of a complex field of actors on both niche and regime level. These actors have access to different types of resources, resulting in different power relationships and power dynamics.

At the start of the MaaS-pilots, state actors exercise transformative power by putting the MaaS frame in the centre during the preparation process of MaaS. Moreover, due to their formal role as principal of the pilots, the government is able to shape the requirements for MaaS by which they decide over the inclusion and exclusion of the key players of the pilots. The strong presence of state actors in the beginning leads to mainly cooperative and synergetic power dynamics between market, state and third sector actors. There is a serious drive from all niche actors to make something out of the pilots, which is stimulated by the optimistic MaaS-frame of the government. Innovative power is exercised by the third sector actors and market actors. In the market sector, this results in synergetic consortia. Within these consortia it is the MaaS-provider that exercises transformative power, by developing and implementing a MaaS service that is challenging regime actors to act and think differently about mobility services. This transformative power can only be exercised due to the cooperation with the third sector and synergy with the other actors in the consortium. These actors are providing the right resources to the MaaS-provider to exercise this transformative power.

Although this collaborative powerplay continues during the implementation phase, competing power dynamics are becoming dominant, as incumbent market regime actors are stepping into the niche level. This process also shows that the mobility regime is exercising reinforcing power towards the niche. On regime level, the market and state disempower niche actors and limit further development of the pilots. Incumbent market actors apply reinforcing power to defend their strong market position. Incumbent state structures, like privacy regulations, prevent niche actors from really experimenting with MaaS. Moreover, state actors lack flexibility due to a lock-in in their own institutional regime. It leads to an antagonistic power dynamic between the relationship of the NS (the official Dutch train organisation) and the State and the relationship between the MaaS-provider and the state. The state's incumbent relationship with the NS is restricting the transformative power of the MaaS-provider, despite the state's empowerment of the MaaS-provider. During the implementation of MaaS, the MaaS-frame becomes less visible in the power exercise of all actors, which goes together with a declining state influence on niche level.

Despite the reinforcing power of the regime, it can be said that the niche was quite successful in challenging the regime. The transformative power of the niche in the beginning led to market regime actors starting to develop MaaS initiatives on their own. This has created a complex powerplay in which market regime actors on the one hand are showing reinforcing power, as they are defending their powerful market position. On the other hand, they are stepping into the niche by contributing with own MaaS initiatives, by which they are exercising innovative and transformative power. Powerful actors like the NS are able to develop MaaS

initiatives on their own by which they are exercising transformative power and are competing with the MaaS-providers. Less powerful transport operators are showing innovative power when stepping into the niche, resulting in a synergy between them and the MaaS-provider.

### 7.3 Two shifts shaping the niche-regime interaction

To conclude, power is extremely important for shaping the relation between MaaS and the current mobility regime in the Netherlands. Due to different accessibility levels to resources, different interests, and different roles and responsibilities, power relations result in different power dynamics that either empower or disempower actors. Two important shifts were identified, shaping the niche regime interaction: (1), a shift from mainly cooperation and synergy to competition; and (2), a shift from state actors as dominating actors to market actors as dominating actors in the MaaS-ecosystem. At the start of the pilots, the discursive framing of the government is very influential and shapes the MaaS niche as beneficial for society and market actors, while creating a key player role for the government themselves. The discursive framing of MaaS therefore functions as a resource for the Dutch government to exercise transformative power. The government is able to create a shared understanding of what is important in MaaS and why it should be successful among the niche actors. It shapes the niche as an economic space where there is plenty of room for collaboration. Cooperation and synergies are dominating power dynamics present among the niche actors. Because of these collaborations, the niche is able to exercise transformative power in the direction of the incumbent regime. Although this powerplay continues during the implementation phase of MaaS, a change in power dynamics is visible and different power dynamics are becoming dominant over time. Due to reinforcing power exercise by the regime and the consequences of the disruptive event of covid-19, the niche is disempowered, which offers market regime actors the possibility to step into the niche. It leads to a more blurred line between niche and regime. More competition between actors becomes visible and pushes cooperation and synergy to the back. The stepping in of market regime actors leads to a shift from a powerplay dominated by state actors to a powerplay dominated by market actors. This second shift goes together with less power for the state on niche level. Instead, the state is being locked in by their own reinforcing power on regime level. The powerful position of the government shaped the powerplay in a cooperative and synergetic way. This is now being overshadowed by the powerplay of competition in the implementation phase of MaaS, which disempowers the state as niche actor. The niche is now mainly shaped by the market actors.

It can be concluded that the two shifts both empower and disempower the niche. On the one hand it disempowers niche actors, since they have to compete with more (powerful) market actors developing their own MaaS-initiatives. On the other hand it empowers the niche as a whole, as these regime actors stepping into the niche-level will contribute to challenge the regime more and more in the future, which could foster the digital mobility transition as described by the government. It means that although reinforcing power exercised by the mobility regime is clearly present in the Dutch MaaS case and has limited the development of the MaaS niche, it is not necessarily restricting the transition to digital mobility as a whole.

### 7.4 Policy recommendations for the future of MaaS

The end of this thesis is near and there is much that can be said about the relevance of the findings for policy and transition management. To finish, the most crucial takeaways of this thesis for policy-makers are highlighted.

First, policy makers could use the findings of this research to become aware of the pitfalls of the MaaS-frame and use this to revise and improve it to prioritise sustainability. This research found that sustainability is not at the core of the frame and that the government is framing MaaS as part of a digital mobility transition, instead of a sustainable urban mobility transition. It also showed the impact of the frame on the powerplay of the MaaS-ecosystem, which proofed that discursive frames can be applied as power resource. In the context of an urgent need to act on climate change now (Shukla et al., 2022), the sustainable urban mobility transition is playing a crucial part in mitigating GHG emissions in cities (Torrise et al., 2020). It is in the public interest that the aspect of sustainability is taken seriously, and since the Dutch government is framing themselves as the protector of the public interest, they should realise that sustainability is part of this responsibility too. Politicians and policymakers should therefore be more critical at the role sustainability is currently playing in

the MaaS-frame. This starts with mapping how MaaS is currently connected to sustainability transitions, how this can be improved and how new linkages can be made in the near future. A next step could be to define explicitly what the sustainable outcomes of MaaS should be, considering these linkages.

Second, policy makers should invest in a better understanding of the impact of disruptive events and use this for writing transition policy. The future of the sustainable urban mobility transition, as well as the digital mobility transition defined by the government, is highly uncertain, due to the influence of Covid-19 and the planned hands-off approach of the Dutch government. The pandemic delayed the MaaS-pilots, had an impact on the accessibility to resources, and therefore influenced power relationships between actors. Deeper theoretical investigation of the POINT framework is necessary to fully understand how disruptive events like covid-19 influence power relations and dynamics. In this thesis it has been shown already that disruptive events have political implications and could possibly continue to impact power relations in the future. The pandemic will not be the last disruptive event influencing the sustainable urban mobility transition. Increasing fuel prices globally due to the current war between Russia and Ukraine, show that global events can directly impact the mobility sector on a daily basis (Kolaczowski, 2022). Furthermore, with mobility becoming more and more dependent on digital infrastructure, real opportunities for criminal cyberattacks are created. Those can not only affect the operationalisation of mobility services but also society as a whole (Argyropoulos et al., 2021). These examples could all possibly cause disruptive changes in the sustainable urban mobility sector. Policy-makers should therefore actively engage with transition science and use the findings of this research and future research to understand the impact of possible disruptive events in practice. An understanding will help to develop long-term policy that is able to consider events like covid-19 in the future, and to therefore manage transitions more effective.

Third, discussing the future role of the government in MaaS in an open environment with all actors of the MaaS-ecosystem is important to consider the different interests of those actors in transition governance. This thesis shows that when the pilot programme ends and the Dutch government puts their hands off the pilots, there is a possibility of incumbent market regime actors taking over the MaaS niche. A MaaS niche controlled by powerful big tech companies or the NS, both having enough transformative power to set up their own MaaS initiatives, could be the result. It could lead to monopolies, which puts the public interest and the level-playing field of MaaS at risk. This asks for an open discussion with market actors as well as the users of MaaS about the future role of the government. The ethical questions raised before about what role we envision for the state, big tech and the NS should therefore be expanded beyond the academic world to the policy sector.

Ultimately, power in the sustainable urban mobility transition is dynamic, rather than something static, and is influenced by many factors and on many stages during the transition process, which makes the transition unpredictable. Managing and controlling the sustainable urban mobility transition will thus, only be possible to a certain extent. However, it can be steered in a certain direction, which was among shown by the impact of the MaaS-frame on the powerplay of the MaaS-ecosystem. Assuming that sustainable outcomes will automatically result from the digital mobility transition, and that the market will be able to manage the transitions themselves, will not be enough to make MaaS the win-win solution that the government is hoping for. Certainly, it will not be enough to cope with the environmental challenges we are currently facing in the traffic sector. With the pilots ending by the end of 2022, there is limited time to define what role of the government will be after the pilots end. At the same time it also offers opportunities for state actors to define a new role for themselves as protectors for the public interest and ambassadors of sustainability. With this hopeful prospect, MaaS will not only make our travel more convenient, but also more responsible.

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# Annex 1: Interviewguide

The interviews were held in Dutch, since all the interviewees were Dutch and the pilots that were investigated took place in a Dutch working environment. Therefore, the interview guide has been composed in Dutch as well.

## [Opening of the interview]

Goedendag, leuk u te ontmoeten en wat ontzettend fijn dat u mee wilt werken aan mijn onderzoek.

## [smalltalk – jezelf voorstellen]

Mijn onderzoek focust zich op het politieke aspect van mobility as a service, dus hoe de verschillende stakeholders/belanghebbenden uit het MaaS speelveld zich tot elkaar verhouden, wie waarop invloed heeft, of dit probeert uit te oefenen. Ik ben nieuwsgierig naar in hoeverre dit speelveld van stakeholders achter MaaS de transitie naar duurzame mobiliteit in Nederland beïnvloedt.

De resultaten van dit interview zullen gebruikt worden als data voor mijn masterthesis. Ik ben u daarom zeer dankbaar voor uw tijd. Mede dankzij u kan ik straks afstuderen.

Ik zal tijdens het interview vragen stellen over de MaaS-pilot, ik ben specifiek geïnteresseerd in de relaties tussen de verschillende stakeholders die betrokken zijn bij de pilot, en niet zozeer in de uitkomsten van de pilot zelf. Er zijn geen goede of foute antwoorden, het interview zal ongeveer 45 minuten duren en zal worden opgenomen. U heeft het *inform consent* formulier al ondertekend, maar voordat ik op ‘recording’ klik wil ik nog een laatste maal checken of u hier ok mee bent.

Vraag	Doorvragen op (dikgedrukte vragen hebben prioriteit)...	Topic list
<p><b>In welk opzicht is MaaS vernieuwend ten opzichte van eerdere projecten in de mobiliteitssector?</b></p> <p><u>Informatie winnen over:</u> Hoe MaaS het regime uitdaagt, welke disruptive change het kan veroorzaken?</p>	<p><i>Waarom wordt dat juist als vernieuwend gezien?</i></p> <p><b>(Hoe) verandert het de samenleving?</b></p> <p><i>(Hoe) verandert het de manier van reizen?</i></p> <p><i>(Hoe) verandert het denken over reizen?</i></p> <p><i>(Hoe) past het binnen de transitie naar duurzame mobiliteit?</i></p> <p><i>Verandert het de verantwoordelijkheden van de vervoersaanbieders en/of overheid?</i></p>	<p><i>Nieuw reisgedrag</i></p> <p><i>Duurzamer</i></p> <p><i>Auto laten staan</i></p> <p><i>Gebruik van Data</i></p> <p><i>Nieuwe rollen(MaaS provider)</i></p> <p><i>Integraal reizen</i></p> <p><i>Reiziger centraal</i></p> <p><i>Rol overheid</i></p> <p><i>Multimodaal</i></p> <p><i>Gebruiksvriendelijker</i></p>
<p><b>Hoe beïnvloeden deze vernieuwende aspecten de organisatie en uitvoering van de pilots?</b></p> <p><u>Informatie winnen over:</u> Hoe zie je de niche-regime interactie terug in praktijk?</p> <p><b>Nieuwe structuren</b></p> <p>(10 min)</p>	<p><i>In hoeverre houden jullie je bezig met deze vernieuwende aspecten van MaaS?</i></p> <p><b>Hoe zijn jullie bezig met het toepassen van die vernieuwende aspecten?</b></p> <p><b>Hoe zie je deze vernieuwende aspecten terug in de praktijk?</b></p> <p><i>Wat zijn praktische werkzaamheden die jullie verrichten?/ Wat doen jullie?</i></p> <p><i>Is er een andere strategie aan verbonden?</i></p> <p><i>Verandert het de verantwoordelijkheden van de vervoersaanbieders en/of overheid?</i></p> <p><i>Krijgen jullie te maken met nieuwe organisaties? Nieuwe partijen?</i></p>	<p><i>Reiziger centraal</i></p> <p><i>Nieuwe strategieën</i></p> <p><i>Andere verantwoordelijkheden</i></p> <p><i>Nieuwe samenwerkingen</i></p> <p><i>Nieuwe wetten/ regels</i></p> <p><i>Nieuwe organisaties</i></p>

<p><b>Welke gezamenlijke belangen spelen een rol bij MaaS?</b></p> <p><u>Informatie winnen over:</u> Hoe belang bepaalt op welke manier een stakeholder betrokken wilt zijn en zijn relatie vormgeeft.</p> <p>Power relations – exercise power</p>	<p>Waarom vinden jullie dit zo belangrijk? Wat willen jullie er mee bereiken? Welke link is er tussen dit belang en duurzame mobiliteit? Economie? Duurzaamheid? Toekomstgerichtheid? <b>Wat verbindt jullie als stakeholders om allemaal aan deze pilot te werken?</b></p>	<p>Risico's Invloed op... Vertegenwoordigen van... Verbeteren van... Duurzame mobiliteit Service verbeteren Efficiënter reizen Toekomstgericht Economie</p>
<p><b>Welke uiteenlopende belangen ziet u tussen de betrokken partijen?</b></p> <p><u>Informatie winnen over:</u> Hoe belang bepaalt op welke manier een stakeholder betrokken wilt zijn en zijn relatie vormgeeft.</p> <p>Power relations – exercise power New structures or reproducing structures</p> <p>(25 min)</p>	<p><b>Hebben jullie ook een verschillend belang ten opzichte van anderen?</b> Waarom willen jullie betrokken zijn bij MaaS? Concurrentie positie? / Profileren? Hoe zijn jullie betrokken geraakt bij de pilot? In hoeverre is de organisatie van de pilot afhankelijk van wat er in de lokale politiek gebeurt/ van wat er in de landelijke politiek gebeurt?  <b>Welke rol speelt data hierbij? (Ook na de pilot?)</b></p>	<p>Risico's Invloed op... Vertegenwoordigen van... Verbeteren van...</p>
<p><b>Hoe zijn de verantwoordelijkheden en rollen verdeeld in de organisatie van de pilot?</b></p> <p><u>Informatie winnen over</u> Power relations – exercise power – resources New structures or reproducing structures</p> <p>(30 min)</p>	<p>Wie voert welke taken uit? Wie zitten er in de kerngroep/stuurgroep? <b>Wie financiert? Welke financiële stromen spelen een rol bij de pilot?</b> <b>Wie besluit? → In hoeverre zijn jullie Afhankelijk van de besluiten door het Ministerie/de Gemeente</b> Wie adviseert? Wie voert uit? Wie faciliteert? Wat is de rol van het ministerie van I&amp;W? Wie heeft het gewenste netwerk? Wat is jullie rol en verantwoordelijkheid? <b>Wie heeft de meeste expertise op het gebied van MaaS? En hoe beïnvloedt dit de pilot?</b></p>	<p>Verantwoordelijkheden Taken Geld/ financiering Communicatie Netwerken Faciliteren Bemiddelen Adviseren Onderzoek doen Uitvoeren</p>
<p><b>Kunt u de relaties tussen de verschillende stakeholders eens beschrijven?</b></p> <p><u>Informatie winnen over:</u> Power relations – resources Verwijs terug naar belangen vraag en verantwoordelijkheden vraag! (40 min)</p>	<p>Wie oefenen invloed uit naast elkaar? Wie werken elkaar tegen? Wie werken met elkaar samen? <b>Wie zijn er afhankelijk van elkaar?/ Wie hebben elkaar nodig?</b> <b>Wie versterken elkaar?</b> Wie concurreren met elkaar? <b>Kunt u uw relatie met .... wat verder toelichten?</b></p> <ul style="list-style-type: none"> <li>- De OV partijen!!</li> <li>- De MaaS aanbieder</li> <li>- De gemeente</li> </ul>	<p>Wie invloed op wie Samenwerken Tegenwerken Versterken Afhankelijkheid Concurreren</p>

	<ul style="list-style-type: none"> <li>- <b>Tussen de vervoersaanbieders?</b></li> <li>- <b>Brainport Eindhoven</b></li> </ul>	
<p><b>(Wanneer) hebben jullie je als ..... ooit ondersteund gevoeld (empowered) binnen het proces van de pilot?</b></p> <p><u>Informatie winnen over: empowerment – power relations</u></p>	<p><i>Door wie/wat?</i></p> <p><i>Waarom?</i></p> <p><i>Door een andere partij?</i></p> <p><i>Door een bepaalde organisatie structuur?</i></p> <p><i>Door bureaucratie?</i></p>	<i>Empowerment</i>
<p><b>(Wanneer) hebben jullie je als .... ooit weerstand ervaren of je gelimiteerd gevoeld (disempowered) binnen het proces van de pilot?</b></p> <p><u>Informatie winnen over: disempowerment – power relations</u></p> <p>(45 min)</p>	<p><i>Door wie/wat?</i></p> <p><i>Waarom?</i></p> <p><i>Door een andere partij?</i></p> <p><i>Door een bepaalde organisatie structuur?</i></p> <p><i>Door bureaucratie?</i></p> <p><b>Hebben jullie als AMAZE/Gemeente ooit weerstand ervaren vanuit andere partijen binnen de pilot?</b></p>	<i>Disempowerment</i>
<p><b>Vanuit uw ervaring met de pilot, welke uitdagingen ziet u dan bij de ontwikkeling van MaaS in onze huidige maatschappij?</b></p> <p><u>Informatie winnen over: Hoe zie je de niche-regime interactie terug in praktijk en waar werkt het regime de niche tegen. Waar worden bepaalde regime structuren gereproduceerd?</u></p> <p>(15 min)</p>	<p><i>Waar de wil om te veranderen ontbreekt?</i></p> <p><i>Waar het denken over mobiliteit nog niet zo ver is?</i></p> <p><i>Welke structuren vastgeroest zijn en moeilijk te veranderen?</i></p> <p><i>Welke organisaties vastgeroest zijn en moeilijk te veranderen?</i></p>	<p><i>Weerstand</i></p> <p><i>Gedragsverandering</i></p> <p><i>Veel partijen</i></p> <p><i>Bureaucratie</i></p> <p><i>Vastgeroest denken</i></p> <p><i>Prioriteit bij infra</i></p> <p><i>Andere prioriteiten</i></p> <p><i>Politiek en beleid</i></p>
<p><b>Wat is er hetzelfde gebleven in de mobiliteitssector/ons reisgedrag ondanks de pilots?</b></p> <p><u>Reflectievraag om te eindigen, alleen als er tijd is.</u></p>	<p><i>Welke organisaties zijn er nog steeds?</i></p> <p><i>Welke instituties zijn er nog steeds?</i></p> <p><i>Welke regels, wetten en beleidsstukken zijn er nog steeds?</i></p> <p><i>Welke mentaliteit is er nog steeds?</i></p> <p><i>Welk gedrag is onveranderd?</i></p> <p><i>Welke prioriteiten zijn onveranderd?</i></p>	

Dit was de laatste vraag van het interview. Zou u nog iets willen toevoegen waarvan u denkt dat het handig of belangrijk kan zijn voor mijn onderzoek?

Ik ga de opname uitwerken, deze ga ik volledig uitschrijven, waarna ik bruikbare data heb voor mijn onderzoek. De opname wordt opgeslagen op de onedrive van mijn universiteitsaccount en zal na de afronding van mijn thesis worden verwijderd. De uitgeschreven interviewdata worden bewaard zoals aangegeven in het *inform consent* formulier dat u heeft getekend. Ik zal nooit direct uw naam en functie noemen in mijn onderzoeksrapport. Bent u het er mee eens dat ik naar u verwijs als een ‘participant werkzaam bij.....’

Kent u nog mensen die wellicht ook geïnteresseerd zijn om een interview te geven? Dit hoeven niet per se mensen van uw organisatie te zijn, maar kunnen ook mensen zijn van een andere organisaties met wie u samenwerkt of hebt gewerkt voor de pilot.

Ik zou u nogmaals hartelijk willen danken voor uw tijd. Uw bijdrage is van grote waarde voor mijn onderzoek en dus ook voor mijn afstuderen. Ik vond het een genoegen met u in gesprek te zijn gegaan en hoop dat u ook een positieve ervaring heeft.

Mocht u later nog willen reageren dan kan dat altijd, u heeft mij mailadres. Fijne dag!

## Annex 2: List of interviews

Interview number	Sector from MaP	Pilot	Organisation	Date
Interview 1	Third sector	Amsterdam	ORAM	31-01-2022
Interview 2	Market sector	Amsterdam	Amaze	03-02-2022
Interview 3	Third sector	Amsterdam	Transport region Amsterdam (in Dutch: Vervoerregio Amsterdam, (VRA))	04-02-2022
Interview 4	Third sector	Eindhoven	ASML	07-02-2022
Interview 5	Third sector	Eindhoven	Brainport Development	09-02-2022
Interview 6	Market sector	Amsterdam	Arcadis	11-02-2022
Interview 7	State sector	Amsterdam	Municipality of Amsterdam	25-02-2022
Interview 8	State sector	Eindhoven	Province of North-Brabant	28-02-2022
Interview 9	State sector	Amsterdam	Municipality of Amsterdam	02-03-2022
Interview 10	State sector	Eindhoven	Municipality of Eindhoven	09-03-2022
Interview 11	Market sector	Amsterdam & Eindhoven	Transdev	14-03-2022
Interview 12	Market sector	Eindhoven	Turnn	15-03-2022

## Annex 3: Final code-book discursive analysis

\*code = Code is was not in provisional code-book and is added during open-coding

Different colors show different code groups

Code	Code description
*ACTORROLES	Role of actor, describes tasks, responsibilities and activities of actor involved in the MaaS-pilot.
*ACTORROLES: role of region	comments about the role of the local and/or regional level for the implementation of MaaS, can also be about the interaction between national and regional level. Describes tasks, responsibilities and activities of the region.
*ACTORROLES: role_business	Describes tasks, responsibilities and activities of business. Business can involve transport operators, consultancy companies, and every other organisation that strives to make interest, excluded are public transport organisations.
*ACTORROLES: role_government	Comments about the role of the government in the process of MaaS. Describes tasks, responsibilities and activities of the government.
*ACTORROLES: role_publictransport	Describes tasks, responsibilities and activities of public transport organisations. Also includes comments about the position of the public transport organisations in relation with other actors.
*ACTORROLES: role_users	Comments about the role of the (future) users of MaaS-apps, also include comments about potential users, so people that take part in traffic, but do not use MaaS yet (and maybe never will).
COMPLEX	All comments about why MaaS is complex to implement, coordinate, monitor or to make a success.
COMPLEX: organisation	Complexity because it requires organisational solutions or it is related to organisational problems: comments related to bureaucracy, tinkering, protocols, rules. Include comments about actors when it is about the amount of actors involved.  <i>merged with code COMPLEX: political --&gt; Complexity because it is related to political challenges: overcoming powerplays, and a lot of different interests to take into account, coming to an agreement. Include comments about actors when it is mentioned that they have different interests.</i>
COMPLEX: technical	Complexity because it requires technical solutions or it is related to technical problems that need to be solved.
*DES_CHAR	Descriptive characteristics about MaaS, has to be about: what is MaaS, how does it work, and how to define it?
*DES_CHAR: Business_case	When MaaS is described as a business case or something that can turn into a business case.
*DES_CHAR: Des_integraal	A property of MaaS, MaaS described as something that includes more than one travel related functionality: so planning, booking, travelling, paying and declaring your travel.
*DES_CHAR: Des_multimodaal	A property of MaaS, MaaS described as something that includes more than one transport mode: e.g. public transport, shared mobility, car, bike, taxi, walking.
*DES_CHAR: Des_reiziger centraal	A property of MaaS, MaaS described as putting the wishes of the user of mobility in the center, and/or is able to adapt to the wishes to the user.
*DES_CHAR: flexibiliteit	A property of MaaS, MaaS described as flexible, MaaS being demand-steering.
*DES_CHAR: Gebruiksgemak	A property of MaaS, MaaS described as user-friendly, easy to use, or that it makes travelling in general user-friendly.
*DES_CHAR: innovative	MaaS described as innovative or smart solution
DRIVER	The key players that are described as the drivers for the transition towards Sustainable urban mobility
DRIVER: business	Established companies and corporates in the mobility sector described as important players in the sustainable urban mobility transition. As someone having influence on decision-making and/or access to resources
(DRIVER: civil society)	citizens, the users of MaaS, social movements described as important players in the sustainable urban mobility transition. As someone having influence on decision-making and/or access to resources.
(DRIVER: science)	Scientists and scientific institutions described as important players in the sustainable urban mobility transition. As someone having influence on decision-making by advising decision-makers with scientific knowledge
(DRIVER: start-ups)	start-ups and innovations by entrepreneurs described as important players in the sustainable urban mobility transition. As someone having influence on decision-making and/or access to resources.
DRIVER: state	The state, being described as important player in the sustainable urban mobility transition. As someone having influence on decision-making and/or access to resources.

*DRIVER: systeemproblemen	Problems in the current mobility system described as important reason for sustainable urban mobility transition, and/or the decision to start with MaaS. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS	The expectations about (the) MaaS (pilot), can be negative and positive. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS: future scenario	Expectation about how MaaS can impact future society. Also includes comments about the growth potential of MaaS for the (near) future. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS: Insecurities	Expectations related to uncertainties. The insecurities of MaaS are mentioned, this can be about impacts, outcomes and scenario's that are not known. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS: needs	Expectation about what will be needed to implement (the) MaaS (pilot) successfully in the (near) future, also include: requirements set by a certain actor for making MaaS happening. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS: solution	MaaS is expected to be a solution for a certain problem. This code includes these problem descriptions, as well as explanations about how MaaS is expected to be the solution. <sup>[P1]</sup> <sub>[SEP]</sub>
*EXPECTATIONS: win-win	MaaS is being described as a solution for many problems or challenge at the same time. It is mentioned as the key to success, as a win-win for more actors at the same time, or as extremely advantageous for society.
GOAL	The reason(s) why MaaS has been started in the Netherlands <sup>[P1]</sup> <sub>[SEP]</sub>
GOAL: social-wellbeing	The reason why MaaS exists is because it contributes to the social well-being of the country, e.g. it is good for an inclusive, equal, healthy, accessible city. Not include when a comment is about economic welfare or sustainability (when it is mentioned as carbon neutral or part of climate policy) only
GOAL: smart & sustainable	The reason why MaaS exists is because it contributes to a more sustainable city or state of the country, in terms of ecological sustainability, which means when it is mentioned as carbon neutral, lowering emissions, or can be related to green energy or climate policy  <i>Merged with code GOAL: Smart --&gt; Creating a system that is smart is mentioned as a goal on itself, rather than something part of the process.</i>
GOAL: economic growth	The reason why MaaS exists is because it is good for the economic welfare of the country <sup>[P1]</sup> <sub>[SEP]</sub>
*GOAL: policy	When MaaS is mentioned as a mean to reach other policy targets, that are going beyond the mobility sector and the targets of MaaS as independent project. Also include comments about policy optimisation and MaaS as a steering mechanism.
GOV	Governance, the way MaaS is being steered by different actors. <sup>[P1]</sup> <sub>[SEP]</sub>
(GOV: bottom-up)	MaaS is being steered by social actors, such as social movements, citizens, frontrunners, as a bottom-up process
*GOV: public-private	MaaS is steered by multiple governing bodies from both the state and market sector, that are interacting to make and enforce rules within a specific policy arena or location
GOV: top-down	MaaS is being steered by top-down processes, by the state actors <sup>[P1]</sup> <sub>[SEP]</sub>
*PROCESS_CHAR	Descriptive characteristics about the process behind MaaS
*PROCESS_CHAR: Collaboration	A property of the process behind MaaS, where collaboration between different stakeholders is mentioned as part of the process to make MaaS happen.
*PROCESS_CHAR: competition	A property of the process behind MaaS, where competition between different stakeholders is mentioned as part of the process to make MaaS happen.
*PROCESS_CHAR: learning_trajectory	A property of the process behind MaaS, where learning about the impact and organisation of MaaS is mentioned as part of the process to make MaaS happen. MaaS is described as something we can learn from, to improve future mobility. The process is described as a place where it is allowed to make mistakes, to revise, to redesign, and where not everything is clear yet.
*PROCESS_CHAR: Monitoring	A property of the process behind MaaS, where monitoring the impact, outcome, and organisation of MaaS is mentioned as part of the process to make MaaS happen. Monitoring is being stressed as important for the process or mentioned as part of the process. Monitoring is about continuity of measuring the impacts and quality of MaaS, with or without the help of data from the pilots.
*PROCESS_CHAR: Positive_process	When the process about the organisation and implementation is described as going well, and successful.
*PROCESS_CHAR: role_data	Comments about the role of data for the functionalities in MaaS, also include comments about the functionality of data for improving MaaS, in implementing MaaS.
*PROCESS_CHAR: transparency	A property of the process behind MaaS. Where transparency is being stressed as important for the process. Transparency is about openness of data, sharing data, and easy access to information by all different parties in the MaaS-ecosystem
(RADICAL)	Comments on MaaS from a bottom-up process, focussing on empowerment and inclusion of small business and citizens in decision-making or policy-making around MaaS
RESOURCES	All comments about resources that might be needed in the transition towards sustainable urban mobility or to implement MaaS

RESOURCES: empowerment of people	Having the resources or ability to mobilise people and give small organisations a platform to get involved in MaaS
RESOURCES: finance	The resource of having the money needed to invest or to finance (parts) of the process and implementation of MaaS. Also include when it is about having access to money or to make money available for others
RESOURCES: frame	The resource of using strategic communication and presentation of MaaS by highlighting certain aspects of it, to convince others about the usefulness or non-usefulness of MaaS
RESOURCES: information	The resource of having access to data about users of MaaS, needed to monitor and implement MaaS. Also include when the comment is only about access to data, but not about the right to use this data or to study it.
RESOURCES: knowledge	The resource of having the right knowledge needed for implementation of MaaS
RESOURCES: network	The resource of having the right connections, network and social capital
TECHNOCRATIC	Comments on MaaS from a the top-down perspective, focussing on protocols and rules and decision-making by the state, or by big corporates that work together with the state
TRANSITION	the process of change from one system state to another via a period of nonlinear disruptive change. Changes should be described as something that will change the way we live, and comes with major challenges for society
TRANSITION: digital	the process of change from one a system state not dependent on data to a system state functioning data driven, via a period of nonlinear disruptive change. Changes should be described as something that will change the way we think about information or the way we use and gather information, and comes with major challenges for society
TRANSITION: mobility	the process of change from one mobility system to a mobility system that thinks from the perspective of the traveler, is focussed on travel behaviour instead of infrastructure, and more on the service than the modalities, via a period of nonlinear disruptive change. Changes should be described as something that will change the way we travel, and comes with major challenges for society
TRANSITION: sustainability	the process of change from one system state to a more ecological sustainable state with less emissions, and or climate adaptive measures, via a period of nonlinear disruptive change. Changes should be described as something that will change the way we live, and comes with major challenges for society
TRANSITION: urban	the process of change from one system state to another, via a period of nonlinear disruptive change. Changes should be described as something that will change the way we live in cities, and comes with major challenges for society

# Annex 4: Final code-book empirical analysis interview data

\*code = Code is was not in provisional code-book and is added during open-coding

Different colors show different code groups

Code	Description of code	Also in code group
AINTEREST	Interest of actor, describes the interest, the stake, the reason why an actor is involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	
AINTEREST: Business general	Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot <i>Split from code AINTEREST: market --&gt; Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot</i>	
*AINTEREST: collective	Describes the collective interest, the collective stake, the collective reason why 2 or more actor groups are involved in the MaaS-pilot.	
AINTEREST: community	Describes the interest, the stake, the reason why a community actor is involved in the MaaS-pilot	COMMUNITY
AINTEREST: MaaS provider	Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot <i>Split from code AINTEREST: market --&gt; Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot</i>	MARKET
AINTEREST: mobility provider	Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot <i>Split from code AINTEREST: market --&gt; Describes the interest, the stake, the reason why a market actor is involved in the MaaS-pilot</i>	MARKET
AINTEREST: state	Describes the interest, the stake, the reason why a state actor is involved in the MaaS-pilot	STATE
AINTEREST: third sector	Describes the interest, the stake, the reason why a third sector actor is involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	THIRD SECTOR
AROLE	Role of actor, describes tasks, responsibilities and activities of actor involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	
AROLE: community	Describes tasks, responsibilities and activities of community actor involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	COMMUNITY
AROLE: market	Describes tasks, responsibilities and activities of market actor involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	MARKET
AROLE: state	Describes tasks, responsibilities and activities of state actor involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	STATE
AROLE: third_sector	Describes tasks, responsibilities and activities of third sector actor involved in the MaaS-pilot <sup>(P)</sup> <sub>(SEP)</sub>	THIRD SECTOR
COMMUNITY: community	Informal, private, non-profit actors <sup>(P)</sup> <sub>(SEP)</sub>	
MARKET: market	Formal, private actors focussed on making profit <sup>(P)</sup> <sub>(SEP)</sub>	
STATE: state	Formal, public and non-profit actors <sup>(P)</sup> <sub>(SEP)</sub>	
THIRD_SECTOR: third sector	Facilitating and supporting actors of MaaS that are formalised and are intermediary between state, market and/or community actors.	
*COLLABORATIVE	Reasons mentioned why collaboration is important. With collaboration it is meant: the collaboration in the process of MaaS or reasons why actors should collaborate in the implementation of MaaS	
*COLLABORATIVE: because of collective goals	Collaboration is important because it helps to strive for/ achieve goals that are shared among two actors or more.	
*COLLABORATIVE: because of dependencies	Collaboration is necessary because actors are dependent on each other and thus need each other to	
*COLLABORATIVE: because of legal and jurisdictional reasons	Collaboration is necessary because legal rules prescribe it for the process of MaaS.	

*COLLABORATIVE: it is the trend	Collaboration between many actors is mentioned as a societal trend for big public-private projects like MaaS	
*COLLABORATIVE: to strengthen each other	Collaboration is important because it empowers actors, and collaboration can lead to a better result than no collaboration	
*Amsterdam Pilot	Describes specific conditions, circumstances or context of the MaaS-pilot in Amsterdam	no codegroup
*Eindhoven pilot	Describes specific conditions, circumstances or context of the MaaS-pilot in Amsterdam	no codegroup
*disempowerment	Describes the process through which an actor gains the incapacity, or to loses the capacity, to mobilize resources and institutions to achieve a goal	no codegroup
*empowerment	Describes the process through which an actor gains the capacity to mobilize resources and institutions to achieve a goal	no codegroup
*opinion	The interviewees' personal opinion of MaaS	no codegroup
PEVALUATION	Evaluation of power situation, the way a relationship between two or more actors is experienced (can be by both by one of the involved actors or another actor not part of this relationship, but part of the MaaS-ecosystem)	
PEVALUATION: negative	The relationship is described as bad, wrong, or as something that limits the process or requires improvement	
PEVALUATION: neutral	The relationship is described without a positive or a negative value, just a description of the relationship. Include also comments when a relationship is described as necessary for the process, but no positive or negative value is attached to the description. <sup>[P]<sub>SEP</sub></sup>	
PEVALUATION: positive	The relationship is described as good, beneficial, or as something that contributes to the process	
PRELATION	Power relation, the way two or more actors are related to each other by powerstructures	
PRELATION: different	Two or more actors are related because both exercise power in the same context, but they use different types of power	
PRELATION: moreless	Two or more actors are related because one actor has more or less of the same power than another actor in the same context. <sup>[P]<sub>SEP</sub></sup>	
PRELATION: over	Two or more actors are related because one actor has power over the other actor	
PTYPE	The qualitative type of power according to the POINT framework. <sup>[P]<sub>SEP</sub></sup>	
PTYPE: innovative	The capacity of actors to create new resources, new resources can be setting up networks, generating new types of data (information), getting new access to money (e.g. a different fund), mobilize minority groups that otherwise would not be heard, new communication strategies of presenting (aspects of) MaaS	
PTYPE: reinforce	the capacity of actors to reinforce and reproduce existing structures and institutions. Structures can be about partnerships or the way processes or organisations are organised	
PTYPE: transformative	The capacity of actors to develop new structures and institutions. Structures can be about partnerships or the way processes or organisations are organised	
RESOURCES	All comments about resources that might be needed in the transition towards SUM or to implement MaaS	
RESOURCES: empowerment of people	Having the resources or ability to mobilise people and give small organisations a platform to get involved in MaaS. <sup>[P]<sub>SEP</sub></sup>	
RESOURCES: finance	The resource of having the money needed to invest or to finance (parts) of the process and implementation of MaaS. Also include when it is about having access to money or to make money available for others	
RESOURCES: frame	The resource of using strategic communication and presentation of MaaS by highlighting certain aspects of it, to convince others about the usefulness or non-usefulness of MaaS	
RESOURCES: information	The resource of having access to data about users of MaaS, needed to monitor and implement MaaS. Also include when the access is there, but the right to use or study the data not. <sup>[P]<sub>SEP</sub></sup>	
RESOURCES: knowledge	The resource of having the right knowledge needed for implementation of MaaS	
RESOURCES: network	The resource of having the right connections, network and social capital	
*RESOURCES: users	The resource of having access to the (potential) users transport: which means being able to mobilize users to make use of a certain transport mode or MaaS of MaaS	
TRANSITION	the process of change from one system state to another via a period of nonlinear disruptive change. Changes should be described as something that will change the way we live, and comes with major challenges for society	

TRANSITION: landscape	deep structural trends and the wider external factors in society, these can be economic, cultural, sociological. Established norms, rules, habits about society in general, not specifically about the mobility sector	
TRANSITION: niche	spaces where radical innovations occur and are being developed. Include all comments about new techniques, new ways of thinking, new behaviour, new organisations.	
*TRANSITION: niche-regime interaction	Describes situations where MaaS is trying to challenge the incumbent actors or structures in society, or when these actors or structures help to foster or put barriers for MaaS. Also includes comments about how the society or actors from society respond on (the idea behind) MaaS or descriptions about whether society has/ has not been adapted to MaaS.	
TRANSITION: regime	The existing stable and accepted situation in society in which development is happening, with established organisations, rules, protocols, norms and values. Comments about disruptive change are not included here, but under code 'niche'	