Co-financing Public Transport

A study into the financial contribution of housing to public transport investments through private-public partnerships in inner-city redeveloped areas in the Netherlands.



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Colophon Document

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Preface

In front of you lies the thesis "Co-financing Public Transport - A study into the financial contribution of housing to public transport investments". By finishing this thesis I conclude my master at Radboud University. The process from the beginning to the final product has been an instructive period. With the emergence of COVID-19, I had to make other choices concerning the research method, but in the end, I still managed to obtain the intended data and results.

I am very grateful for the support I received by many people during this research. However, there are a few people I want to mention specifically. First of all, I would like to thank my supervisor, Frits Verhees. He was always quickly available when something needed to be discussed. The last semester he guided me and provided detailed feedback during the process. In addition, I would like to thank all the respondents for taking the time and effort to participate in this research. Finally, I want to thank my friends and family and in particular my girlfriend that supported me during this process.

Menno van Dinther, Nijmegen, August, 2020

Summary

Transport, as a form of mobility, is fundamental to the economy and society. However, the way people go from A to B has to be more sustainable in the future. At the same time, there is still an urbanisation trend, which increases the housing demand in cities. These two developments lead to a need to combine existing building, infrastructure and mobility with the growth of citizens in a sustainable way. To achieve these goals, there are high financial costs involved.

The aim of this study is to find insight into how housing can contribute to financing public transport in inner-city areas in the Netherlands. For this purpose, the following research question has been formulated: To what extent can housing finance public transport investments in inner-city redeveloped areas through public-private partnerships in the Netherlands?

Before the data collection, a literature research on relevant theories is conducted. After that, the theoretical framework was drawn up. In order to answer the research question, this study is methodologically supported by desk-research and in-depth interviews. There is chosen for a comparative case study, where in the first instance, each case is examined separately. The cases that have been studied are located in the Dutch cities: The Hague, Amsterdam and Utrecht. The three cases are all adjacent to a metropolitan area, with an open attitude for new financing alternatives and with a focus on public transportation.

The results that came forward out of the collected data showed that inner-city redevelopment is an integral task. Besides public transport, there is real estate, ecology and quality of the living environment that has to be taken into account. Developers are willing to contribute to the total package of development ambitions, including public transport. However, the developers have to create a balanced businesscase to continue building. At the moment, there is many research conducted on potential instruments that can be applied to financially contribute to public transport in an alternative way. Implementation of these financial instruments often requires a form of partnership between different stakeholders or a change in legislation.

Based on the results could be stated that it is challenging to constitute a partnership for public transport, but there are possibilities for PPP in light forms in the Netherlands. These PPPs makes public and private stakeholders jointly responsible for the development of the central structure and public space, in which the developers manage their own plots. At the moment, there is a growing understanding among the involved stakeholders to jointly search for a solution to finance public transport, because it can create a win-win situation for both public and private actors. This is where the joint financing of public transport has great potential.

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1. Introduction

1.1 Problem statement

A modern-day city is part of a complex system that is characterised by a large number of inhabitants, different modes of transport and a large number of businesses and institutions (Neirotti et al., 2014). The increase of population in urban areas in the Netherlands leads to several problems in the cities. An increase of congestion, pollution and social inequality for example (Neirotti et al., 2014; Albino et al., 2015). Urban planners face the task to solve these issues. Although, the fact that the Netherlands has been successful in urban planning compared to some other countries, it is still encountering problems against the sustainable development such as urban sprawl, urban decline and increasing share of private car trips (Alpkokin et al., 2004).

Urban problems are not new, for centuries there are issues related to the planning of places. Urban planning originated from the 16th century in the Netherlands and was used to reclaim large areas of land and keep the country safe and dry (Van der Cammen, 2012). Almost every square meter of the Netherlands is planned. Due to the long experience, the Dutch planners made an international name. In the 20th century, the Dutch planning system was one of the most advantageous of the world (Van der Cammen, 2012).

Despite their reputation, the Netherlands faced some urban problems after WOII to reconstruct the damaged areas. During the second half of the 20th century, multiple national policy documents on spatial planning were formed. The Fourth National Policy document (VINEX), was the first policy to include mobility-related measures on a national scale. Financial support was granted for both housing and mobility, but collaboration among the municipalities in a city region was a necessary condition (Van der Cammen, 2012). The neighbourhoods that were designed according to the VINEX policy contains multiple flaws. This VINEX policy aims to improve mobility. However, the VINEX locations scored badly on proximity, accessibility of public transport and mixing functions (Hilbers et al., 1999).

Transit-oriented development strategies (TODS), a concept that arose at the beginning of the 21st century, to tackle the issues regarding the combination of mobility and housing. TOD aims for transit and land use integration by focusing on city development around stations. This planning strategy intends to combine existed and future planning, to support transit use (Curtis et al., 2016). TODS try to counteract urban sprawl and car-dependence while promoting economic development (Madanipour, 2001).

An example of transit-oriented development can be found in Hong Kong. Where the company facilitating the metro network has developed a self-sufficient TOD strategy called Rail plus

Property. (Cervero & Murakami, 2009). The company does not receive subsidies to build the railway infrastructure from the government. Instead of money, they receive land grants around the stations that give the monopoly right to develop the area. If the infrastructure is built the same piece of land is worth more because a place near the station that is good accessible is in demand by many people in a big city as Hong Kong. Due to the increased value, they can sell the pieces of land at a high profit. As a result, it easily covers the cost of infrastructure investments (Cervero & Murakami, 2009).

Rail plus Property cannot be applied everywhere. The government has to provide much space to private developers. The urban planning system and possibilities in the Netherlands are different than in Hong Kong. In Hong Kong, they use uncultivated space, while the Dutch plan on using space that is already built. The space in the Netherlands is scarce, the director of the Association of Dutch Project Development Company (NEPROM) stated that the urbanisation continues and 700.000 houses have to be built in the next ten years. Half of the new houses are planned in inner-city areas (Fokkema, 2017). Due to the increasing housing demand, there is a need to combine existing building, infrastructure and mobility with the growth of citizens in a sustainable way (Fokkema, 2017). This will be a major challenge.

Public transport could be the solution to this challenge. This form of mobility is focused on transporting a large number of people at the same time in an environment-friendly way (PBL, 2016). In the Netherlands, public transport is already an important mode of transport for millions of people every day. Twenty-five billion kilometres were travelled in the year 2017 (Ministry of Infrastructure and Water Management, 2019). However, the percentage of total mobility in the Netherlands through public transportation is only 10%. In the vision document of public transport is pointed out that the Dutch government aims to relieve pressure on city centres, by using a range of alternative transport modes to free up space for urban housing development (Ministry of Infrastructure and Water Management, 2019).

Public transport investments vary in size and costs, this depends on the pursued goals of the investments. For example, in the Netherlands, there are different target areas (Ministry of Infrastructure and Water Management, 2019). At first, the national network, at which the focus is on the connection between cities. Second, the international network, which aims to connect economic core regions in adjacent countries. Thereafter, public transport investments in the metropolitan areas, where the focus is on the efficient and intelligent use of the limited amount of space in cities. At last, investments in regional public transport, where the goal is to make the facilities and activities accessible for everyone (Ministry of Infrastructure and Water Management, 2019).

In a more practical way, to achieve the goals, there have to be investments in multiple modes of public transport. This means investments in long-range modes as train transportation on the national and international track. Besides, in dense city areas, the accessibility will benefit most through developments on a smaller scale, for example metro, busses or light rail connections. Light rail is an upcoming concept in dense areas in the Netherlands (Staalduine, 2018). It is a mix between the subway and the tram and has multiple advantages to heavy rails such as trains. Light rail is as the name stated, light. Due to the minimum weight, the trains are more efficient in their stops, because they accelerate faster. In addition, the existing rail track can be used which covers the costs of the development. If there is no existing track, the light rail track is built above ground, which makes it less expensive than the subway (Staalduine, 2018).

According to the overview of the Dutch transport infrastructure social cost-benefits analyses, investing in accessibility on public transport is better on a local or regional scale than expanding the national track (Annema, 2013). Regarding the price, local investments are a better solution to improve local accessibility. However, in general, public transport investments are bringing many costs with it. The combination of rehearsed and unrehearsed costs are too high to implement station area development. In addition, it is also necessary to meet today's requirements on the environmental level. The development of station areas fails in many cases on the financial costs. The municipalities are not capable of financing the costs on their own (Bertolini & Tan, 2010). They are dependent on private investments from transportation companies and project development because the costs are only partly prepared to cover the financial risks of the development because the costs are often higher than the benefits (Loukaitou-Sideris, 2001).

Besides the costs, there are multiple stakeholders with different aims in public transport development. A multi-level government and various private organisations as project developers and transportation companies are involved. The large number of parties that have an interest will lead to a public-private partnership. Normally, the government planned and financed infrastructure projects through outlay the BDU; this is the wider goal substitution. Besides the BDU, there is a provincial and municipal fund. And finally, there is a limited possibility for infrastructure-related subsidies from the government (CROW, 2014). With a public-private partnership (PPP), between governments and private companies, the government takes the role as director. The private companies have the role to design and plan public transport but have to meet the requirements set by the government (Kerssies, 2019). By this reason, both parties are responsible for the result and carry the financial risks together. The collaboration between the different organisations will benefit the financial possibilities of the development and can turn into a profitable investment for private parties.

In addition, new public transport routes and infrastructure gives a wide range of economic benefits. Public transport investments increase the value of the land, which has a positive effect on the market value of properties adjacent to lines and interchange points (Wetzel, 2006). These form of value capture can be used to finance infrastructure projects. At the moment, many international PPPs concerning mobility developments are realised. In the Netherlands, it is still in the first stage. There is a lot of research and experiments going, but no large scale implementation (Kerssies, 2019).

1.2 Research aim and questions

This research aims to contribute to the knowledge of financing public transport projects, with a focus on the inner-city area. More specifically, the research objective is as follows: *This study gains insight into how housing can contribute to financing public transport in inner-city areas in the Netherlands*.

Following the research objective, the main research question of this study is:

To what extent can housing finance public transport investments in inner-city redeveloped areas through public-private partnerships in the Netherlands?

To answer the main question, the following five sub-questions are formulated:

1. How have public transport investments in the Netherlands been financed in the past?

This question is focused on gaining background information about public transport investments. The completed cases can give insight into the pitfalls and learning points of this development.

2. What aspects of international public-private partnerships can be applied in public transport developments in the Netherlands?

The second question aims to map the characteristics of PPPs in public transport. By looking at examples from abroad, the pitfalls and success factors become visible. This can provide guidance and give insight into the essential aspects of combining housing and public transport investments.

3. Which parties are involved in the development of public transport in inner-city areas in the Netherlands?

This sub-question has the goal to give an overview of the stakeholders that are involved in the development of public transport.



4. What are the motives for public and private organisations to engage in publicprivate partnerships?

The fourth sub-question aims to show the reasons for stakeholders to invest in public transport. The reasons behind the stakeholder's investments are essential for a continuous and reliable partnership.

5. How can the added value of public transport investments be captured in inner-city redevelopment?

The last sub-question analyses how the added value of public transport investment is established. The merits public transport investments bring to the adjacent area could be captured. The costs of investment could be more equally dispersed among the people who benefit from it.

1.3 Relevance

The relevance of this research can be explained by the problem statement described above. In this section, the scientific and societal relevance is further elaborated.

1.3.1 Scientific relevance

Until recent times, the accent was on expanding cities instead of redeveloping built city areas. Due to the relatively new change of urban planning, there is a lack of knowledge concerning reformed city areas which are dealing with modern mobility demands. In addition, the literature in the Netherlands is focused on PPPs in general (Van Ham & Koppenjan, 2001). The combination of housing and public transport through public-private transport is in most of these cases applied in Asia (Tang et al., 2010; Cervero & Murakami, 2009), where urban planning is significantly different than in European countries. In Europe, the standard way of financing public transport comes from government funds or subsidies. Only the field of governmental financing public transportation is studied increasingly over the past decades (Gwilliam, 1999; Poliak et al., 2017). This research is conducted to gain more insight into the communication and collaboration between the public and private parties in financing public transport. Hereby the focus is on the relationship between public transport investments and inner-city redevelopment. In a broad sense, there is a more in-depth research between the relationship of the concepts mobility and housing.

1.3.2 Societal relevance

As stated in the introduction, public transport is already an essential mode of transport in the Netherlands for millions of people every day (Ministry of Infrastructure and Water Management, 2019). It is crucial that public transport will develop further by becoming more efficient and sustainable. The population increases in cities, which leads to more demand for

transport in urban areas. Besides, there are stricter guidelines on environmental level, the Netherlands faces the challenge to radically reduce CO2 emissions (Ministry of Infrastructure and Water Management, 2019). Public transport developments can only be implemented if enough money is available. Nowadays, the financing of public transport-related projects cannot be entirely fulfilled by the government. The secretary-general of the International Association of Public Transport (UITP) stated that the reason behind the financial shortage of governments in Europe is caused by the Economic crisis of last decade, increasing mobility issues and environmental problems in cities (Flauch, 2014). He advocates for less dependence on the government regarding public transport investments. Thereby, there will be a more significant private role in constructing public transport infrastructure (Flauch, 2014).

As stated in the literature review, the Netherlands is in the early stages of partnerships between public and private parties for mobility-related developments (Kerssies, 2019). For this reason, it is relevant to study how public transport investments can be financed. The results of this research can be valuable for local governments to gain insight into the ways of financing public transport projects and have an added value for urban planners.

1.4 Research design

In chapter two the theoretical framework is discussed based on the literature research. Chapter three discusses the method used to carry out this research. Chapter four includes the results with regard to the sub-questions. In chapter five the conclusion follows, in which the central question is answered. Finally, recommendations are made, and there has been formed a critical reflection on the research.

2. Literature review and theoretical framework

In this chapter, the concepts that are central in this study are introduced and provided with some fundamental theoretical backgrounds. The first paragraph elaborates on the concept of public transport investments in the broader field of urban planning. Continuously, the housing concept is discussed. This chapter continues with an explanation of the financial capital. After this, the financial resources for developing public transport is explained. Finally, the conceptual framework is illustrated.

2.1 Public transport investments

As stated in the problem statement, there are multiple goals to develop public transport investment in the Netherlands. This research is focused on public transport investments in the metropolitan areas, where the focus is on the efficient and intelligent use of a limited amount of space. By financing public transport through multiple stakeholders, it is important to explore which benefits this development has. In the sections below, the two significant benefits are explained.

2.1.1 Accessibility

Accessibility, a concept used in several scientific fields such as transport planning and urban planning, plays a vital role in policymaking. However, the term is often misunderstood or poorly defined (Geurs et al., 2004). Litman (2020) gives the following definition: "Accessibility refers to people's overall ability to reach desired services and activities (together called opportunities), and therefore the time and money that people and businesses must devote to transportation (Litman, 2020, p2)".

Accessibility is frequently mixed with the concept of mobility. Mobility is strongly linked with accessibility but can be distinguished. In short, mobility is the potential for movement, while accessibility is the potential for interaction (Sharmeen, 2019)¹. The terms have different goals. Planning for accessibility is focused on increasing the ease of reaching the destination and decreasing the need for travel. On the other hand, mobility strategies focus on reducing

¹ Source from Brightspace RU



congestion or improving the time for travel (Handy, 2005). The table below shows the criteria that differentiate the concepts.

Accessibility measurements	Mobility measurements
Share of jobs or other destinations within	Level of service
specified travel times or distances	
Measures of travel options	Vehicle-miles travelled
Measures that focus on the needs of specific	Average travel time
population groups	
	Congestion measures

Table 1 Measurements of accessibility and mobility (Handy, 2005)

The concepts are also causally linked to each other. Good mobility can increase accessibility, and bad mobility can reduce accessibility (Handy, 2005). However, this is not always applicable. One of the two terms can be sufficient in a specific area, while the other is insufficient at the same time. There is much research conducted about the relationship between public transport investments and accessibility. The development of public transport increases the accessibility in the area and also meets the requirements of Handy (2005). Thus, public transport can reduce travel time, creates an extra mode of travel and ensures that people who are less mobile can move.

The role of accessibility in a city is essential. It determines the way how land is used. Good accessibility optimises the career chances of the people who are living and working in the area, which makes the city more successful (Marlet & van den Berg, 2009).

2.1.2 Sustainability

Besides accessibility, there is another relevant term related to public transport, which is sustainability. The public agenda is focused on making the world more sustainable, for example by shifting private car use to public transport. Multiple types of research confirmed that there is a need to increase the public transport system for more sustainable mobility (Zito & Salvo, 2011; Susnienė, 2012).

Sustainability is increasingly viewed as a desired goal of development and environmental management (Brown, Hanson, Liverman, & Merideth, 1987). Banister (2007) added more perspective to the concept of sustainability. He stated that sustainable development can be described from, an economic, social and environmental viewpoint (Banister, 2007). Sustainable development is always balancing on the interface between those three aspects. Besides this balance, there can be made another set off aspects. Sustainable urban development can be seen as the attempt to balance the development of urban areas on one

side and protection of the environment on the other side, regarding equity in income, employment, shelter and transportation in urban areas (Hiremath, 2013).

All modes of public transport are at this moment average to highly sustainable in the Netherlands. Trains, buses, trams and metros have a high number of travellers at the same time, with fewer carbon emissions than private car use (Ministery of Infrastructure and Water Management, 2019). Three years ago, all passenger trains switched to green energy power. There are also plans in the nearby future to provide bus transport with entirely renewable energy. In addition, the Dutch government wants Prorail, the rail infrastructure company, to consider sustainable use of building and managing the rail stations (Ministery of Infrastructure and Water Management, 2019). The above-mentioned completed and planned actions make public transport modes a more sustainable option in the future than private cars. Besides less CO2 emissions, public transport is also less spaceconsuming than car traffic (Zwaneveld, Visser, Bakker, Berveling & Korteweg, 2009).

2.2 Area development

As stated in the problem statement, the Netherlands is facing the increasing problem of a shortage of space. The urbanisation continues and 700.000 houses have to be built in the next ten years (Fokkema, 2017). Traditionally, zoning plans in the Netherlands were based on ontwikkelingsplanologie, where every aspect of the area development was blueprinted before the implementation started. The government controls the development, but collaborate in the realisation phase with other parties (Groetelaers, 2004). A follow-up and upcoming form of area development, uitnodigingsplanologie, is being used more frequently nowadays. This is a framework that is characterised by the more significant role for market initiatives (Buitelaar et al., 2012). The market itself organically fills in the area development. The government determines the main outlines of the framework, while the private and public sector is invited to shape the development. Compared to traditional ontwikkelingsplanologie, this approach is more focused on the demand side of urban planning. Due to the increased market role, the places where there is sufficient demand and financial resources available are being realised (Buitelaar et al., 2012). De Randstad, the area in the Netherlands where the demand and resources are the highest, is under pressure. The heatmap (figure 1) below shows the dispersion of pressure on the housing market by district.





Figure 1 Heatmap of the housing market 2019 (Bouwfonds Property Development, 2019).

In figure 1 can be seen that the Randstad area (Amsterdam-Rotterdam-Utrecht) is mostly red marked. Since the demand for housing in the Randstad is the highest, new and alternative options for area development must be found to meet the demand.

2.2.1 Inner-city redevelopment

Half of the 700.000 new houses are planned in inner-city areas (Fokkema, 2017). Due to the increasing housing demand, there is a need to combine existing buildings, infrastructure and mobility with the growth of citizens in a sustainable way (Fokkema, 2017). Since the start of the 21st century, there is a slow renovation of some city areas. In the Netherlands, the fifth policy document on spatial planning added new concepts of "urban renewal" in cities. City centres had to increase in attractiveness, through a combination of urban renewal and a new policy for more vital cities (Alpkokin et al., 2004). There can be made a distinction between two types of transformation locations (Buitelaar et al., 2008). First, there are restructuring locations, which are places that do not meet today requirements and have to be redesigned for the same function. Secondly, the changing function locations, which are characterised by their previous function such as a business park, military bases or station with outdated facilities. These large locations are enclosed by city aspects and have often a strategic location. Due to the geographical position, the changing function locations influence the image of the city. In practice, both types are often mixed (Buitelaar et al., 2008). However, the second type of

restructuring is more common nowadays. The urbanisation and demand for housing in the city is still increasing. Thus, inner-city redevelopment in the Netherlands will be focused to function as residential areas. It is essential that besides proper housing, people have good access to facilities and activities.

Planning inner-city development is mostly a complicated process with many stakeholders and steps. The process is ambiguous, but usually, a development plan consists of the following parts (Schütte, 2002):

1. *Development vision*: First, there will be made a vision for a specific area. The municipality usually takes the lead during this process. The vision takes spatial, social and socio-economic aspects into account and forms the framework within future plans are created. The purpose of a development vision is to create support among all parties involved.

2. *Master plan:* In larger areas, the development vision is often converted into a global Master urban plan. A Master Plan is a global urban development plan, in which the main access to the area, the main subdivision, the destinations and the preconditions are indicated. A Master plan is drawn up by urban planners and serves as a starting point for the creation of a zoning plan, which gives the plan legal status.

3. *Urban development plan:* In the urban development plan, the decisions on the programme and criteria for the area are captured. In this plan, the first visual material is created.

4. *Parcelling and design plan:* In the design plan, each subarea, is elaborated in detail level with the involved parties. Based on the parcel plan, the land distribution among the project developers takes place. Continuously, the design plan indicates how public space will be arranged.

These four steps are outlines of a global development plan, but area development in the innercity brings more complexity on multiple aspects through the stakeholders (Schütte, 2002). The paragraphs below explain how housing and transportation are initiated in inner-city redevelopment.

2.2.2 Housing

Three different types of housing can be distinguished in the Netherlands (Sociaal en Cultureel Planbureau, 2018).

- Owner-occupied houses;
- Social rent houses;

- Private rent houses.

Around 60% of the population lives in an owner-occupied house, while one-third lives in social rent houses and the remaining group live in private rent houses (Sociaal en Cultureel Planbureau, 2018). For developing an area, it is important that there is a mix of houses to meet the demand of different age and income groups.

The development of houses in an inner-city area is as stated above, complex by the high number of stakeholders (Hutton, 2004). In this paragraph, there is given an overview of involved parties in the creation of housing in inner-city areas. A distinction has been made between public and private parties. Among the public parties are the national government, the province and the municipality. Private parties include the project developer, the housing corporation and the financiers. All the parties are shortly elaborated in table 2.

Stakeholders	
Public parties	
National	The government is responsible for the spatial policy on the national
government	level. They have an interest in strengthening the economy, under the
	circumstances that there is no harm to the society or environment.
Provinces	The province is the spill between the national government and the
	municipalities. The province creates a structure in regional development
	regarding the spatial policy.
Municipalities	The municipality aims to lobby for the needs of the local community and
	pursuit the optimal use of space and sustainable development in the
	area.
Private parties	
Project	Initiates the development and carries the financial risk, intending to
developers	achieve continuity and maxim profit.
Financiers	This is a financial institution, that aims to invest the capital in real estate
	because it has a permanent value.
Housing	Originally builds, rents and manages social
corporation	rent properties. They concern the interest of public housing.

Table 2 Stakeholders of housing development in inner-city areas.

In this study the financing of housing is more in the background, the focus is on financing public transport.

2.3 Financial resources for public transport

The Netherlands wants to have a leading position in the world regarding accessibility and mobility to be part of the most competitive, liveable and sustainable countries (Rebel, 2018). However, the current design of the public transport system is insufficiency future proof to achieve these ambitions. Public transport operation and capital investment costs have grown significantly in the last decade. The demand, expectations from customers and production costs are all growing (UITP, 2013). In the Netherlands, the estimated costs show that more money will be needed to meet today challenges and achieve their ambitions regarding public transport in the future. Depending on the level and degree of customisation, the additional costs are more than 10 billion (Ministry of Infrastructure and Water Management, 2019).

The traditional way of financing public transport, financed by the government, Is no longer feasible because of the costs mentioned above. Alternative methods of financing public transport need to be developed. There are multiple options possible in the Netherlands, which are shown in figure 2.

Regular government contribution	
Extra contribution European level	6
Extra contribution national government	
Extra contribution provinces	
Extra contribution municipalities	
New area development	1ª
Contribution existing house/company	B
Contribution from operating public transport	<u> </u>
Contribution from operating car/freight transport	~

Figure 2 Alternative ways of financing public transport (Rebel, 2018)

This study focuses on new area development. With the increasing demand for housing and restructuring city areas, this option is a good opportunity for financially contributing to public transport investments. To clarify the concept, what value the public transport investment brings and how this can be captured, is explained in the next paragraph. Continuously, the cooperation among involved parties to achieve the financial contribution is elaborated further.

2.3.1 Value capturing

In order to contribute financially to investments in public transport, the value of the investments has to be captured. There are different types of value capturing, the first separation can be made between direct and indirect value capturing (Offermans & Velde, 2004). Direct value

capturing is focused on charging users for making use of the investment. In the case of public transport, the users have to pay more to travel, which causes fewer people to travel by public transport. This goes against the goal to travel more sustainable by public transport, which makes direct value capturing not suitable for public transport investments (Offermans & Velde, 2004).

Indirect value capturing, based on landowners, property owners and developers would be more efficient to achieve the goal, because it does not directly affect the passengers and the prices of transport. To answer the central question of this research, there is focused on investigating the possibilities of value capturing from developers. There are multiple ways value could be captured from developers, Offermans & Velde (2004) distinguished the following instruments.

The first type, benefit-sharing is an instrument whereby public and private actors make agreements for the distribution of profits from commercial activities that arise from public investments. Another form of benefit sharing is the remittance of all profits from commercial activities up to a certain amount, after which the remaining profits belong to the private actors. The second voluntary contribution of value capturing, the developers' contribution, includes private parties to finance the infrastructure partly. Due to the increased accessibility, they benefit from the development of public transport in the area. This corresponds to the financial return concept of Belzer & Autler (2002). The improved accessibility causes an increase in the value of land and property around the investment, which makes the developers earn back their invested money on the short or long term (Belzer & Autler, 2002). The third instrument, development rights, includes the lease or sells of land adjacent, above or under the ground from transport companies to private developers. The last voluntary instrument is liaison fee. This fee is paid by developers and property owners that wanted to have a direct link to the public transport network. This agreement is only contracted when both parties benefit from the investment (Offermans & Velde, 2004).

Besides voluntary contributions, there are state instruments that can be used to capture the value of public transport investments. These value capture instruments obtaining contributions

for the partial financing of transport infrastructure using mandatory legal powers of the government. Governments that pursue an active land policy are able to realise land value increases, sell land that is ready for construction to market parties. A part of the additional profits generated by public investment could be exploited to cover the infrastructure costs that will ultimately lead to an increase in value. Administrative guidance is a government instrument used in Japan. The costs of new area development are divided between (semi-) public parties (Tsukada & Kuranami, 1994). The third instrument is applying an operating license, which governments use for trading development plans and license to get a financial contribution of public facilities from private parties. The private investors possess the license to operate in an area, in exchange for a contribution. At last, the concept behind development levies, which works as follows. New buildings put further pressure on the transport network. A contribution is therefore required from developers for the increased costs of maintaining or even expanding the network by the government (Offermans & Velde, 2004).

Value capturing can only come together when all the involved stakeholders work together. Most of the instruments use a combination of public and private parties that collaborate. Developing public transport with multiple different stakeholders is complex, as the responsibilities of public and private partners are ambiguous and can be confused (Van Gestel, Willems, Verhoest, Voets & Van Garsse, 2014).

2.3.2 Public-private partnerships

According to Hall (2015), a public-private partnership is a contract between the government and a private company by which the private company finances, builds and operates some elements of public service. In several years it will be paid through concession or payments by the public authority (Forrer, Kee, Newcomer & Boyer, 2010). Forrer added in their definition the agreement in decision making and production where the private sector shares the risk of that production with the public parties.

PPPs are based on cooperation among governmental actors and business with the aim to pursue policy objectives (Fuchs, 2005). Well-designed PPPs can be beneficial for both parties, the public accountability remains and the private sector has its profits (Forrer et al., 2010). However, not every PPP is designed well. Many times, public-private partnerships still contribute to efficient financial arrangements and reasonable prices for projects, but undermine public accountability (Forrer et al., 2010). To counter this issue, it is essential that public actors hold private parties accountable for their actions, to have a successful PPP (Bierman & Gupta, 2011). This can be measured through multiple criteria. This study used existing literature to determine five main criteria that are necessary for a PPP where both the financial and public goals will be achieved.

Risk-sharing

The first criteria involve risk-sharing among the involved stakeholders. In general, a complex project as public transport investments is bringing many costs with it. The combination of rehearsed and unrehearsed put the developers at risk. If the costs and risks are shared, there is a greater chance of success. Risk-sharing serves as one of the main stimuli to join a partnership (Forrer et al., 2010). It has to be clear, before entering the agreement who can bear the costs if there are financial setbacks. In practice, private parties choose to enter an agreement on mutual trust, without any contractual assurance for eventual unrehearsed costs (Van Ham & Koppejan, 2001). Both parties have to know the financial risks. Proponents of the PPP have to facilitate information for risks and opportunity by example through a workshop. Professional risk workshops counter overestimation of the benefits and underestimating the risks (Sullivan, 2018).

Cost & benefits

A PPP is mostly beneficial for both parties because cost and benefits are shared based on the idea of mutual added value. The benefits outweigh the extra costs and lead to a win-win situation (Klijn & Teisman, 2003). Possible benefits from PPPs can range from increased access to resources, lower transaction costs, increased transport capacity and increased efficiency in working space (Klijn & Teisman, 2003). Many of these benefits are achieved by action on a large scale.

Social & political impacts

PPPs are mainly formed in highly populated areas, where there is a chance that the development of the project affects the environment or society (Forrer et al., 2010). This means that there is a chance of social opposition (Van Ham & Koppejan, 2001). A negative effect or mistake in the project tends to end in the news, which could involve social and political resistance. In most cases, if a mistake is made, the public parties have to take the blame because of their public accountability (Klijn & Teisman, 2003; Van Ham & Koppejan, 2001).

Expertise

One of the main incentives to agree in a PPP is the share of resources and knowledge. The public sector seeks private or non-profit partners to have a wider range of resources and expertise (Bryson, Crosby & Stone, 2006). For a PPP, it is important to have people with the right skills and insights to achieve the aims of the partnership. Depending on the type of project, the expertise varies. In public transport investments, there must be a certain amount of skills in information technology, law and management. In addition, there has to be expertise in internal partnership relations on itself. Sharing expertise takes away fears and uncertainties, which leads to a more successful partnership (Forrer et al., 2010).

Partnership Collaboration

Good collaboration among parties is essential. This includes effective leadership, recognising which roles are needed in what phase of the project and which actor fills in these roles (Forrer et al., 2010). Besides, there has to be open communication and transparency among the actors to trust each other. The component of trust is important for a successful PPP. Trust is build up during the process and is not a phenomenon that occurs overnight (Forrer et al., 2010).

2.3.3 Relationship between value capturing and public-private partnerships

The following (figure 3) is an overview of the characteristics that a PPP must meet to be successful.

Theories	PPP dimensions	Indicators
	Risk sharing	Clearness risks/benefits Agreement risk distribution
×	Costs & Benefits	Proliferation of resources Distributing the costs
Theories about value capture instrument	Social impacts	Effect on the environment Social resistance
(voluntary contribution/	Expertise	Increased knowledge Increased experience
	Partnership collaboration	Distribution of roles Clear communication Mutual trust

Figure 3 Operationalisation of value capturing theories through PPPs in inner-city redevelopment

This study explores which forms of value capture instruments are useful for inner-city redevelopment through PPPs. The theories discussed in paragraph 2.3.1 are used as a basis for value capturing the benefits of public transport in inner-city redevelopment areas. At the moment, it is unclear which form of value capturing is the best to use by area. The dimensions of PPP are elaborated in 2.3.2, which can be useful to have an overview of the requirements for the success of PPPs. The dimensions can be measured through multiple indicators.



2.4 Conceptual framework

To conclude the theoretical framework, it is important to examine the relationships among the relevant concepts for this research in a conceptual framework. A conceptual framework provides direction and guidance in this research.



Figure 4 Conceptual Framework

Explanation of the conceptual framework

This study examines how public transport investments are financed within an inner-city area. This framework is divided into three phases.

Phase 1

The housing in inner-city redevelopment is financed by local/national government and private companies, that work together in a PPP partnership. The PPP has a positive effect on the financial capital variable.

Phase 2

The increase in financial capital can influence the implementation of public transport investments. Due to the new public transport investment, accessibility and sustainability could improve, which leads to an increase in the quality of life in inner-city areas.

Phase 3

The positive externalities of public transport investments are translated into financial values as the price of land and real estate around the developed area increases.

Phase 4

The captured value finances the investments costs of the stakeholders involved in the PPP.

3. Methodology

A clear and comprehensible methodological approach is needed. First, the research strategy and design are elaborated. Next, the research methods, data collection and data analyses are processed. Continuously, the selection of the cases is explained. At last, there is explained how the core principles of validity and reliability are embedded in this study.

3.1 Research strategy and design

The ultimate goal of this study is to answer the main question: *To what extent can housing finance public transport investments in inner-city redeveloped areas through public-private partnerships in the Netherlands*? To answer this question, there is a strategy and design set up. Doorewaard & Verschuren (2015) distinguish three different types of research characteristics. One has to choose out of these. The three choices are between broad/ indepth research, empirical/theoretical research and qualitative/quantitative research (Verschuren & Doorewaard, 2015). In this study has been chosen for qualitative empirical research with in-depth interviews. Qualitative research aims to investigate the problems of situations, events and persons to describe and interpret (Reulink & Lindeman, 2005).

In qualitative research there are five options regarding the strategy, which are the following (Creswell, 2003);

- Narrative research;
- Phenomenological research;
- Grounded theory;
- Ethnographic research, and;
- Case study.

This research has used the last strategy, the case study. Advantages of a case study are the possibility to do in-depth research and view the issue from multiple perspectives (Reulink & Lindeman, 2005). The choice to use a case study is made because of the limited amount of inner-city redeveloped areas in the Netherlands. The number of cases that are currently suitable for research can be counted on the fingers of one hand. Due to this reason, it is more valuable to do in-depth research.

In this study, there was chosen for a comparative hierarchical case study. This subvariant of case study research which is characterised by the separation of two phases (Verschuren & Doorewaard, 2015). In the first phase, the researcher examines the individual cases in a series of single case studies. Hereby it is essential that the researcher conducted every case independent from the other cases. All the collected data from the individual cases is used for a comparative analysis in the second phase of the case study (Verschuren & Doorewaard,

2015). The comparative hierarchical case study helps to gain insight into how housing can contribute to financing public transport in inner-city areas in the Netherlands. The three different areas give an overview of diversity in aspects of housing that can contribute to public transport. Besides, there is made a comparison which leads to a more representative answer to the research question.

3.2 Research methods, data collection and analysis

In the Netherlands, as stated in the scientific relevance, there is not conducted much research about the financial possibilities between housing and public transport in inner-city regions. By this reason, most of the data is empirical. Yin (1994) distinguishes six different sources for case study research. These are archival material, documentation, direct observation, participatory observation, physical material and interviews (Yin, 1994). In this study, there is chosen for archival material and interviews. The researcher combines these sources of information to describe the case, concepts and themes that are connected to it (Creswell, 2006). This method is chosen as the research consists of clearly identifiable cases and asks for an in-depth understanding of these.

The first two sub-questions are mainly answered by desk-research. These questions focus on the history and international context of housing and public transport relationship. Archival material can provide supplementary research data, and the information and insight derived from the studied documents is a valuable addition to a knowledge base (Bowen, 2009). The possible disadvantage of researching through document analysis is a biased selectivity, the available documents are aligned with the preferred results as well as the access to other outcomes is blocked (Bowen, 2009). Document analysis includes skimming through documents, continuously read and interpret the documents (Bowen, 2009).

Besides desk-research, the primary data is collected through interviews. The subquestions three, four and five are answered through the results of interviews. During the period of research, there were isolation measures to contain the spread of COVID-19, which means that face-to-face fieldwork was not conducted (face-to-face interviews, focus groups, participant observation, ethnographies). Researchers are now facing the challenge to gather their data differently. Face-to-face interviews are not feasible, but there are online tools to conduct an interview, for example through a skype conversation.

Interviews are one of the essential sources in case study research. Interviews can be open, semi-structured or structured. The advantage of interviews is that they focus on the case study subject and offer new insights. A disadvantage is that the quality of the information depends on the quality of the questions and answers. For example, there may be an incomplete memory or the interviewee says what the interviewer wants to hear (Yin 1994).

The interviews are semi-structured, using an interview guide with interview topics. This is an interview method that allows the interviewer to address core aspects in a self-definable order and formulation. At the same time, there is space within the interview topics for the interviewee to answer in his or her own words. In addition, semi-structured interviews offer space for questions formed during the interview or supplementary questions from the interviewee (Vennix, 2011). The key aspects that are addressed in the interviews are selected based on the variables that are reflected in the conceptual model (figure 4) and further elaborated in the theoretical framework.

For this study, it is important to conduct interviews with multiple stakeholders in the process to gain insight from different perspectives. In all the cases, the municipality takes the lead from the public side, which makes them an interesting object to interview. From the private parties, there are the project developers which were interviewed by case. In addition, an interview with the operating public transport company was also arranged.

Table 3 mentions the persons that have been interviewed. All the interviews that were conducted are in Dutch. Citations retrieved from the interviews are translated into English, with the highest prudence, to prevent that the own interpretation of the author is reflected in the citations.

Name of interviewee	Involvement in cases	Background
Gerard Boot	Binckhorst	Financial director HTM, the local
		operator in The Hague
Bastiaan ter Horst	Binckhorst	Mobility manager municipality of The Hague
Hugo de Haes	Binckhorst	Projectmanager Public Transport of Metropolitan Region The Hague - Rotterdam
Desirée Uitzetter	Binckhorst, Merwede	Director Gebiedsontwikkeling BPD
Micha Sijtsma	Haven-Stad	Mobility manager municipality of
		Amsterdam
Bart Heinz	Haven-Stad	Projectmanager Ministery of infrastructure and water management
Geert Fleuren	Merwede	Project developer AM



Martijn Stemerdink	Merwede	Project developer Janssen & de Jong
Finn van Leeuwen	Merwede	Mobility advisor municipality of Utrecht
Martin van der Does de	Binckhorst, Haven-Stad,	Project manager and mobility expert
Вуе	Merwede	of REBEL group

Table 3 List of interviewees

Regarding the data analysis, the conducted interviews were transcribed and coded. The audiorecordings of the interviews were transcribed with the help of Otranscribe. In this program, the audio file can be simultaneously paused while typing. Continuously, the transcripts are processed in the coding program Atlas.ti. This is a transparent and systematic coding program. Besides, Atlas.ti helps to discover new relations between concepts that were missed during the interview (Murray-Carlsson, 2018)². The approach of coding is deductive of nature. The operationalised dimensions and indicators of value capturing theories through PPPs explained Figure 3 serves as an analytical model. At first, open coding was applied to analyse the results of the interviews. Secondly, selective coding was used. Thereafter, the codes are categorised using the indicators of figure 3. The coding continued with the allocation of the codes to code families.

3.3 Case selection

Case selection is a task of the researcher, that ranks as the primary task before the collection of data. By choosing a case, the researcher frames the subject and draws an agenda for studying the selected cases. An important point of attention is the representativeness in case selection (Seawright & Gerring, 2008).

As stated in paragraph 3.2, there is chosen for a hierarchical comparative case study. Thus, the research is conducted in two phases: first of all, independently of each other, the cases have been selected which have the following similarities:

- Adjacent to a metropolitan area
- Former industrial area/military area
- Open attitude to new financing alternatives
- Focused on public transportation

In all the cases, a similar independent patron for conducting the research is followed. There is attempted to perform the same number of interviews in every area. The results of the interviews

² Source from brightspace RU

are compared with each other, and similarities and differences are shown. The following cases are chosen based on the four characteristics above.

The Binckhorst is located near the centre of The Hague. The plan is to build 5.000 houses and additional facilities (Gemeente, Den Haag, 2020). Secondly, Haven-Stad, which is the most substantial redevelopment area, where there is planned to create a neighbourhood with 40.000 to 70.000 houses in the coming 30 years (Gemeente Amsterdam, 2020). At last, the case of Merwede in Utrecht is researched. 6.000 homes are scheduled to be built here (Gemeente Utrecht, 2019). The cases are further elaborated in paragraph 4.3.

Figure 5 mapped out where the cases are located.



Figure 5 Map of the three locations and development plan (Gemeente Den Haag, 2019; Gemeente Amsterdam 2017: Gemeente Utrecht, 2019).

3.4 Validity and reliability of the research

Validity can be described as a determination whether the study truly measures what is intended to measure. In other words, how truthful are the research results (Joppe, 2000)? Based on the three cases that were studied, there could be drawn no conclusions regarding the validity of the theories in other similar cases. There is no possibility for statistic generalisation. However, one case could be sufficient to strengthen or weaken a theory and give insight into the theory without generalisation (Yin, 1994). Multiple cases could, or comparative cases in academic literature could enhance the degree of generalisation (Babbie, 1995). Other resources state that terms as validity and reliability only function well in quantitative methods, while the terms credibility, confirmability, consistency and applicability are essential criteria for qualitative inquiry (Lincoln & Guba, 1985).

However, other researchers stated that validity and reliability could be useful for qualitative methods. In a qualitative approach, the methodology strongly determines reliability. A combination of sources increases the reliability of the methodology by means of triangulation (Babbie, 1995). In short. The reliability is the possibility of repetition and redoing the same research, according to Vennix (2011). This aim can be achieved through triangulation. According to Vennix, triangulation is the comparison of different data sources (Vennix, 2011). In this case, this means that the information obtained from the available documents (existing secondary sources) is compared with the information obtained from interviews with public and private parties (primary sources). In addition, triangulation is used to evaluate in order to control bias and invalid propositions during this study (Mathison, 1988). In this thesis, there is made use of triangulation in the following way. Multiple policy documents of each of the chosen areas are studied. After the desk research, the interviews were conducted. Thus primary and secondary data has been applied in order to increase reliability.

Findings from qualitative research can be reinforced in this way. Reliability also increases if the methodology is applied to multiple cases. That is why a multiple case study and data triangulation has been chosen to increase reliability and generalizability. After all, this increases the validity of the research.

4. Research Results

This chapter contains the results and analysis of the collected data to answer and understand the sub-questions. In order to obtain answers to the first sub-question, in section 4.1, the background information on financing public transport is obtained through extensive literature research. Second, in section 4.2, the international aspects of PPP in public transport are pointed out. Continuously, the cases are included to provide an answer on sub-question three, four and five. Section 4.3 provides a case description and insight into the developments task for each area. Various policy documents and interviews were used to describe the cases. Continuously, section 4.4 compares the three described cases with each other.

4.1 History of financing public transport in the Netherlands

The Netherlands has a long tradition of innovations in public transport. First, in the seventeenth century, there was a public transport network through connected waterways (Ministry of Transport, Public Works and Water Management, 2010). More recent, in 1970 the Dutch were the first country in Europe that developed a national symmetric rail service. A decade later, the Netherlands was the first that introduced ticketing on a local and national level for public transport (Ministry of Transport, Public Works and Water Management, 2010). Nowadays, the Netherlands still wants to have a leading position in the world regarding accessibility and mobility to be part of the most competitive, liveable and sustainable countries (Rebel, 2018).

Anno 2020, the Dutch government has the responsibility for the infrastructure, which means that they have to manage and maintain the rail transport (Ministry of Transport, Public Works and Water Management, 2010). ProRail, a public enterprise, carry out these functions. Prorail is a private limited liability company where the national government is the only stakeholder. The Ministry of Infrastructure and Water Management performs all the functions that are included from the shareholder functions (Government of the Netherlands, n.d.). Besides rail transportation, public transport consists of buses, metro and tram. These modes of transport are the property of the road maintenance authority, which is in many cases public (municipality, province or central government). The metro and tram are sometimes indirect property of public parties. This is when a private company in which the government is the sole shareholder (Ministry of Transport, Public Works and Water Management, 2010). In the Netherlands are a few exceptions, where the privatised municipal transport companies provide the local public transport. Table 4 shows which parties have authority on which scale.



Level	Authority	Granting concession	Exploitation
National	Central government	Mainline rail network	infrastructure
		HSL South	manager (ProRail)
			operator (NS)
Metropolitan, urban	12 Provinces	Provinces and the	Bus/Tram/Metro
and regional	7 Regional PTE's	Metropolitan region	Regional Railway
			Services

Table 4. Based on the Dutch public transport organisation chart (Ministry of Transport, Public Works and Water Management, 2010)

In general terms, public transportation is in the hands of multiple layers of public parties. The government grants concession to public transport exploiters, which gives them the resources to finance the electricity, staff and vehicles. However, the construction of the infrastructure is still the responsibility of the government. They can decide if, where and how the development takes place (G. Boot, personal communication, May 19, 2020). The government utilises the infrastructure fund for this kind of developments. The resources of this fund are already reserved for future projects until 2028 (Studiegroep Alternatieve Bekostiging, 2020). The financial resources of this fund for new investments are thus scarce. Besides, the rising costs of management and maintenance of existing infrastructure cause an even smaller budget that is available for new investments (Studiegroep Alternatieve Bekostiging, 2020).

In addition to the infrastructure fund, the national government's contribution to regional public transport is provided via the Wider Goal Substitution for Traffic and Public Transport (BDU). Municipalities do not receive BDU, but can request a contribution from the province or city region. The national government determines the height of the BDU and the division between urban regions and provinces (Koopmans, C., van Buiren, K., Hof, B., & Smits, T., 2013). The BDU for each city-region and province consists of a relative and an absolute part. The relative part is determined on structural characteristics such as the number of addresses (houses) in the region. The absolute part is used for incidental contributions, such as for the introduction of the *Ov-chipkaart*. The BDU is not solely reserved for public transport. It can also be spent on other parts of the mobility policy. The provinces and city-regions have the jurisdiction of the distribution of the BDU over different forms of mobility. They sometimes use fixed distribution keys between public transport and other transport modes (Koopmans, et al., 2013).

Sub-conclusion

Regarding the financing of public transport investments, there can be stated that the Netherlands is to date, dependable on the contribution of the government. The financial

contribution of the national government divides further into more specific layers within the government. Untill now, this way of financing was sufficient. However, the historically high quality of rail transport of the Netherlands and new challenges as urbanisation and climate change, there is a demand for more public transport than the government can develop with the available resources. A possible solution could be to strengthen the private role in constructing public transport infrastructure (Flauch, 2014). A changing role of private and public parties could be achieved in different ways. Internationally, there are many examples available which are elaborated on in the next paragraph.

4.2 Epistemologies of PPP in public transport developments abroad

Public transport is used all over the world, but the way it operates and how the infrastructure is developed differs among countries. There is generally a strong link between the way funding is organised and the institutional set-up of a country (Studiegroep Alternatieve Bekostiging, 2020). This means that the way of developing infrastructure is not always applicable in the Netherlands. However, looking at international public transport systems gives insight and experiences that can help to find opportunities on how public transport in the Netherlands can be developed. Three of these developments that stand out are described below.

As stated in the literature overview, there is a transit-oriented development in Hong Kong, with the company facilitating the metro receiving land grants instead of subsidies. Due to the land grants, they can develop the area which increases the value and can be sold later on for a higher price (Cervero & Murakami, 2009). In a survey of Hong Kong and Mainland Chinese professionals with PPP experience determined the most significant risks concerning public transport investments through multiple parties. Government intervention was identified as the highest-level risk (Luan, Lin, McGuinness & Yang, 2014). Poor decision making of officials came in second, followed by financial risks, unreliable government, and market demand changes. The government is thereby a critical stakeholder among the most significant constituents of what could go wrong in a PPP (Luan, et al., 2014). In Hong Kong, private parties have more control in the development in comparison with the Netherlands. In Hong Kong, the project developer is focused on making profit, which leads to a selective development of public transport lines (Allport et al., 2008). Public transport development requires strong political control, clear objectives, leadership, and institutional effectiveness during implementation and operations (Allport, Brown, Glaister & Travers, 2008). The institutional layers can determine the way of financing the infrastructure.

In London, it had been clear for decades that the physical and economic growth of the city needed a significant boost in public transport capacity. The local authorities decided to build a new underground public transport line across the city, named Crossrail. Realising this

investment would cost around £15 billion (Zoest & Daamen, 2020). The public funds were insufficient to pay the total investment. Two-thirds had to be raised locally. This amount was achieved through the use of innovative instruments, of which the Business Rate Supplement (BRS) is the most striking. The London business community quickly came into the picture as the leading group of beneficiaries of Crossrail, partly because the route connects the two main business centres and the airport. The local authorities entered into extensive discussions with businesses. The business community realised that the project could make a significant contribution to the growth of the city and their business activities. Due to the economic benefits, they were willing to engage in a partnership (Zoest & Daamen, 2020).

The role of the British government in the development is also worth mentioning. They facilitate and sponsor the development, while the project developers take the leading role. This type of development usually involves a sharper contractual public-private division of roles. The negotiating practice of the British does lead to much more precise results of tensions in quality, price and program. Due to the specific result, there is a relatively stable framework where there are favourable conditions for companies to make risk calculations and a conclusive business case (Studiegroep Alternatieve Bekostiging, 2020).

Denmark also has a unique public transport realised by the development of Ørestad. In the city of Copenhagen is a development partnership formed which is 55% owned by the city of Copenhagen and 45% by the Ministry of Finance (Studiegroep Alternatieve Bekostiging, 2020). This development partnership was responsible for the area development and the construction of the infrastructure. The goal was to sell out building sites along this new subway line, especially targeting high-paying multinational private firms (Majoor, 2008). As a result, the income from land and property developments could be used for the construction of the subway. This development connects Ørestad to the centre of the city. The realisation was possible because the government owns all the land. The area consists of a military training ground and a public harbour company (Studiegroep Alternatieve Bekostiging, 2020).

The partnership that was made for this development was a way to share risks and profits, but at the same time, creating a dependency between two different stakeholders. This alliance made around the development of the metro was a way to share risk and profit, but at the same time, it provoked a dependency between the two actors. Without the subway, there would be no Ørestad. The city and the subway became heavily dependent on each other. By showing the urgency of a subway and the new bridge to Malmø, the government tried to evoke an image of connectivity, to create a global setting (Majoor, 2008).

Sub-conclusion

Based on the three international examples, several aspects emerge that could be useful in partnerships in financing Dutch public transport. In both Hong Kong and London, the private parties have a leading role in the development. By the government being more facilitating in its role, more freedom is provided to private parties. This leads to an increase in financial capital, as private parties are more willing to put money on the line. Besides the shift in roles of the government and private parties, more aspects explain the success of the PPPs. In the cases of Hong Kong and Ørestad became evident that it is crucial who is in control of the ground. If the government owns all the land, they have a means of exchange for the financial capital of the private stakeholders (Majoor, 2008).

4.3 Case study results

This chapter presents the findings of the multiple case study. The three cases, Binckhorst, Haven-Stad and Merwede, are dealt with one after the other. First, the case redevelopment task is described, thereafter the stakeholder's involvement is analysed. The paragraph continues with the possibilities for PPP. Finally, value capture practices are discussed.

4.3.1 Binckhorst, The Hague

As stated in the case selection is Binckhorst one of the areas planned for redevelopment. For explaining current developments, it is important to look at the history of the Binckhorst. Binckhorst is an area that experienced different waves in planning. In 2008, the municipal council adopted a grand and compelling master plan, entitled "Nieuw Binckhorst". The program was to create 7.000 houses, 1 million m2 of economic functions and a city park of 16 ha. The municipality of The Hague embarked on a public-private partnership together with BPF Bouwinvest and Rabo-Vastgoedontwikkeling to realise the master plan, with a time horizon of 25 years (Zeeuw, 2018). In the meantime, the crisis has hit the economic sector. The Land exploitation had a deficit of \in 200 million. In 2011, the municipality made a radical change with the Binckhorst area and chose for small-scale and bottom-up initiatives (Zeeuw, 2018). The demand for housing increased in the following years. The municipality of The Hague wants to meet that demand by planning for more housing. Besides, developers acquire land positions and make building plans. In the Binckhorst, due to this trend, a more directing and systematic role by the municipality is needed. Thus they go back to a more top-down approach with bottom-up elements (Zeeuw, 2018).

Nowadays, the plan is to transform the former business park into an urban residential workplace. In the next few years, 5.000 homes will be built here in the first phase. Existing

businesses and entrepreneurs will meet new users and residents. At this inner-city location, residents, entrepreneurs, the municipality and various market parties are working together to create a high-quality new urban living and working environment.

Figure 6 shows the planned transition of the area. In the middle of the area, there is a plan to develop a High-quality public transport line (HOV) which connects Binckhorst to other parts of The Hague. Binckhorst is part of the *Koningscorridor*. This corridor connects prime economic locations and facilitates urbanisation.



Figure 6 Overview of the transition of the Binckhorst (Gemeente Den Haag, 2019)

Roles and decision making

Inner-city redevelopment is a complex process with many stakeholders that have different roles. To get a better understanding of how decisions are made, it is crucial to look at which stakeholders are involved and what their role is.

The municipality takes the lead in the development and the initiative for decision making. However, the redeveloped area is under the territory of several municipalities. The municipality of The Hague takes the lead, but the municipalities of Leidschendam-Voorburg and Rijswijk are part of the negotiations (H. de Haes, personal communication, June 23, 2020). In The Hague region, there is a unique collaboration for developing public transport. There is a collaboration among MRDH, HTM and municipality of The Hague named OV NEXT. The role of this collaboration is to organise efficient and target-oriented cooperation and decision making in developing public transport. Besides this collaboration, all municipalities in The Hague region, NS and ProRail are affiliated by OV NEXT.

When the knowledge and experience are not available among the involved parties, there are tenders for experts. If the municipality of The Hague wants to carry out a specific study, they reach to a purchasing organisation. "*It is not the case that someone from the municipality is already sitting at our table as a purchasing advisor by default. As the situation arises, the question is put to the parent organisation, and further preparations are made*" (H. de Haes, personal communication, June 23, 2020).

All these stakeholders have to work out the plan collectively. The decision making is layered. First of all, a substantive plan is drawn, which is often accompanied by advice. Continuously, this plan is sent to an official administrative group. This perspective is then raised one level higher each time. After that, the directors are consulted, and ultimately the decision making is at the political level (H. de Haes, personal communication, June 23, 2020).

In addition, the new *omgevingswet* causes complexity and unclearness in decision making. The Binckhorst serves as an experimental area for the *omgevingswet*. Due to this law, there are fewer restrictions and no clear framework in the way how stakeholders have to work together. They experience no overriding leader that has the overview and control. This lack of clarity is shared by both public and private actors (D. Uitzetter, personal communication, June 9, 2020).

The next paragraph elaborates further about the stakeholder's relationship and their motives for collaboration.

PPP opportunities

A decade ago, the Binckhorst failed to develop the area through PPP. The recession has clarified the problems, but even in better times, this development method failed. The question can be asked whether the municipality and private parties were sufficiently involved in each other work before they started their joint adventure in the area. (Kanneworff, 2011).

As stated in the paragraph above, the plan for Binckhorst is to implement a more top-down approach with bottom-up elements (Zeeuw, 2018). With this approach, a new sort of PPP arises. This form, Developing Apart Together (DAT) is also called Joint Venture Ultralight (Zeeuw, 2018). In this partnership, the public and private stakeholders are jointly responsible for the development of the central structure and public space. Within this structure, developers

are responsible for their own plot (D. Uitzetter, personal communication, June 9, 2020). There is chosen for the DAT approach because it turned out there is much investment interest and fragmented land ownership. In addition, there is a part of the current users that want to keep the unpolished, raw characteristic of the area (Zeeuw, 2018).

One of the advantages of a PPP is that the costs and risks can be divided among the stakeholders. However, before dividing the risks, it is essential to indicate the main risks in developing the Binckhorst area. The first risk that stands out is the financing of the development, because there are several unexpected expenses. The other risk is the failure to implement the development plan. For example, through a lack of permits. In the Binckhorst are permits from four different municipalities needed to execute the development (G. Boot, personal communication, May 19, 2020).

In the Binckhorst, it is not clear yet how the risks are divided for developing public transport. If certain risks cannot be linked to a specific party, then it is a matter of agreeing in advance how to deal with those risks. In practice, this often means that the investment sum will be paid through different parties in different proportions. "One pays 10%, the other 20% and the other 50%, so they make sure that together they come to 100%. It is often the case that it is also agreed that if there is a risk, it will be passed on to the financiers in the same proportion" (H. de Haes, personal communication, June 23, 2020).

Financial construction

Developing public transport is expensive, especially in a high-density area. There has to be dealt with large parking garages, high-rise buildings and high-quality requirements. Besides, there is a certain degree of sustainability and safety, which are set by the municipality (M. Stemerdink, personal communication, June 5, 2020). Financing these high costs for development is currently even more difficult.

At the moment the Coronavirus pandemic is still trapping the world. This crisis influences the financial resources that are available for development. The number of passengers in public transport has been decimated this year. Next year will be uncertain if the reduction of passengers will stop (H. de Haes, personal communication, June 23, 2020). However, the number of passengers is expected to return to its previous level in the coming years. Then the growth in passenger numbers may continue, but that is difficult to predict at the moment (H. de Haes, personal communication, June 23, 2020). On top of that, there is a reasonable chance that the underlying mechanism of urbanisation and sustainable transportation will continue in the long term (G. Boot, personal communication, May 19, 2020).

Financing the infrastructure also plays a role in the collaboration reasons of the parties. For example, the mobility interventions in the Binckhorst cost around €500/600 million. This

amount of money can none of the parties pay on their own (B. ter Horst, personal communication, May 19, 2020) Financial contribution is available from central government, the province of Zuid-Holland, the MRDH and the municipality of The Hague. However, the financial coverage of the entire development is not clear. There are alternative possibilities in the Binckhorst to acquire more financial capital for developing public transport.

In the Binckhorst, alternative funding could cover one-third of the total costs of the public transport investment (B. ter Horst, personal communication, May 19, 2020). There are two different funding packages, a regional and local package. The regional package includes the MRDH, HTM and Municipality of The Hague. For example, they can create an access fee and promote the area for more income. The local package, which is from the municipality of The Hague, knows more opportunities for alternative funding. They can get profit from the growth of the city, exploitation of mobility through increasing revenue from parking or public transport. In addition, real estate can be useful for alternative revenue through an accessibility fee, or a commutation of the central parking place.

The total revenue of these packages is clear, but the challenge is to implement and manage the instruments. At the moment, the potential of these instruments is being recalculated. After that, a choice has to be made which ones are executed. The knowledge is there; the next phase is about to start. *"Now it comes to the point of being able to build a cooperation between the market and the government on that basis*" (M. van der Does de Bye, personal communication, June 16, 2020). The instruments with the most potential for implementation are mentioned below.

Developers in the Binckhorst have to pay a certain amount of money to contribute to the public space. At the moment, all the developers only pay for the adjacent environment to the houses they build (M. van der Does de Bye, personal communication, June 16, 2020). For example, a sidewalk in front of the house. Every developer has a limited circle in which they contribute. However, there is a plan to enlarge the circle and collaboratively contribute to the area (D. Uitzetter, personal communication, June 9, 2020). This form of alternative financing is called an Area Investment Zone (GIZ).

There is also a possibility to raise the tax for citizens. This is called the resident tax, in Dutch the *ingezetenheffing*. Each inhabitant or household pays a certain amount of money which can be collected into a fund to use for the development. However, not everyone benefits the same from the developments, while every citizen pays an equal amount of extra taxes for a development. New public transport in the Binckhorst is beneficial for the inhabitants closeby, but somewhere in the southwest of The Hague, no one benefits from the development. The usability of the instrument is now under review in the Binckhorst. Experts are now investigating whether it is possible to differentiate the amount of tax based on the benefits (M. van der Does de Bye, personal communication, June 16, 2020).

In addition, lowering the parking norm could lead to a financial contribution to the public transport network. In a dense area as the Binckhorst, every meter of space counts. When there are less parking spots, the developers can build more houses which gives them a higher profit. A part of this profit can be reserved in a mobility fund, which can be used for developing public transport in the area. The above instruments are further elaborated on paragraph 4.4.3.

4.3.2 Haven-Stad, Amsterdam

The municipality of Amsterdam has plans to create a new neighbourhood. This former harbour/industrial area will be transformed for living and working. The mobility focus will be on sustainable transportation. Only 15% of the transportation will be made by car. Other transportation modes as public transport will play a more important role in the life of the inhabitants of Haven-Stad (Gemeente Amsterdam, 2020). It is all about realizing an entire piece of the city. In Haven-Stad living, working, studying, recreation, shopping take place in each other's direct proximity.



Figure 7 Overview of the transition of Haven-Stad (Gemeente Amsterdam, 2017)

Figure 7 shows the development plan for the area. The orange line around the water in the figure is the rail for High-quality public transport (HOV). A good HOV bus connection in the

area is necessary to be well accessible and to make developments possible. A fast and reliable connection is expected to be able to cope with transport demand for a considerable number of years (Gemeente Amsterdam, 2017). There is chosen for a bus mode of transport because the preparation and realisation of a subway line takes about fifteen years. The subway could be the mode of transport in the long term. However, at the moment, it is not sure if the subway will be profitable. Due to the flexible program, it is possible to upgrade the bus by tram transport, if the subway development turns out to be not cost-efficient (Gemeente Amsterdam, 2017). There is an overview provided of all the parties involved in paragraph 4.4.1.

Roles and decision making

In Haven-Stad, the government operated from the SBAB programme "Samen Bouwen aan Bereikbaarheid". This is a joint program of the region and the state for the integral development of accessibility in the entire area (B. Heinz, personal communication, May 14, 2020). In this process, the municipality of Amsterdam is the principal of Haven-Stad. The alderman for spatial planning is the administrative principal under the management of space and sustainability. That includes the entire Haven-Stad programme team that is about 20/30 people who work on the Haven-Stad development every week. There are steering committees, meetings with the alderman for spatial planning, the alderman for traffic, the alderman for the harbour (M. Sijtsma, personal communication, May 29, 2020). The Vervoerregio Amsterdam also plays an essential role in developing public transport in Haven-Stad. They grant the concession for public transport exploitation (M. Sijtsma, personal communication, May 29, 2020).

Besides the role of the government, there are more stakeholders involved. The proximity of Schiphol Airport influences the development. Haven-Stad, Schiphol and Hoofddorp can be seen as one extensive mobility system, in which Haven-Stad serves as the final closure of the small metro ring (B. Heinz, personal communication, May 14, 2020). By developing public transport in the area, there is a chance that it can substitute short-haul flights. This leads to an advantage for Schiphol, because they have more space to execute long-distance flights which are more profitable (B. Heinz, personal communication, May 14, 2020). Due to the benefits of Schiphol, there is a higher incentive to develop High-quality public transport in Haven-Stad.

PPP opportunities

The interviews did reveal that there is not always the possibility to engage in a PPP. The innercity area has already been built, which makes it more challenging to develop. As stated before, the municipality is the initiator and client in Haven-Stad. They give shape to the new livingworking location, i.e. in terms of planning. In many cases, the city of Amsterdam owns the land and gives it over to developers via ground lease, utilising implementation agreements. As a result, a developer uses the land and then realises the houses (M. Sijtsma, personal communication, May 29, 2020).

The issue for engaging in a PPP for Haven-Stad is that the private sector owns most of the land. "*It is not like developing on a meadow where there is a cooperation formed with the government and private parties*" (M. Sijtsma, personal communication, May 29, 2020). Due to the limited amount of land ownership in Haven-Stad, the municipality is not able to force incumbent parties to leave. In Haven-Stad are many port activities, particularly in the higher environmental classes, that cannot remain in place. The plans of redeveloping Haven-Stad are well-known for a long time, so agreements with heavy industry are already made. At the same time, various companies can stay in place, and they can be mixed with housing. For example, a DIY-market which remains the bottom structure and on top of the building, there will be apartments (M. Sijtsma, personal communication, May 29, 2020).

In 2019, the Urban Land Institute (ULI) researched the possibilities to accelerate the development of Haven-Stad. In the research came forward that is not clear which organisation is responsible for the realisation of Haven-Stad. If coordinated leadership is not implemented in the future, there will be issues regarding the transferability of the project and the guarantee of investors (Urban Land Institute, 2019).

Financial construction

The financial management is based on land operations by subarea. The starting point is to invite landowners and developers/investors to join the development. Investments in (suburban) infrastructure, water and public space takes place from different sources, including the Mobility Fund, the subsidy of the Transport Region and land-based exploitation of adjacent subareas. The Mobility fund and subsidy of the Transport region are both financial contributions granted by the government for the development of the infrastructure. Land exploitation from surrounding areas is profitable for the municipality by making the ground available for housing or business activities. For additional funding, there are opportunities at the provincial and national level for Haven-Stad. However, there is no investment decision been taken and certainly not discussed how the allocation of the finances will be planned.

The mode of transport has a significant influence on the costs of developing public transport. In Haven-Stad, the plan is to extend the subway link through the area. It services as the gateway of the small metro ring and that is important in the network (B. Heinz, personal communication, May 14, 2020). Despite the high costs of the investment, it also produces many benefits. The future residents and surrounding neighbourhoods are the ones that benefit the most by the increase in travel options due to an expansion of the network (B. ter Horst, personal communication, May 19, 2020). At this moment, there is not yet made a plan to gain income from beneficiaries in Haven-Stad. The costs of public transport will be elaborated further in paragraph 4.4.3.

4.3.3 Merwedekanaalzone, Utrecht

This former military/industry area will be restructured for housing. The area is also a project where new forms of financing are applied. The plan is to create a mixed-use city centre area, with car-free public spaces. The sorts of housing are 45% commercial property, 25% average rent and 30% social rent. In contrast with the other two cases, there is a form of public transport present. However, with the increase in households, there are plans to invest in public transport to provide the area with high-quality public transport connections (Gemeente Utrecht, 2019).

Figure 8 shows the different areas that are going to be developed. The transition of Merwedekanaalzone is divided into three areas. Subarea three, four and five. The last of the three is the most extensive development. A total of 6,000 homes will be built in subarea five, with 100,000 metres of all kinds of amenities; schools, shops and restaurants. 1.800 parking spaces will be provided for the entire program. The highest densities of housing and public functions are created around public transport nodes. This stimulates the use of public transportation.



Figure 8 Overview of the transition of Merwedekanaalzone (Gemeente Utrecht, 2019)

Roles and decision making

As described in the cases of Binckhorst and Haven-Stad, the municipality takes the lead. This is in Merwedekanaalzone the same, but the municipality has two different roles. A public one, where they set ambitions and safeguard the interests of society in the development (G. Fleuren, personal communication, June 3, 2020). The municipality of Utrecht has the landownership over a part of the area. Due to their land ownership, a department of the municipality also acts as a private developer in the decision-making process.

There is also a discrepancy in interests within the municipality. The policymakers are focused on the theoretical side, while in negotiations with the other stakeholders, the aspiring policy is not feasible. Often is this discrepancy worked out within the municipality. However, if no solution is made, the alderman will decide on the issue (F. van Leeuwen, personal communication, June 5, 2020).

The project developers also have individual ambitions. "*The ambitions on the one hand and the business case on the other*" (G. Fleuren, personal communication, June 3, 2020). In addition, there are more profits for developers when they perform well. "*Project developers also benefit from buildings that are a calling card for themselves as developers. That can also be in sustainability or social aspects, or liveliness or architectural quality*" (*F. van Leeuwen, personal communication, June 5, 2020*).

The project developers and the municipality of Utrecht have formed an *eigenarencollectief* in which they work together. The decision making in this partnership is various. Sometimes there is a unanimity needed to proceed. In most cases, the majority of the stakeholders depends in terms of volume of ownership. The *eigenarencollectief* in Merwede will be elaborated further in the next paragraph.

PPP opportunities

The partnership in Merwede between public and private parties is also called the joint venture light (Janssen, 2018). The partnership includes the municipality of Utrecht and all the project developers. They work together and have a wide range of ambitions, ranging from sustainability, healthy urban living to inclusiveness (G. Fleuren, personal communication, June 3, 2020). In order to achieve these ambitions, various working groups are organised. These working groups often include a team from the municipality, a team of developers to determine the outline of the plan jointly. This happens in consultation, but sometimes there is a negotiation between public and private parties. The fact that the public parties are more on the interest of the society and the private partners has, next to achieving the ambitions mentioned above, are focused on obtaining a balanced business case (G. Fleuren, personal communication, June 3, 2020).



Concerning the factors that influence the success of a PPP, there are a number of aspects that emerged in Merwedekanaalzone. On the short term, the risks are divided by the agreements in the eigenarencollectief. However, the plan is to initiate a mobility transition in the area. Besides creating High-quality public transport, shared mobility and parking will be implemented. The risks of this transition are substantial and long-lasting. Risks in the long term are hard to distribute between stakeholders. In the development phase, other interests and parties play a role than in the construction or management phase. The issue arises in Merwede when the project developers have realized the housing in the area. (F. van Leeuwen, personal communication, June 5, 2020). The project developers are departed, the partnership stops. However, many risks could arise after construction is completed, both financially and materially. The municipality of Utrecht is now searching for a transfer in responsibility when the developers leave the partnership. "The municipality is searching for a model that does justice to the idea that those developers will be gone at some point" (F. van Leeuwen, personal communication, June 5, 2020). It is currently being investigated whether it is legitimate and profitable to shift the responsibility from the developer to the owner of the building.

Financial construction

The Merwedekanaalzone consists of three subareas to be redeveloped and the related package of spatial measures. Subarea four is financially secured by Municipal land exploitation and a private agreement with the developer. For subarea five the municipality and the market parties involved have agreed in the way in which the development of Merwede can be realised. The agreement includes the programme, the contributions to investment in preparation of building and living, and the contribution to the local area facilities. These agreements form the basis for the financial viability of subarea five

Besides the investments in the public space, there needs to be sufficient infrastructure. However, the development of the infrastructure is too extensive for the municipality of Utrecht. These measures go beyond the scope and financial strength of the Merwedekanaalzone. Due to the size of the measures the municipality is forced to work together with the province of Utrecht and the national government to search for financial coverage. As a result of this, alternative funding methods will be used (Gemeente Utrecht, 2019).

REBEL Group and Goudappel Coffeng published a paper about the funding and financing of the mobility concept in Merwedekanaalzone (Boshouwers, R., Kandel, H., Govers, B. & van der Linde, L., 2018). This research showed that there were multiple possibilities to cover the costs of the mobility transition in Merwede. The private developers, as the developers from the municipality, have a vital role in the financing. An option is that the developers put

approximately 10 euros per m2 into an area fund. This fund is reserved for single-time investments in the mobility concept and temporary start-up costs for service provider and transport providers. The deposits from the developers are parallel with the phase of the development. Due to the phased deposits, there is a need to pre-finance the infrastructure. The pre-financing requires a loan from the national government or province (Boshouwers et al., 2018). Besides the single and temporary costs of the development, there are also structural operational costs for area organisation and service provision. These costs can only be financed from the area fund, but the owner association, investors and housing corporations have to cover these costs on an annual basis (Boshouwers et al., 2018).

4.4 Comparison

In this chapter, the three cases are discussed, and there is an answer provided on subquestions three, four and five. Paragraph 4.4.1 focuses on answering the question of how the conglomerate of stakeholders fits together. Section 4.4.2 explains the motives for parties to engage in PPP. Finally, section 4.4.3 describes the added value of public transport investments in inner-city redevelopment based on the three cases.

4.4.1 Overview of stakeholders

This paragraph answers the question: *Which parties are involved in the development of public transport in inner-city areas in the Netherlands*? Based on the three cases, Haven-Stad, Binckhorst and Merwede, there is made a graphical view (figure 9) of the stakeholders involved on the following page.





Figure 9 Graph of all the parties involved in developing public transport

Figure 9 shows who the involved parties are and whether they act from a public or private goal. Every actor has his role, but they are all connected. The governmental roles include three different layers. The national government is responsible for the spatial policy on the national level. They have an interest in strengthening the economy, under the circumstances that there is no harm to the society or environment. The national government is represented through the Ministry of Infrastructure and Water management. The national government decides on matters that affect the national interest. In terms of accessibility, It is about the highways, railway lines and large metro lines. The national government has no interference in decision making about tram lines or intersections within cities (B. Heinz, personal communication, May 14, 2020). They are also to a lesser extent involved in the development through the Ministry of Internal Affairs. Although the ministry is not directly focused on the development of public transport, they do focus on the housing construction process in the redeveloped area, which indirectly influences the development of public transport.

The province is the spill between the national government and the municipalities. It creates a structure in regional development regarding the spatial policy. However, there is a distinction between Merwede and the other two cases concerning the role of the province. In Merwede, the province of Utrecht gives out the concession to local operators while in Amsterdam and

The Hague the Metropolitan region gives out the concession. The metropolitan region in Province of North and South Holland are besides granting the concession also part of the development of mobility. The focus is on creating a HOV, High-quality Public Transport in the area (H. de Haes, personal communication, June 23, 2020).

The final governmental layer is the municipality, which is the most involved in the development. The municipality aims to lobby for the needs of the local community and pursuit the optimal use of space and sustainable development in the area. They organise the gatherings with all the stakeholders in the area (D. Uitzetter, personal communication, June 9, 2020). The noteworthy point is that the municipality is not entirely on the public side. The reason it is centred between public and private is because in Merwedekanaalzone, the municipality acts as a private developer in the decision-making process.

In all three cases came forward that consultancy firms also play a role in the development's process. An example of this is REBEL group, which is involved in all three cases. They advise the government, often in the field of what to do with the area. Including advising on the structural vision, by looking at what is a feasible housing programme regarding the urbanisation and the market demands (M. van der Does de Bye, personal communication, June 16, 2020). A clear vision of what citizens want is essential. The programme must be set up in response to potential demand in the area. The consultancy collects data for that purpose. In addition, REBEL group researches the combination of urbanisation and accessibility, and how to complete the business case (M. van der Does de Bye, personal communication, June 16, 2020).

For the provision of public transport, there are national and local operators involved. NS is a party that offers a service, public transport, in all kinds of forms. Besides, NS also has a position in area development because it owns the ground around some stations (M. van der Does de Bye, personal communication, June 16, 2020). Until this point, the NS looks like a private party, but the only stakeholder of the company is the national government, which makes them public at the same time.

The regional public transport is divided into smaller local operators. For this purpose, the same applies concerning ownership of the company, which is in governmental hands. The operators determine in which frequency public transport is offered. However, the party that gives the concession (Metropolitan regions or province) only demands a minimum frequency of travel (H. de Haes, personal communication, June 23, 2020). The operator (HTM) in The Hague has besides the operational task, also a contribution to the research into alternative ways of obtaining public transport funding in consultation with the municipality and MRDH (G. Boot,

personal communication, May 19, 2020). This partnership by the name of OV NEXT distinguishes itself from the other two cases where cooperation for funding public transport does not emerge so clearly.

Showed in figure 9, project developers are the only party that is entirely private. The project developers role is to transform the old industry and military locations to full residential areas (D. Uitzetter, personal communication, June 9, 2020). There are several ways of how developers are involved in the inner-city redevelopment. Firstly, the developers have bought up land that is going to be developed. They have acquired a land position and collaborate with the municipality to look at what is possible for development, which ambitions there are and how to organise it. Besides, the project developers are consulting architects and advisers to bring in picture of how the buildings have to look and work, and how (sustainable) ambitions can be realized in the design (G. Fleuren, personal communication, June 3, 2020). In a further stage, they will also carry out the housing construction.

4.4.2 Motives to engage in public-private partnerships

This paragraph answer the question: *What are the motives for public and private organisations to engage in public-private partnerships*? Based on the cases, the development of an area stems from the government, which has a problem in the area and wants to solve it. For example the urbanisation and scarcity on the housing market in the Randstad. However, sometimes the private parties are the ones who see many opportunities and also have a ground position where they want to develop. Thus the initiative may come from the government as well as project developers (D. Uitzetter, personal communication, June 9, 2020).

Thus both public and private parties want to develop the area, 'but a distinction can be made in their goals and motives for operating. The municipality wants to achieve a social goal, for example, through more social housing and high sustainability criteria. In contrast, the project developers have their priorities to make a profit of the development. This separation between the goals of public and private parties is not that straight forward (F. van Leeuwen, personal communication, June 5, 2020). The project developers have a business case that has to be sufficient. On the other hand, they have ambitions for a more sustainable and social development. The municipality does have the same split, but with another focus. The private side of the municipality is also interested in closing the business case. At the same time, and most importantly, the public side of the municipality must be able to justify the development socially. In the end, the development plans are devised on all subjects, including mobility, how they fit within the framework (G. Fleuren, personal communication, June 3, 2020). Besides the individual motives to develop, there are some collaborative motives among the stakeholders. Inner-city redevelopment is extraordinary because of the extreme density, existing buildings and infrastructure. It is so densely packed that every individual development runs into each other. This forces the parties to work together (M. Stemerdink, personal communication, June 5, 2020). "You have to look beyond your own plot boundaries and make a wider plan" (M. Stemerdink, personal communication, June 5, 2020). "You have to look beyond your own plot boundaries and make a wider plan" (M. Stemerdink, personal communication, June 5, 2020). The previous Vinex locations are an example of separate buildings blocks, without an integral plan. As stated in the theoretical framework, the VINEX locations scored poorly on proximity, accessibility of public transport, and mixing functions (Hilbers et al., 1999).

In addition, a partnership could be a win-win situation for public and private parties. The developer can benefit from a financial contribution to an accessibility measure, which can have a positive effect on the value of the houses that are constructed. By this reason, there are next to costs for mobility, also advantages. Moreover, there is a balance between the costs and benefits if the private parties see that they need to be involved in the thinking process and that they will not deteriorate in the end. There is also a possibility it helps to speed up the project (M. van der Does de Bye, personal communication, June 16, 2020).

In the past, the developers used to draw their own plot and not take any surrounding developments into account. This is exemplified in the situation of the development of Leidsche Rijn for a long time. The area is also a Vinex district, with little investment on accessibility. The results were that inhabitants could live there but without decent facilities. So the developer benefits if the surrounding area is taken care of properly, he can contribute a little to mobility developments when he sees that it has a positive effect for him (M. van der Does de Bye, personal communication, June 16, 2020). In the end, everyone just wants to realise the plan, because unoccupied land close to a city does not benefit any stakeholder (M. Stemerdink, personal communication, June 5, 2020).

In the case of Haven-Stad came forward that there is no real PPP construction at the moment. Due to the limited amount of land ownership is the municipality not able to cooperate with private parties. The international cases of Hong Kong and Ørestad already made the importance of landownership visible. If the government owns all the land, they have a means of exchange for the financial capital of the private stakeholders (Studiegroep Alternatieve Bekostiging, 2020). The municipality of Haven-Stad has to find a way to engage private parties to finance the development (Urban Land Institute, 2019).

In the Binckhorst and Merwedekanaalzone, there is a PPP form named Joint Venture (Ultra)Light. Various parties have to get used to this new form of cooperation. Multiple parties in the Binckhorst are missing a clear project manager role in the conglomerate of stakeholders,

which weighs all the interest and takes the plunge. Previously, in area development, there was a project organisation, that stands above the various departments of the municipality and ensures that the decision is taken and implemented (D. Uitzetter, personal communication, June 9, 2020). Now the decision making has to originate from the group of stakeholders. Multiple parties experience this issue. "*The problem is that that whole conglomerate of players lacks a director or a single body that actually makes that decision*" (G. Boot, personal communication, May 19, 2020).

In contrast to the unclear decision making, the transparency and trust among the involved parties are sufficiently present. The reason the trust is well, has to do with the long term joint process (F. van Leeuwen, personal communication, June 5, 2020). Trust can not be violated often, because there will occur many moments that parties have to agree on in the future process. In developing trust, transparency plays an important role. "*Trust can be build to be open about your considerations, that is the essence in the end*" (F. van Leeuwen, personal communication, June 5, 2020). The trust between parties is strong, but the municipality also has a public accountability. Due to the publicity, the municipality is extra thoughtful. They do not want to make a mistake because that would influence their image. This attention is at the national level, the area development sector and the local level. "*There are several articles about Merwede in local newspapers every week. So the municipality has to do very well and ensure that the interests of society are represented as well as possible"* (G. Fleuren, personal communication, June 3, 2020). This makes them more reluctant to give permissions to private developers' engagement.

Now that it is clear what the motives are for working together, the financial possibilities are being discussed.

4.4.3 Capturing the added value of public transport

This paragraph answers the question: *How can the added value of public transport investments be captured in inner-city redevelopment?* In the interviews came forward that developing public transport is not a specific development, but just an element of the whole picture. Besides mobility, there is real estate, ecology, quality of the living environment. Inner-city redevelopment is an integral task for the development entity (M. van der Does de Bye, personal communication, June 16, 2020). In addition, public transport on it its own is also more extensive than the redeveloped area. The development of public transport in the Binckhorst, Haven-Stad and Merwede is part of a more significant interconnected network of infrastructure on a national and international scale.

The integral process makes it challenging to identify the value of public transport. As stated in the theoretical framework, direct value capturing in public transport is already difficult to apply, due to the increase in costs for the users. Indirect value capturing is, therefore, the only option.

An instrument that can be used for alternative financing is the real estate tax (OZB). Each owner of a house annually pays a certain amount of money once the building has been finished. Depending on the cadastral value (WOZ), the amount of tax is determined. This tax revenue goes to the municipality, which they could potentially use for all kinds of things, including public transport (G. Fleuren, personal communication, June 3, 2020). The increased accessibility of the area, through an infrastructure development also has a positive impact on the value of the land register (Studiegroep Alternatieve Bekostiging, 2020). Due to the increased value of real estate tax is well a far-reaching step to undertake (M. van der Does de Bye, personal communication, June 16, 2020). The municipality tries to keep the height of real estate tax approximately the same every year (Studiegroep Alternatieve Bekostiging, 2020).

Another potential instrument is developing a *Gebiedsinvesteringszone* (GIZ). Developers in the Binckhorst have to pay a certain amount of money to contribute to the public space. There are plans to collaboratively contribute to the area (D. Uitzetter, personal communication, June 9, 2020). The GIZ is an instrument to support the financing of area development. In the case of a GIZ, the necessary costs for area development and transformation are paid for by the increase in value: both from existing real estate as through the realisation of new functions. A GIZ is a democratic instrument that allows owners of the property to make agreements on the realisation of collective facilities. A GIZ can be realised through new legislation, instead of partnerships between multiple stakeholders (Studiegroep Alternatieve Bekostiging, 2020).

Besides value capturing, there are multiple alternative financing models which could be useful based on the three inner-city cases. At the moment, alternative funding is in a premature stadium. Much research has been done into which instruments are applicable to help closing the business case. The last couple of years, the REBEL group tried to make visible what the potential of such instruments are and what the criteria are to make it happen. The other instruments which are most seriously considered for implementation in the three cases are mentioned below.

The first one is replacing parking space for housing. The developers get the opportunity to decline the number of parking spaces they have to build according to the parking standard. In Haven-Stad the parking standard is 0.2, while in Merwede and Binckhorst the norm is set at 0.3. This means that one in five households has a parking spot in Haven-Stad. Developers use

the space to build more houses in order to reduce the shortage in dwellings. Due to the shortage of parking spots, the use of cars is less attractive. By this reason, there has to be invested in more sustainable options, like public transport. A condition for implementing this instrument, is the high-quality of public transport (G. Fleuren, personal communication, June 3, 2020). When there is a lack of quality in public transport, people return to using their cars (F. van Leeuwen, personal communication, June 5, 2020). A part of the profit of the developers is saved into a fund, which could be used to improve the accessibility in other ways (B. ter Horst, personal communication, May 19, 2020). Half of the revenue can be for developers, while the other half is in the fund. "Once it is clear that this could be a win-win situation, the conversation should also be more logical" (M. van der Does de Bye, personal communication, June 16, 2020).

There are risks entailed from the decline in parking space and the choice for built parking because of the scarcity of space in the area. Car parking used to be on the streets, but there is chosen to build a car park. The construction costs are high, which gives risks if the parking is used at a low frequency (F. van Leeuwen, personal communication, June 5, 2020). The municipality tries to organise that there are no escape routes for parking somewhere else. For example, on the street, where the parking has to be more expensive or not even possible. Otherwise, the system will not work. At the same time, the surrounding neighbourhoods will have to work with a blue zone parking or a permit system. By this way, parking in other areas will be avoided, and the parking risk is managed (B. ter Horst, personal communication, May 19, 2020).

As described in the Binckhorst case, there is also a possibility to raise the tax for citizens. This *ingezetenheffing* can be used to contribute to the development of public transport. It means that each inhabitant or household pays a certain amount of money which can be collected into a fund to use for the development. However, the issue is that citizens pay an equal amount of extra taxes for a development, but not everyone benefits the same from the developments. New public transport in the Binckhorst is beneficial for the inhabitants closeby, but somewhere in the southwest of The Hague, no one benefits from the development. The usability of the instrument is now under review in the Binckhorst. Experts are now investigating whether it is possible to differentiate the amount of tax based on the benefits.

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5. Conclusions & recommendations

In this chapter, conclusions are presented by answering the research question. Subsequently, the recommendations of this research are presented in paragraph 5.2 and 5.3. Then there is critically reflected on the research in paragraph 5.4.

5.1 Conclusions

The purpose of this research was to analyse and gain insight into how housing can contribute to financing public transport in inner-city areas in the Netherlands, and answer the main question: "To what extent can housing finance public transport investments in inner-city redeveloped areas through public-private partnerships in the Netherlands?

This research has briefly examined the history of financing public transport in the Netherlands. It showed that the Dutch government was entirely responsible for the financing of public transport. Nowadays, however, there has to be looked beyond the financing of the government. New challenges as urbanisation and climate change cause a higher demand for public transport than the government can develop with the available resources. Multiple stakeholders will have to play a role in developing and funding of public transport. Internationally, there are many public-private Partnerships in which the private parties have a leading role in the development. In these cases, the government has a more facilitating role, with more freedom for private parties. In addition, the development of the area also depends on the ownership of the land. Control of land can be seen as a means of exchange for financial capital.

This study explored three cases that planned for developing public transport in inner-city areas. This study shows that the development and funding are complicated due to the limited amount of space and the high number of stakeholders involved. The government is active on multiple levels through the Ministry of Infrastructure and Water Management, the Ministry of Internal Affairs, the Province, the Metropolitan partnership and the local municipality. There are also semi-public and private parties involved in the development, which are the national and local operators, consultancy firms, financial investors and developers. Because of this large conglomerate of players and a small room for error, the municipality is still striving for a strong governmental role. However, there are multiple ways of alternative financing that have potential without governmental financing.

The first one is replacing parking space for housing. The developers get the opportunity to decline the number of parking spaces they have to build according to the parking standard. Developers use the space to build more houses in order to reduce the shortage in dwellings. Due to the shortage of parking spots, the use of cars is less attractive. A part of the profit of

the developers is saved into a fund, which could be used to improve the accessibility in other ways. Half of the revenue can be for developers, while the other half is in the fund.

Secondly, there could be made use of an instrument to raise the real estate tax due to the increased value public transport brings to the properties. At third, there are planned to develop a *Gebiedsinvesteringszone* (GIZ). Developers in the Binckhorst have to pay a certain amount of money to contribute to the public space. At the moment, all the developers only pay for the adjacent environment to the houses they build. However, there is a plan to enlarge the circle and collaboratively contribute to the area. The GIZ is an instrument that allows owners of the property to make agreements on the realisation of collective facilities, which could be used to contribute to the development of local public transport.

Another legislation instrument in which housing could contribute to developing public transport is to use *ingezetenheffing*. At the moment, the *ingezetenheffing* costs the same for everyone, which is not justified because not everyone in a city benefits equally from a local public transport development. There are studies into the possibilities to differentiate the amount of tax based on the benefits.

The instruments mentioned above show that developers can play a role in the financing of public transport, but it is not that straightforward. Inner-city redevelopment is an integral task. Besides public transport, there is real estate, ecology and quality of the living environment that has to be taken into account. If developers have to contribute to everything separately, it becomes impossible to create a sufficient business case. The total package of development ambitions, including public transport, has to be lucrative for developers to continue building.

Regarding the PPP in inner-city areas, there can be stated that it is challenging to constitute a partnership for public transport when the conditions are not favourable. In particular, land ownership can be decisive in setting up a PPP. However, there are possibilities of PPP in mild forms in the Netherlands. There are now experiments with the Joint Venture Light and Ultralight, which makes public and private stakeholders jointly responsible for the development of the central structure and public space. However, the developers stay responsible for their plot.

Co-financing of public transport will become more and more important in the future. There is already more understanding to jointly search for a solution to finance public transport, because it can create a win-win situation for both public and private actors. These partnerships will be significantly different than international PPPs, because of the directing role of the Dutch government. However, there are plenty of opportunities for collaborations and new financing instruments within the governmental framework.



5.2 Recommendations for policy and practice

In this paragraph, recommendations for policy and practice are made which correspond to the study.

Creating recognition of alternative ways of financing

Alternative financing is in a premature stadium. Much research has been done into which instruments are applicable to help closing the business case. The stakeholders involved in the development of an area are often not aware of the benefits of these methods of financing. Researching the potential of these instruments can increase understanding of the instruments and make them suitable for long-term use.

Increasing experimenting in alternative methods of financing

As a follow-up to the study of the instruments, there could also be more experimental areas. Binckhorst, Haven-Stad, and Merwedekanaalzone are one of the first inner-city redeveloped areas in the Netherlands from this scale, which makes them lay under the microscope. This makes it challenging to test instruments because it increases the chances of errors. However, some instruments can be implemented with only minor adjustments. For example, the *gebiedsinvesteringzone* and *onroerende zaakbelasting* are instruments which could be realised by a change in legislation.

Clearness of roles involved stakeholders

For the stakeholders, it is essential to know who fulfils which role. When it is more clear where everyone stands with each other and what goal they are pursuing, it will also be easier to create a successful PPP. In addition, the research showed that it is not always clear who is taking the lead in the development of the area. A project leader could be appointed, which is responsible for the project overview. This project leader needs to be supported with the right experts and mandates within a clear framework to operate properly.

5.3 Recommendations for further research

This paragraph includes recommendations for further studies and the development of theory.

There should be taken in mind above all else that the study of financing public transport is in full development in the Netherlands. Alternative ways of financing public transport are needed in the future, which makes them interesting to look in more detail. In this study, there are a couple explained, but there are instruments that potentially contribute to financing public transport. It might be interesting to explore these instruments in more depth. In particular, when the experimenting phase of these instruments starts.

In addition, it could be interesting to study further into the opinion and role of the citizens in financing public transport. After all, they are the ones who are going to live in the area and make use of public transport. At the moment, the inhabitants are not directly included in this research, because the phase in which the three developments stand is more at an expert level. The research into the role of the inhabitants could be carried out in a later phase of the development when the instruments are already established.

Another relevant follow-up study should be conducted that aims to research the potential contribution of Dutch national railway service (NS) to area development and the financing of public transport. The NS also has a position in area development because of their landownership adjacent to the stations. In addition, it could be more interesting because of the concession for operating national public transport for NS is extended. By this reason is the NS is active in the long term, which makes a partnership with other stakeholders more likely to succeed.

5.4 Reflection

This paragraph is dedicated to reflect on the steps and choices made throughout this research. The limitations and points for improvement are also depicted.

The generalization of the results is limited by the fact that there are three cases explored which are different in partnerships and way of financing. However, the stakeholders involved and instruments that are going to be used have corresponded in the cases. Since there are few sizeable inner-city redevelopments in the Netherlands, it can say something about the situation.

By doing the literature study and drawing the theoretical framework, the focus was on value capturing as the most substantive way of alternative financing. However, in practice, it turned out that many other methods were being considered for implementation. Regarding the conceptual framework, there could be stated that developing public transport brings not only value capturing, but multiple opportunities to financial partnerships to gather a sufficient amount of financial capital.

In the process of the research, I discovered that the focus on financing in inner-city areas was more on experimenting with different financing instruments to contribute to public transport, than focusing on the engagement in a PPP to finance the development. This also revealed an essential difference between financing and funding. While I started the research, financing was the operative term. However, there is a critical distinction between financing and funding. Financing is the temporary provision of financial funds at an interest rate to be paid after time. While funding is the inclusion of the cost of the investment from a party. In the case of public funding, the costs shall be borne by the public sector, in the case of private funding, companies and users shall bear the costs.

The data collection was not entirely proportionally distributed by case, because in the Binckhorst and Merwede developments have already progressed, which leads to a higher variety of stakeholders involved. The private side in Haven-Stad is, therefore, not part of the respondents who participated in the interviews.

In the literature, I focused on public transport in inner-city areas, but it turned out to be more extensive in two different dimensions. Public transport should be seen as a whole in the Netherlands, even on an international level, there is a network. Due to this interconnectivity, it is challenging to point the beneficiaries and stakeholders that have to bear the costs. Besides, public transport does not stand alone. At the city level, the redevelopment must also include all other aspects of development.

As far as the main question is concerned, the phase of development of the three areas has not advanced far enough to fully discover the extent to which housing can contribute to public transport. If anything about the finances was already known, the interviewees were not able to make it public. The contribution of housing to public transport is notable, but at the moment it is still unclear which financial instruments can and may be applied.

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7. Appendices Appendix A

This interview guide was used as a default. It was adjusted to the person who was interviewed.

Interview guide Master thesis Co-financing public transport Menno van Dinther

In dit onderzoek wil ik te weten komen in hoeverre woningbouw financieel bij kan dragen aan investeringen in het openbaar vervoer via publiek private samenwerkingen? Dit doe ik via een kwalitatief onderzoek waarbij ik vanuit verschillende stakeholders perspectieven. Hierbij heb ik gekozen om 3 verschillende casussen te onderzoeken. Havenstad en dan Merwede in Utrecht en Binckhorst in Den Haag.

- Rapportage (opname, anonimiteit, feedback)
- De structuur van het interview is als volgt (eerst de introductie, samenwerking tussen partners, de kosten en baten, impact op de maatschappij, kennis/vaardigheden, de risico verdeling). Het zal ongeveer 30/45 min duren.

Introductie

- Hoe omschrijft u de rol van u/uw organisatie met betrekking tot de binnenstedelijke herstructureringsontwikkelingen?
- Hoe bent u/uw organisatie betrokken geraakt bij deze ontwikkelingen?
- Bent u bekend met de ontwikkeling van merwede, binckhorst en havenstad?

Samenwerking tussen partners

- Wie neemt de leiding in de ontwikkeling van het gebied (zowel woningbouw als openbaar vervoer)?
- Hoe worden besluiten genomen?
 - Wat vindt u van deze vorm van besluitvorming?
- Wie neemt de leiderschapsrol op zich in dit project?
- Wat zijn de motieven voor publieke en private organisaties om publiek-private partnerschappen aan te gaan?
- Welke rollen zijn er nodig voor een succesvol ontwikkeling van het openbaar vervoer in de regio?
 - Waarom zijn deze rollen nodig?

Kosten & baten

- Hoe denkt u dat de kosten van het openbaar vervoer het beste verdeeld kunnen worden onder de betrokken partijen in de ontwikkeling)?
- Welke partijen zijn gebaat bij een investering in het openbaar vervoer in het gebied?
 - Wat is de verhouding tussen de baten en kosten per partij betreft de financiering van het openbaar vervoer?
 - Bent u tevreden met de bestaande verhouding?
- In hoeverre kan nederland nog een voorbeeld nemen aan een bepaald land betreft alternatieve bekostiging?
 - Welke aspecten zouden daarvan in Nederland geimplementeerd kunnen worden?
- In welke vorm van alternatieve bekostiging heeft u het meeste vertrouwen in de toekomst?



- Nu de concessie van de NS is verlengd, welke rol kunnen zij spelen in de ontwikkeling van openbaar vervoer in Nederland?

Impact op natuur/maatschappij

- Welk effect hebben de ontwikkelingen op het ecosysteem in het gebied?
 - Hoe is dat te zien?
- Wat zijn de reacties vanuit de gemeenschap?
 - Indien er negatieve reacties zijn, hoe wordt daar mee omgegaan?
- Hoe wordt het project naar buitenwereld gecommuniceerd?
 - Kan dit nog verbeterd worden?

Kennis/vaardigheden

- In hoeverre is alle kennis aanwezig om de succesvol een binnenstedelijk gebied te ontwikkelen?
 - Ontbreken er nog stakeholders?
- Welke financiële middelen zijn er om de benodigde vaardigheden en kennis te bemachtigen?
- Hoe weerhoudt dit project zich met andere binnenstedelijke herontwikkelingsprojecten in Nederland? (is er veel gebruik gemaakt van bestaande kennis of zijn er nieuwe technieken toegepast?)
 - Wat zijn de overeenkomsten/verschillen?

Risico verdeling

- Wat zijn de mogelijke risico's in de ontwikkeling van openbaar vervoer in binnenstedelijke gebieden?
 - Hoe kunnen deze risico's worden verdeeld of verkleind?
 - Waarop worden de risico's verdeeld (Mogelijke winst, onkosten, hoeveelheid investering)?
- Wat zijn mogelijke tegenslagen gedurende het proces?
 - Hoe wordt hiermee omgegaan?

Afsluiting

- Heeft u nog iets toe te voegen?
- Kan ik contact met u opnemen indien ik vragen heb tijdens het verwerken van het
- interview?
- Bedankt voor uw tijd.

Appendix B

Codebook Atlas.ti

Figure 10 showed how the codes are merged into families and how often they are used. Besides the codes that were used from the indicators for PPP (figure 3), there are also codes given by area to use for the comparison.



Figure 10 Capture of code families in Atlas.ti