



UNIVERSITY OF AMSTERDAM

REDEVELOPMENT PLAN FOR THE ZAAANSTRAAT MARSHALLING YARD



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Table of Content

| | |
|-------------------------------------|-----------|
| 1. Introduction | 2 |
| 2. Theoretical Framework | 3 |
| 2.1. Garden Cities | 3 |
| 2.2. Marshalling Yard Redevelopment | 6 |
| 3. Methodology | 8 |
| 3.1. Data Gathering | 8 |
| 3.2. Planning Interventions | 9 |
| 4. Context | 10 |
| 4.1. Havenstad project | 10 |
| 4.2. Spaarndammerbuurt | 12 |
| 4.3. Westerpark | 13 |
| 4.4. Marshalling Yard | 14 |
| 4.5. Stakeholders | 15 |
| 5. Interventions | 17 |
| 5.1. Community | 17 |
| 5.2. Climate Proofing | 18 |
| 5.3. Connectivity | 19 |
| 5.4. Character | 20 |
| 5.5. Collaboration | 21 |
| 6. Discussion | 22 |
| 6.1. Reflections on the report | 22 |
| 6.2. Reflections on the group work | 24 |
| 7. Conclusion | 24 |
| 8. Sources | 25 |
| 8.1. Scientific and grey literature | 25 |
| 8.2. Interviews | 28 |

1. Introduction

The city of Amsterdam is experiencing a severe housing crisis with half of all housing seekers in the Netherlands wanting to live there (Kruyswijk, 2022). The city is currently lacking over 175,000 homes and figures show a shortage of 10,000 to 15,000 homes for vulnerable groups by 2030, which is the highest ever recorded (Hielkema, 2022). In addition, Amsterdam's population is growing by 11,000 each year with a projected 1 million residents by 2040 (Kruyswijk, 2022). Part of the municipality's strategy of dealing with the severe housing shortage is the creation of the Havenstad in the northwest of Amsterdam. The municipality has designated this area as a redevelopment zone to increase the supply of housing through the creation of a highly urban mixed-use development (Borren, 2017). In June 2017, the city council presented plans for a part of the Western Port Area and Amsterdam North located within the A10 ring road.

While some plans for Havenstad's residential development are well known, there is still a lack of specific details about the appearance of some of its sub-areas. One of those is the Zaanstraat Emplacement located between the Spaarndammerbuurt and Westerpark. Additionally, with the increasing focus on the issue of climate change, it is imperative that the development of new residential neighbourhoods is designed in a manner that prioritises both livability and sustainability. This concept of neighbourhood design can be traced back to the early 20th century, with the advent of the Garden City movement. The idea of Garden Cities, as put forth by Ebenezer Howard in 1898, envisioned a balance of residential, industrial, and agricultural areas within a single urban development. The concept aimed to provide the best aspects of rural and urban living while avoiding their respective drawbacks (Howard, 1965). The Garden Cities concept, despite being over a century old, continues to be relevant for contemporary urban development, potentially with some modifications. Accordingly, it serves as the starting point for this report, functioning as a guiding principle for new urban developments.

This project aims to design a new urban area for the Zaanstraat Emplacement (figure 1) while incorporating relevant principles from the Garden City concept. The research question, derived from the purpose of the study, reads: *How can the development of the Marshalling yard integrate into the existing surrounding neighbourhoods by following modern Garden City Principles?*

This report is structured into six main chapters. Chapter 2 lays out the theoretical framework of Garden Cities by presenting the original ideas of Howard, reviewing real-world Garden City examples and the development of the concept over time. Literature on other redevelopment projects of marshalling yards are summarised. Chapter 3 of this report focuses on methodology and outlines the steps taken to address the research question. The methodology section provides justification for the specific methods selected. Chapter 4 provides the context of the case study, including a description of the current state of the

project, the surrounding areas, and the Marshall Yard. Additionally, the main stakeholders who have interest in and influence on the development of the marshalling yard area are discussed. Chapter 5 outlines the five concrete interventions proposed to redevelop the marshalling yard in accordance with the Garden City principles. Chapter 6 reflects on the realism of the redevelopment project and concludes with a discussion. A final conclusion is drawn in the last chapter.



Figure 1: Zaanstraat Emplacement (Gemeente Amsterdam, n.d. a)

2. Theoretical Framework

The report is based on the theoretical literature on the concept of Garden Cities and other redevelopment projects of marshalling yards.

2.1. Garden Cities

The Garden City approach was originally developed by Howard, responding to the challenges created by unplanned urban sprawl and rapid urbanisation following from the rise of capitalism and the industrial revolution in the 19th century in Europe (Domhardt, 2012; Gatarić et al., 2019). Recognizing the advantages and disadvantages of the urban town and the surrounding rural countryside, Howard aimed to combine the benefits of both to create his vision of garden cities: Livable, low-density areas with low housing costs that are integrated into nature and, at the same time, offer job opportunities with high wages, public space for cultural activities and a cooperative society (Howard, 1965). More concretely, Howard's vision entailed the creation of new garden cities, arranged in a circle around an existing urban centre of high density (Figure 2). As envisioned by Howard, each Garden City would be limited in geographical size and population density and connected to the central city and each other through high-speed railway connections. They would be economically independent, providing their residents with local industry, agriculture and public green space. In their ideal version, Garden Cities would be social cities with a socially mixed

population organised through active community management and collaborative ownership structures (Sharifi, 2016). The overall optimistic outlook and approach to solving urban challenges were rooted in Howard’s firm belief that “technological advance could emancipate men from degrading toil, and that men are inherently co-operative and equalitarian” (Preface by F. J. Osborn in Howard, 1965, p. 20).

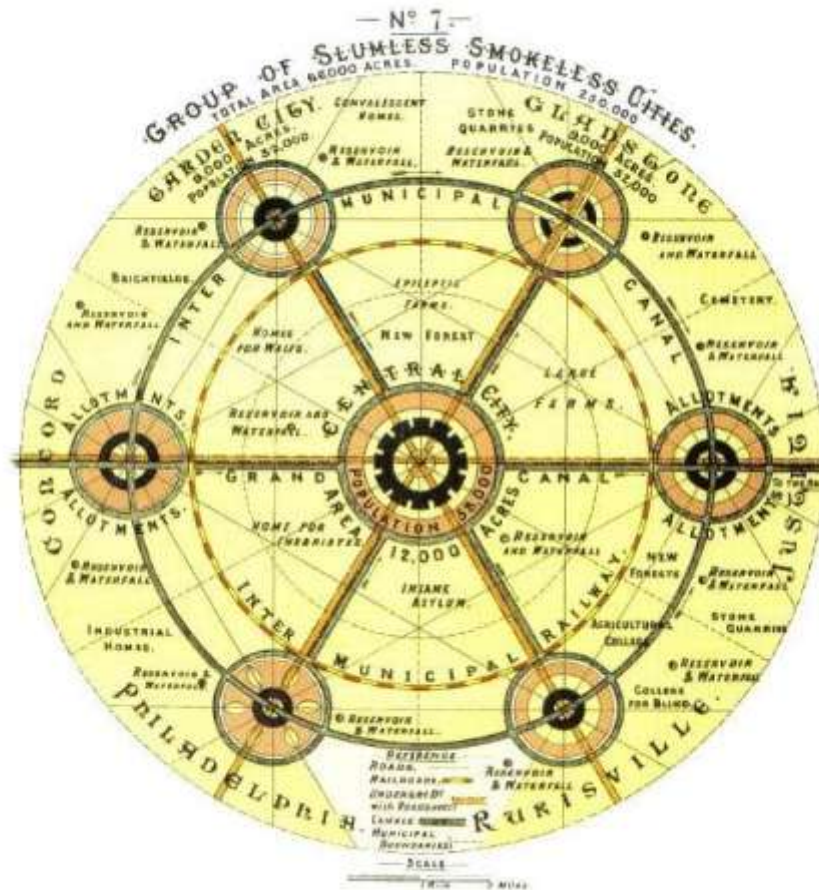


Figure 2: Garden City Diagram (Howard 1902, as adapted by Fahmy, 2010).

Despite Howard’s noble intentions set out in his theoretical framework on Garden Cities, there has been critique around real-world examples of so-called Garden Cities or Garden City inspired settlements (Vernet & Coste, 2017; Falk, 2017; Gatarić et al., 2019). Today, the Garden City concept is often associated with spacious, socially homogeneous and car-dependent suburbs instead of communal and self-sufficient neighbourhoods (Falk, 2017). Some scholars blame that on the fact that, in the UK, suburbs and Garden Cities have a similar point of origin, both being rooted in considerations of social tensions and a lack of hygiene in dense urban centres (Vernet & Coste, 2017). Therefore, they see an effect of cross pollination between the two ideas which both aim to combat urban growth and overpopulated urban centres by establishing close-by settlements. Several scholars from the UK see fundamental flaws in the feasibility of the theoretical framework set out by Howard. Hügel (2017) claims that the financial model of Garden Cities which was rooted in communal

land ownership and reinvestment of financial surplus in the community was not able to gather the financial support of private investors it would have needed to succeed. Furthermore, the author compares it to other city concepts that have attained mere buzzword status over the years, claiming that they share a weak normative basis which isn't robust to planners picking out singular aspects of the concept, thereby using the concept's name as a promotional tool without respecting its core intention. In a similar vein, Hardy (2005) claims that today socialist ideals such as sharing wealth, that are reflected in the core principle of communal land ownership, would be "too radical for mainstream development" (p. 388). It must be acknowledged that successful examples of communal land ownership exist, such as in the form of community land trusts (Moore & McKee, 2012). However, they seem to not be utilised for the implementation of garden cities.

Case studies following the implementation of Garden City projects overall affirm the difficulty of implementing Howard's ideals, particularly that of communal ownership. The first city designed under Howard's Garden City principle was Letchworth, UK in 1903 (Bonham-Carter, 1951). Letchworth is one of few real-world examples of successful implementation of a Garden City based on communal ownership rights. However, various public reforms in England have posed significant challenges to the city to maintain its original collaborative ownership and financial reinvestment scheme and some significant compromises had to be made, leading to some individually owned property (Miller, 1978). Several iterations of public management and collaborative ownership structures were necessary to preserve most of the Garden City ideals over the years and the final operational model chosen by Letchworth has not been replicated in other cities (Lewis, 2015). Besides the communal property rights, which in many Garden City projects were not even attempted in the first place, dominant critiques of Garden Cities are their lack of economic self-sufficiency (Sharifi, 2016), which is connected to the observation that industry did not settle in newly created Garden Cities as expected (Vernet & Coste, 2017). Since the communal core of Garden Cities was often overlooked, favouring architectural planning goals over social goals, existing Garden City neighbourhoods often fail to cater to low-income residents (Sharifi, 2016).

Despite difficulties implementing some of the concrete Garden City ideas, the concept and principles of the Garden City established by Howard were highly influential and are still reflected in many of the neighbourhood planning approaches of today. Howard has been considered the founder of sustainable neighbourhood initiatives (Sharifi, 2016) and a pioneer of modern urban planning (Gatarić et al., 2019). "[His] visionary principles of efficient, self-reliant, and equitable communities are still among the major challenges in the way of achieving neighbourhood sustainability" (Sharifi, 2016, p. 12). Thus, they are useful as a guideline for the redevelopment plan of the marshalling yard.

Until today, the principles can be identified in other internationally influential neighbourhood development movements, such as eco-urbanism, the modernism movement

and new urbanism (Sharifi, 2016; Vernet & Coste, 2017). Similar to the Garden City approach at its time, the new planning movements react to upcoming challenges in urban neighbourhoods. Consequently, the core principles of the Garden City movement have been expanded over the years to include, for example, environmental sustainability in the creation of new infrastructure or the retrofitting of existing infrastructure or walkability and bikeability to foster public health. Furthermore, there is a trend towards tolerating higher levels of density in modern planning movements due to the increasing severity of land scarcity in urban areas (Sharifi, 2016). Scholars and practitioners who still stick to the label of Garden City have taken up the new principles, attempting to integrate them into the original vision of Howard. For example, Falk (2017) proposes the five Cs of the Cambridgeshire Quality Charter for Growth (Urban and Economic Development [URBED], 2008) as guiding principles to set up new Garden City agendas in the 21st century:

1. Community
2. Climate proofing
3. Connectivity
4. Character
5. Collaboration

These five modern day Garden City principles will be used as guiding principles for the proposed redevelopment of the marshalling yard area in this report. Doing so shall prevent the new neighbourhood from falling into the same pitfall of overlooking basic components of Howard's Garden City vision while also responding to pressing needs of modern cities. Doing so ensures that the final product goes beyond a mere focus on the physical design of spacious green neighbourhoods with homogenous and socially isolated communities. Instead, a climate proof neighbourhood with an engaged community shall be created in a collaborative process, ensuring that the area is connected to the rest of the city and retains some of the essential character of the existing surrounding neighbourhoods (URBED, 2008).

2.2. Marshalling Yard Redevelopment

"Urban redevelopment is the process of revitalising or transforming underutilised, obsolescent, or distressed urban land and buildings, often with the goal of promoting economic development, improving housing, and enhancing the quality of life for residents" (Rohe et al., 2008). More specifically, one area of urban redevelopment that has received significant attention in recent years is the redevelopment of marshalling yards. Marshalling yards, also known as railway yards, are large areas used for sorting and storing rail cars. They are typically located on the outskirts of urban areas and can take up a significant amount of land. The redevelopment of these areas, therefore, has been seen as an opportunity to create new mixed-use developments that combine residential, commercial, and recreational uses, in order to create more vibrant and livable urban districts, while also addressing issues

of land use and transportation. This is why the regeneration of marshalling yards has been a topic of interest in many cities across Europe such as London, Rotterdam, Paris and Milan.

One of the earliest examples of marshalling yard redevelopment in Europe is the **King's Cross Central** development in London, United Kingdom (Figure 3). The large site, which was previously used as a railway goods yard, was developed into a mixed-use area featuring offices, homes, shops, and public spaces (Couch, 2014). The project, which began in the 2000s and was completed in 2016, is notable for its incorporation of the historic railway buildings and the existing infrastructure into the new development in one of the most central areas of London.



Figure 3: King's Cross Redevelopment London (Kings Cross, n.d.).

In France, the redevelopment of the **Gare des Mines** in Paris is another example of a marshalling yard conversion project. The former railway yard, which was located in the 18th arrondissement, is now being transformed into a mixed-use development featuring housing, offices, and public spaces. The project is relevant for its ambitious incorporation of sustainable design elements such as green roofs and rainwater harvesting systems (P&MA, 2022).

Despite not being a marshalling yard, the redevelopment of the **Hofplein** railway viaduct in Rotterdam is relevant as it has been a major focus of the city's urban redevelopment efforts. The project has transformed the site into a new mixed-use neighbourhood, including housing, offices, and public spaces. Finally, the Hofplein station's roof was renovated in 2015 to become a gathering place for all residents of Rotterdam, for them to relax, enjoy the view and meet friends (Polderman et al., 2022).

Lastly, in Milan, Italy, the redevelopment of the Porta Romana marshalling yard is probably the most similar case to Zaanstrat railway yard. The project is still at the early stage and aims to create a new mixed-use neighbourhood, including housing, offices, and public green spaces. The project is supposed to be finished by 2026 since part of the housing in the site

will be used for athletes at the Winter Olympics in that year (Scalo di Porta Romana, 2022). Moreover, the plan includes the conservation of the building once used for the maintenance of railway trains, the former Rialzo Squad, as it is considered particularly representative from an architectural point of view (Figure 4).

Overall, these examples from major European cities demonstrate that marshalling yards, given their size, are incredibly interesting spaces where mixed-functionality is typically pursued because it is a crucial component of an area's liveability, attractiveness, and security in a place where transit mobility was originally the primary focus (Bertolini, 1998).



Figure 4: Scalo Porta Romana Milan. Two left pictures: before redevelopment. Right picture: after development (Scalo di Porta Romana, n.d.).

3. Methodology

The methodology section of this research project outlines the steps taken to answer the research question given by the client and to explore possible solutions for the redevelopment of the Zaanstraat marshalling yard.

3.1. Data Gathering

The group met with the client, Het Schip Museum, at the start of the project. During this meeting, an overview of the request and of the Garden City Movement was provided by the client. This information was used to guide the team's research efforts and to ensure that the project aligned with the client's goals and expectations.

Next, the entire team conducted a site visit to explore Spaarndammerbuurt, where the Museum is located, the marshalling yard, and the surrounding areas. This visit was a crucial step in understanding the current state of the marshalling yard and the context in which the redevelopment would take place. The team took notes and photographs during the visit, which were used as reference material throughout the research project.

Additional data was collected by conducting semi-structured interviews with two residents living in Zaanstraat, the road adjoining the marshalling yard. The sample of respondents was provided by the client, and the two interviews were conducted in person respectively in Dutch and in English. These interviews provided valuable insights into the perspectives of local residents, which helped the team understand the needs and concerns of the community. Furthermore, more information was gathered from interviews conducted by the other two groups working with the same client. They interviewed a total of six residents of Spaarndammerbuurt living close to the marshalling yard. Due to a similar research focus on garden cities and neighbourhood development, their interview results were relevant for this project.

A scientific literature review on the Garden City Movement was conducted starting from the overview given by the client. From there, the research moved on to more recent literature on the evolution of the Garden City approach and its current issues. This led the team to focus on Falk's (2017) suggestion of the 5 Cs (community, climate proofing, connectivity, character, and collaboration) (URBED, 2008) as guiding principles of modern Garden Cities. This framework helped the team understand how the redevelopment of the marshalling yard could be aligned with modern Garden City principles, creating a livable and sustainable neighbourhood that is integrated into the surrounding areas and adds to the lives of local residents. Therefore, the redevelopment plan that follows in the report is organised following these 5 Cs, which were used both as selection and assessment criteria for the ideas of intervention.

Alongside the scientific literature review, the team also relied on a wide range of grey literature. To understand the context of the Havenstad plan and the state of the marshalling yard, local news articles online, municipality documents, urban plans, and other reports available online were used. This information helped gaining a more comprehensive understanding of the marshalling yard and the surrounding area, and to identify any relevant policies or plans that would need to be taken into account when presenting our project idea.

3.2. Planning Interventions

An initial brainstorming activity was conducted to define a reflection question that includes the intended action, the final user, and the desired effect: "How might we create guidelines for the redevelopment of the Zaanstraat marshalling yard, according to modern Garden City principles for its current and future residents, in order to increase social cohesion and the community spirit of the neighbourhood?" This question served as the foundation for the research project and guided the team's efforts throughout the data collection and analysis process.

Following the initial brainstorming activity, a more in-depth stakeholder map was created to help the team identify key individuals and groups that would be affected by the redevelopment of the marshalling yard. Then, a first brainwriting session was conducted to

generate ideas that were rated based on two main characteristics of the original Garden City principles: environmental sustainability and community spirit. However, since these are relatively generic factors, an ultimate selection of the ideas was made by rating, then choosing and categorising them following the 5 Cs (URBED, 2008), in a way that fits more closely with the modern Garden City framework illustrated by Falk (2017). Interventions were picked that holistically contribute to several of the principles according to scientific literature. It was ensured that each principle was covered by at least one intervention.

Overall, the methodology employed in this research project includes a combination of brainstorming and idea generation, meetings with the client and site visits, semi-structured interviews, scientific literature review, and grey literature review to gather data and explore possible solutions for the redevelopment of the Zaanstraat marshalling yard.

4. Context

When redeveloping the Zaanstraat Emplacement, it's crucial to understand its conceptualization in the existing Havenstad development ideas, its impact on the surrounding community, and how it affects the nearby neighbourhood. Thus, the larger context of the Havenstad project, the two closest surrounding neighbourhoods and the existing use and plans for the marshalling yard are presented. Relevant stakeholders for the marshalling yard are presented and their influence and interest in the area summarised.

4.1. Havenstad project

In light of the current housing shortage that the city is facing and its increasing population density, the Municipality of Amsterdam has decided to create a new urban development – Haven-Stad, also known as the Port City (Gemeente Amsterdam, n.d. c).



Figure 5: Haven-Stad Area of Intervention (Gemeente Amsterdam, 2017)

The plan consists of redeveloping 12 sub-areas in the western part of Amsterdam (Figure 5) and turning it into sustainable and affordable residential and working districts. Accordingly, it will have up to 70,000 homes and 58,000 jobs to cater the needs of a changing city (Gemeente Amsterdam, 2017).

The aim is to create an area focused on pedestrians, where everything is accessible and nearby, from shops, to schools, to public green spaces. This prioritises walking, biking and the use of public transport. Port-City will, therefore, be a car restricted area, with only few parking spaces. As stated by the Municipality, only 1 in 5 households will have parking. Naturally, the public transport system will also suffer major changes, with the possibility of a cable car, plans to expand and close the metro ring line by creating a station at Sloterdijk, as well as creating more bus and tram stops from Marnixstraat to Spaarndammerstraat (Gemeente Amsterdam, 2022).

A few frameworks were created to conduct a smooth renewal of the area and create a balanced mix of urban functions, such as the Port City Integral Framework (Gemeente Amsterdam, n.d. c) and the Basic Framework Map (Gemeente Amsterdam, n.d. d). The first one is the basis for management of reservations in public space. It is composed of smaller urban planning frameworks that make sure there is cohesion between urban quality, facilities, greenery, sports, water, ecology, mobility and sustainability (Gemeente Amsterdam, n.d. c). One of them includes the Green Standard, a formula that calculates the amount of greenery that should exist per household, which is 22m² (16 m² of green space for use and 6 m² of ecological green space). The Basic Framework Map shows how central areas, roads, public transport connections, streets and squares, parks and sports grounds can be integrated and developed in a coherent manner (Gemeente Amsterdam, n.d. d). It also attributes different values to each space, either due to accessibility, suitability for a specific function or historical/cultural value.

It is important to highlight that the Port City is quite an ambitious and extensive urban plan, which requires a lot of time and investment. Because of this, construction had to be phased, meaning it will take a greater time. Outlines for the development started around 2009, the Port City Development Strategy was only published in 2017 and the transformation itself can take up to 2055, with the conclusion date being uncertain. Currently, Sloterdijk Center is the only area which has undergone transformation and was finished at the beginning of 2018, with more than 600 new homes, some of which are temporary and others are social housing. The Municipality of Amsterdam has stated that the urban changes have had a visible and positive effect on the neighbourhood and the community. Other areas that have started construction include Minerhaven.

Taking a look at the stakeholders involved in the Haven-Stad project they are a mix of public and private. The main investors are the Municipality of Amsterdam and the Port-City Program Organization (*Schetsen aan Haven-Stad*). Other stakeholders that were mentioned

in the project's website but weren't specified include entrepreneurs, interested parties, experts and residents. In terms of the collaboration and participation process between the developers and the community, there seems to be some dialogue through the 'Schetchen aan' sessions where current and future residents are informed of the transformation stages, as well as obstacles that are being faced.

4.2. Spaarndammerbuurt



Figure 6: Spaarndammerbuurt (Rijksdienst voor het Cultureel Erfgoed, 2009).

The Spaarndammerbuurt is a neighbourhood located in Amsterdam's Western district. To the south, the neighbourhood borders the former Hembrug to the Zaandam railway line, now the site of Dutch Railways' line workshop.

The Spaarndammerbuurt is undergoing a significant change, partly because of the new high-priced developments in the neighbouring Houthavens area. Gentrification has resulted in the Spaarndammerstraat now featuring numerous new shops, cafes, and outdoor setting areas (Cozijnsen, 2018). Previously, the area was affected by poverty and numerous neglected houses that were in serious disrepair. However, many of the houses have since undergone redevelopment. Although the neighbourhood is described by its residents as a working-class neighbourhood, this character seems to be changing rapidly (Couzy, 2017).

4.3. Westerpark



Figure 7: Westerpark (Gemeente Amsterdam, 2019)

The Westerpark is located south of the Zaanstraat Emplacement, consisting of a green park and the historic Westergasfabriek buildings. It's at the edge of the city centre and offers activities like running and tennis. However, with the growth of the surrounding areas and new development like Haven-Stad, the park is becoming overcrowded and lacking green space (Het Schip Project Group 2, Interview 1). It is crucial for the development of the Zaanstraat Emplacement to consider its impact on the Westerpark and address the issue of overcrowding in the park.

4.4. Marshalling Yard

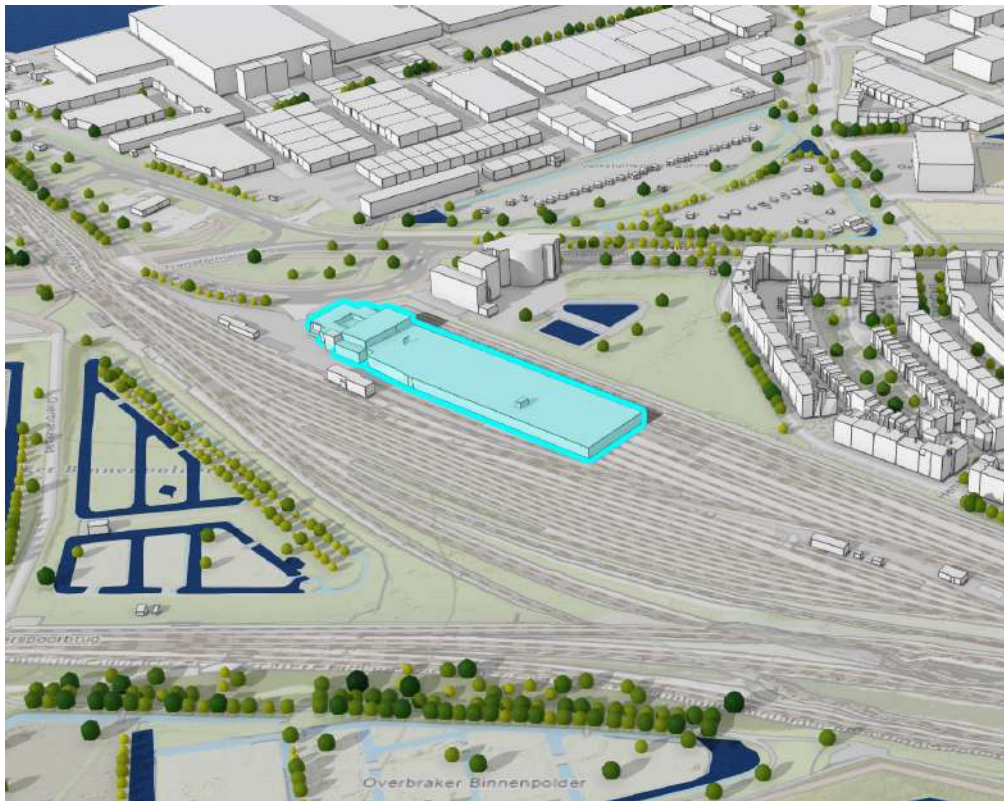


Figure 8: Zaanstraat Marshalling Yard. Warehouse highlighted. (ArcGIS - Digital Twin Startomgeving - Amsterdam)

The marshalling yard is located between Westerpark and Spaarndammerbuurt and is part of the area of the Havenstadt project. Currently, it is still in use, housing the railways of the marshalling yard and a large warehouse for train maintenance (Figure 7). The municipality plans to start redeveloping the yard after 2025. However, little information is available on what is planned for this particular section of the Havenstad project. According to the municipality, 182,000 m² of building area shall be created on the current marshalling yard, entailing 1,820 new homes, 1,213 jobs, one school, one care center and 9,100 m² for organized sports (Gemeente Amsterdam, n.d. b).

The only development plan that holds some concrete information for the marshalling yard is the mobility plan for Havenstad South and Sloterdijk II (Gemeente Amsterdam, 2021). Accordingly, a new cycling path is planned from one end of the Marshalling yard to the other lengthwise. Furthermore, a district mobility hub is planned after 2028 that shall cater to 2000-3000 apartments, offer cars, bicycles and scooters with the aim of concentrating the car mobility, thereby making car use available to everyone, but remotely. A new metro station connecting Sloterdijk and Centraal shall be built which most likely would be located at the north-western end of the marshalling yard. No concrete timeframe for the closing of the metro ring is provided. North-east of the marshalling yard, outside of the Havenstad development project, a concrete development plan exists.

The existing triangular area of green space in between the Zaanstraat, the marshalling yard and the public swimming pool (Figure 7) used to house sport facilities until 2004 (Gemeente Amsterdam, 2009). For an intermediate period, a community garden project of the local residents was located here (Het Schip Group Project 2, Interview 1). Starting in 2023, the area shall be redeveloped as part of the Bredius project to house a new sports facility, space for new housing and two restaurants or cafés (Gemeente Amsterdam, 2009).

4.5. Stakeholders

After carefully analysing the Zaanstraat Emplacement, we concluded there were very few stakeholders involved. To conduct a better stakeholder analysis, the scope was stretched to the surrounding areas, where various stakeholders were found. However, not all of them had a relevant role in the Zaanstraat Emplacement, hence in our analysis we have only included the ones that are directly linked to our area of intervention. They are the following: Government of The Netherlands; Municipality of Amsterdam; ProRail; NS; GVB; Het Schip Museum and Residents. They were ranked according to their interest in the redevelopment project of the marshalling yard and their ability to influence concrete decisions (Figure 9).

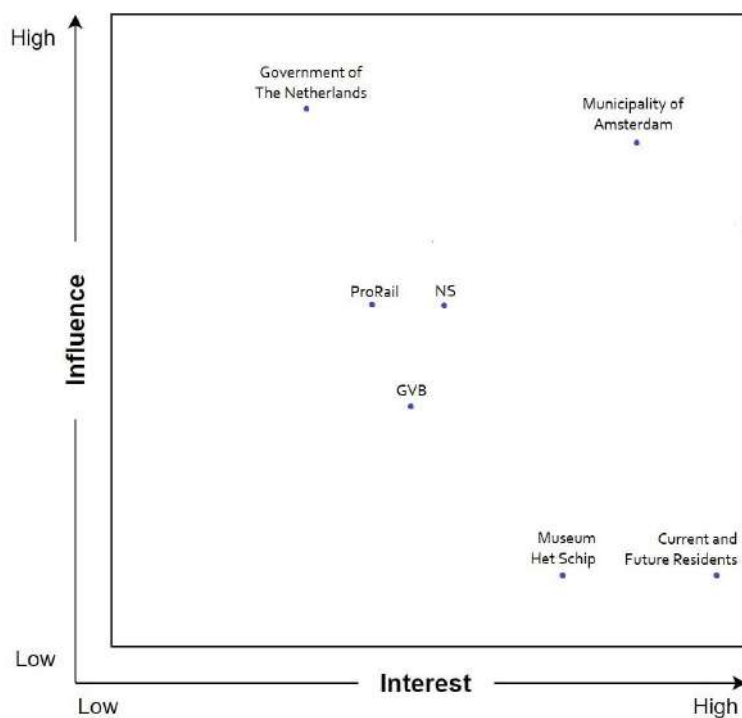


Figure 9: Matrix of the stakeholders of the redevelopment process of the marshalling yard (Developed by the authors).

While the **Government of The Netherlands** has relatively high influence on what happens in Dutch territory, their interest in the area appears to be low. They do, however, establish laws and strategies on allocation of land and resources that need to be followed and in compliance by any type of urban development plan.

As owners of public domain, the **Municipality of Amsterdam** has high interest and decisive power over what happens to the marshalling yard. There are no solid plans for the future of the Zaanstraat Emplacement, but the Municipality has already shown interest in attaching it to the Haven-Stad project, turning it into a high-density area that connects the surrounding neighbourhoods with Westerpark.

ProRail and the **Nederlandse Spoorwegen (NS)** are also two fundamental stakeholders in the marshalling yard. ProRail is currently responsible for the Dutch railway network, owning tracks and other relevant infrastructure, while the NS owns and is responsible for the servicing and maintenance of the trains. It is however uncertain whether they would be willing to sell the tracks, or possibly relocate, and close the maintenance warehouse.

If plans by the Municipality of Amsterdam go accordingly and the mobility plan for the Havenstad project is put in action, it would mean that the metro line would be expanded from Centraal Station to Sloterdijk (Gemeente Amsterdam, 2021), possibly passing by the Zaanstraat Emplacement. In that case, **Gemeentevervoerbedrijf (GVB)** would be an important stakeholder to consider, since they are the main Dutch public transport company in charge of trams, metros, ferries and buses.

Additionally, **Museum Het Schip** and its imposing expressionist architecture that managed to influence the Spaarndammerbuurt neighbourhood is also relevant in the future of the Zaanstraat Emplacement. They are the client of this report and have expressed interest in developing the marshalling yard in line with garden city principles and in a way that it is integrated into the surrounding neighbourhoods. The museum has expressed concerns about the Municipality's idea of integrating the marshalling yard in the Haven-Stad project and turning it into a high-density area. Afraid that it will affect the surrounding areas and the residents, they would prefer a development where the harmony between community and nature is prioritised.

Finally, the last stakeholder that is very important, but not always considered in the decision-process, are **current and future residents** of the area itself and also from adjacent neighbourhoods. These will be the most impacted by any type of change in the urban fabric, but are also the ones who know what the area lacks and needs, and will also be the ones with higher expectations. The interviewed residents have expressed their overall interest in the development of the marshalling yard, with a prevailing opposition to high-rise residential buildings being built in the Havenstad area overall (Het Schip Project Group 2, Interview 1; Het Schip Project Group 3, Interview 3) and the marshalling yard in particular (Het Schip Project Group 1, Interview 1). Instead, there is an interest in public green spaces in the new Havenstad (Het Schip Project Group 1, Interview 1; Het Schip Project Group 3, Interview 3; Het Schip Project Group 2, Interview 1). In the marshalling yard in particular, a cultural or education centre was proposed (Het Schip Project Group 2, Interview 1) as well as shops and

shared facilities for residents to foster interaction and combat social isolation (Het Schip Project Group 1, Interview 1).

5. Interventions

Following our client's request to analyse the Zaanstraat Emplacement and create a proposal that can integrate modern garden city principles and also taking into account the interests of different stakeholders, the authors created a plan with five potential interventions. The targeted area is the Marshalling Yard to ensure that the plan can be feasible. In particular, most of the interventions specifically focus on and shall be located in the existing warehouse of the marshalling yard (Figure 8).

Currently, the Municipality of Amsterdam views the Zaanstraat marshalling yard as a barrier between surrounding neighbourhoods and Westerpark. Therefore, the plan consists in transforming the current warehouse into an anchor space. The concept of "social anchors are any institution [...] that acts as a support for the development and maintenance of social capital and social networks" (Clopton & Finch, 2011, p. 71) This will be done through concrete interventions, which will be explained below, in order to increase social and territorial cohesion, without making the area a tourist attraction nor putting it at risk of gentrification. Having a public space that is unique and that provides a certain function, allows it to appear attractive in a network of public spaces (Pinto et al., 2011), therefore increasing the dynamics with other areas of the city.

5.1. Community

Social facilities such as healthcare, education, and recreation are as crucial as the roads and utilities that make up the physical infrastructure. From this concept, we moved forward and explored the possibility of finding something in line with a community centre that offers that kind of facility to the neighbourhood. Inspiration was taken from the Urban Workshop located in the Oodi Central Library of Helsinki, which offers different tools and services to visiting residents.

Thus, to contribute to the Garden City Principle of Community, a collaborative workshop is proposed. The collaborative workshop serves as a gathering place for residents to interact and learn from and with each other. Different subsections of the workshop provide different types of tools, such as areas to fix bicycles, sewing stations, woodworking stations and other tools, depending on the needs of the local residents. Mobile tools could be rented for a small fee and a deposit. Personnel would be provided to instruct the residents on using the tools, if needed. Instructional (group or individual) workshops in line with the provided tools for interested residents could be hosted to create opportunities for neighbours to interact and learn together.

Besides the social function of bringing residents together, the sharing of tools would eliminate the need for each household to own each tool. This serves a sustainability function of reducing individually owned items per household. Furthermore, it particularly benefits residents who live in smaller apartments or have a lower household income, as they would gain access to tools they then do not need to buy themselves or store in their apartment. The shared ownership of tools instead of land could be a more socially acceptable spin on the original Garden City ideal of shared ownership (see Hardy, 2005).

5.2. Climate Proofing

Regarding climate, we refer to locations that proactively address climate change to improve the appeal of the development and reduce its environmental impact. Community gardens and urban gardening are examples which play a crucial role in climate proofing cities. As urbanisation progresses, green spaces within cities are becoming scarce. Surrounding the marshalling yard, this is evident in the planned building of the Bredius project, which will replace existing green space. Hence why, a community garden with integrated (permeable) leisure space in the form of grass is proposed next to the warehouse. Thanks to the large window fronts of the warehouse, a small portion of the community garden could be located inside the warehouse, offering space for plants with different climatic needs. Required gardening tools could be lent in the collaborative workshop in the same building.

The ability of these urban gardens to distribute the advantages generated by larger parks, such as microclimate regulation and recreational activities is widely recognized in urban planning studies (Rosso et al., 2022). Additionally, green areas can increase permeable surfaces, which are important flood-proofing measures (Alexander et al., 2019). In fact, Rosso et al. (2022) observe that the integration of community gardens decreases floods brought on by weather events caused by climate change. The adjacent neighbourhood of Spaarndammerbuurt is already deemed a high-priority area in terms of rainwater management (Het Schip Project Group 2, Interview 1). Thus, flood-proofing should also be taken into consideration for the redevelopment of the marshalling yard. Moreover, Urban Heat Island effects have also been found to be reduced in a similar manner (Lin et al., 2017).

Besides the outlined environmental and climate-proofing benefits, community gardens are beneficial for a sense of community and volunteerism (Ohmer et al., 2009) and can promote community building, social cohesion, and lead to improvements in physical and mental health (Liu and Wang, 2021). Motivation from the residents of Spaarndammerbuurt can be expected, as at least two urban gardening initiatives have existed in the past years that create an important cornerstone for neighbourhood engagement, one of which had to be given up due to new Bredius housing projects (Het Schip Project Group 1, Interview 1; Het Schip Project Group 2, Interview 1). The integrated leisure space would create a local alternative to the close-by Westerpark which, by some residents, is already considered too

overcrowded during the summer months (Het Schip Project Group 1, Interview 1; Het Schip Project Group 2, Interview 1).

On a similar note, in the eventuality that tall buildings are erected in the Zaanstraat location, the roofs should be transformed into gardens. These rooftop gardens then serve as gathering spaces for individuals to collaborate in gardening activities, other than being a way to reduce the impacts of extreme weather events (Alexander et al., 2019). These factors make community gardening a valuable addition to efforts to make cities more resilient to the impacts of climate change. The focus of community gardens is on using gardening as a means to preserve and enhance the surrounding urban environment. This results in a greener urban area, reduces the urban heat island effect, and promotes biodiversity.

5.3. Connectivity

The mobility hub that is foreseen by the municipality for the new residential area of the marshalling yard after 2028 (Gemeente Amsterdam, 2022) can be nicely integrated into the warehouse space. Although two bus lines connect Spaarndammerbuurt to the main station and city centre, they will most likely reach their limitations once the Marshalling yard and the surrounding neighbourhoods are turned into residential areas (Het Schip Project Group 1, Interview 1). For a redevelopment of the whole Marshalling yard, an additional bus stop at the marshalling yard should be considered. In the long-term, the mobility hub shall offer car and bicycle parking spaces for visitors of the neighbourhood, as well as a sharing system for cars and bicycles and cargo-bikes for both residents and visitors.

In the short-term, the mobility hub is of even bigger importance. Examples of other Garden Cities show the difficulty of breaking with car dependence (Sharifi, 2016), and even the original model of Howard (Figure 2) aimed at high-speed public transportation to connect the garden cities to their surrounding. In the case of the marshalling yard, a close-by metro station will likely be available, once the municipality has closed the metro line between Sloterdijk and Centraal. However, This will not be feasible before 2030 (Gemeente Amsterdam, 2021). To ensure the meeting of demands until the new metro station in proximity to the marshalling yard is finished, additional parking facilities for shared cars and cargo-bikes will be made available. Most demand shall be met through additional car sharing offers, sharing offers for e-bikes and cargo-bikes, though few additional parking spots for private cars of residents will be made available in the short term. As the Havenstad is regarded as a car-free zone with only a limited number of households owning cars (Gemeente Amsterdam, 2022), the parking spots for private cars shall be repurposed according to the present demand, once a high-speed public transport connection to the rest of the city is available.

5.4. Character

Instead of developing standard and identical housing estates, we should design distinctive neighbourhoods, each with its own personality (Falk, 2017). In the case of the marshalling yard, this can mean preserving part of the existing structure of the warehouse in a way that the history of the building remains intact and visible. Adding on to this, a distinctive character can also emerge by taking inspiration from the adjacent neighbourhood of Spaarndammerbuurt (Figure 10). This, in fact, has some unique buildings made by following the Amsterdam School style. The structures are constructed with towers, ornate spires, elaborate windows, and doorways, using vibrant colours and diverse textures (Het Schip Museum, n.d.). Het Schip Museum is probably the most striking representation of this architectural style (Figure 10), in which the architect Michel de Klerk established all principal aesthetic elements for socialist solutions in housing and city planning (Casciato, 1996). In other words, playing with materials, colours and shapes was at the heart of de Klerk's style. Therefore, as it was pointed out by some of the interviewees, one of the best ways to preserve the marshalling yard is to use imagination by employing different materials and colours to make the building harmonious and eye-pleasing (Het Schip Project Group 1, Interview 1; Het Schip Project Group 2, Interview 1). This way, we can make sure that the new development reflects the spirit of the neighbourhood and keeps the history of the building alive. In other words, the uniqueness of the Amsterdam School style reflected in Spaarndammerbuurt, and in particular in Het Schip, can become a model for the renovation of the existing building in the marshalling yard, and also a starting point for the construction of potential new buildings in the same area.



Figure 10: Impression of the architecture in Spaarndammerbuurt (Picture taken by the authors).



Figure 11: Het Schip Museum (Museum Het Schip, n.d.).

Ultimately, this approach can lead the new redevelopment project to be more closely integrated with the existing neighbourhood. Current residents of the surrounding areas will potentially feel more at home when enjoying this new place, and future residents will also feel more integrated with the existing district. Overall, this special and distinctive character inspired by the Amsterdam School can contribute to building a sense of community across these neighbouring areas, between current and future residents.

It is a unique opportunity to create a new and distinctive neighbourhood that will be a valuable addition to the city. The aim of preserving the original structure and retrofitting it in the Amsterdam School architectural style is to allow for the creation of a neighbourhood that is not only beautiful but also functional and community-oriented.

5.5. Collaboration

Collaboration is a key aspect in any urban development project and is crucial for ensuring that the end result meets the needs and expectations of all stakeholders. As Falk (2017) points out, it is desirable to work across boundaries in order not to create an adversarial system that ends up delaying decisions and, consequently, adding costs.

Public participation may also be viewed as a chance for social learning. Since it is a social process when many stakeholders come together in a common space, they can get to know one another's values, think about their own values, and come up with a common goal and vision. Increased awareness, a shift in views, and a change in behaviour are all outcomes of dialogue and collaboration (Mathur et al., 2008).

The Municipality of Amsterdam, in fact, has highlighted the importance of creating sessions - “Schetchen aan” - that are specifically made to inform the public of the current stages of the HavenStad plan, as well as issues that might arise. However, after conducting interviews with current residents, it became evident that there is a clear gap in the communication between them and the developers of the urban development project (Het Schip Project group 1, Interview 1; Het Schip Project Group 3, Interview 3). Therefore, with our plan for the Zaanstraat marshalling yard, we would like to encourage dialogue between stakeholders and current and future residents, and increase their participation in the decision making process. Furthermore, since the Municipality of Amsterdam does not plan on starting constructions in the marshalling yard before 2025, this 2-year period can be seen as an opportunity to seek out to the general public to discuss and consult on what the future of the area will look like. By involving the public in the decision-making process, the Municipality of Amsterdam can increase the transparency of the project and ensure that it aligns with the needs and expectations of all those affected by the development.

6. Discussion

6.1. Reflections on the report

This report proposes concrete interventions to redevelop the Zaanstraat marshalling yard area in line with modern garden city principles and in a way that integrates it into the surrounding neighbourhoods. This chapter reflects on the research process and outlines some of the report’s limitations as well as opportunities for future research.

The authors of this report are aware that the five modern garden city principles selected as the conceptual basis are somewhat deviating from the original idea of Howard. More emphasis is placed on modern challenges of cities, such as climate change and social isolation. As many other neighbourhoods were designed inspired by the Garden City movement (Hügel, 2017), this proposal does not cohere with the central idea of collaborative land ownership. This decision was taken due to the observed difficulty of maintaining collective ownership properties over time (Miller, 1978; Lewis, 2015). No member of the municipality or a potential community of future residents as a central decision-maker on that matter could be reached in time for this project. Thus, ideas surrounding collaborative ownership rights and concrete ideas such as community land trusts seemed unfeasible to elaborate on in this proposal. Furthermore, it is questionable whether collaborative ownership of a particular neighbourhood would be legally feasible under the time pressure of the housing shortage or sensible to achieve an integrated neighbourhood. Conducting stakeholder discussions on collaborative land ownership and research on the effect of such ownership structures on the integration between different neighbourhoods would be relevant for pursuing related ideas in the future. Environmentally and socially sustainable examples from the sharing economy such as a collaborative

workshop are a new idea of integrating sharing principles in Garden City Projects that have, so far, not been discussed in the available literature.

In terms of the proposed intervention, an important limitation for this report is the availability of stakeholders. Despite reaching out to the municipalities and people from the marshalling yard, no response was given in the timeframe of creating this report. As a result, it is unclear whether the proposed interventions fit available resources and align with current project developments. Although existing reports on the Havenstad were consulted that outline the intended development of the area, some of the plans may be outdated at this point, as they were published several years ago. A discussion with representatives of the municipality would have provided valuable insights into their goals for the marshalling yard.

An effort was made to select interventions that are beneficial to all residents of the surrounding neighbourhoods. Whether or not the new neighbourhood will be sustainable and livable and its integration into the surrounding neighbourhoods will of course be dependent on its development beyond the warehouse, particularly the development of the residential buildings. The decision to focus on the warehouse was made to keep the development plan feasible within the available time frame. Successful social anchor spaces can, nevertheless, impact the social capital and cohesion of a neighbourhood (Clopton & Finch, 2011). Ideas on how to achieve low-density residential areas in line with Garden City ideals can be taken from the other two project reports of the Future Societies Lab 2023 conducted for the client Het Schip.

The interviewed residents almost exclusively live on the Zaanstraat, which is right next to the marshalling yard, and few close-by streets. No residents of other surrounding neighbourhoods were interviewed. Furthermore, they were all proposed by the client. Thus, it is unlikely that they comprise a representative sample. The proximity to the marshalling yard area may lead to an overly critical perception of the planned developments, especially in terms of housing density and building height. As one interviewee pointed out, the redevelopment affects the daily view from their apartment (Het Schip Project Group 1, Interview 1). Future research on this sub-area of the Havenstad and any final decisions on the redevelopment of the marshalling yard should take the needs of other residents into consideration. A survey of residents from other parts of the neighbourhood and possibly interview other stakeholders, such as Westerpark interest groups is recommended. The interventions proposed in this report, specifically the concrete tools offered in the collaborative workshop and the capacities of the mobility hub, should be planned with the demographic characteristics and needs of the future residents of the marshalling yard area in mind.

6.2. Reflections on the group work

The submitted project is a group effort. The group met up several times a week throughout the duration of the project and individual tasks were distributed according to interest, previous experience and, where required, knowledge of Dutch. Ideas for the final interventions were gathered in collective brainstorming sessions. The entire process was harmonious, and no conflicts arose between group members. While some group members contributed slightly more text to the final report, others prepared the final presentation. Overall, each member of the group contributed equally to the final products and the awarded points should be divided equally across all group members.

7. Conclusion

This report aimed at creating a redevelopment concept of the marshalling yard in line with modern garden city principles to ensure the area will be well-integrated into the surrounding neighbourhoods. The five principles of community, climate proofing, connectivity, character and collaboration were chosen to guide the redevelopment and five concrete interventions mostly surrounding the existing warehouse of the marshalling yard were proposed. Precisely, the authors propose to create a collaborative workshop, a community garden and a mobility hub while maintaining the character of historic surrounding neighbourhoods and retaining the unique warehouse building of the marshalling yard. The entire process and all proposed ideas should be further discussed in a collaborative manner between the relevant and identified stakeholders. The report aims to contribute to the conversation on one of the sub-areas of developments of the Havenstad project. The modern Garden City principles proved helpful to generate diverse and unique ideas on how to develop a livable and sustainable neighbourhood outside of the regular toolbox of the Havenstad development project. The chosen five principles deviate from some of the original Garden City ideals but remained flexible enough to ensure that relevant challenges identified for the area by the municipality and the residents could be addressed, such as flood-proofing measures, the need for additional green spaces and social interactions between residents. Instead of focusing on designing a purely residential area, concrete components of a community centre in the warehouse offering collaborative spaces and local services were proposed, aiming to attract future residents from the marshalling yard and residents of the surrounding neighbourhoods. Difficulties reaching relevant stakeholders during the research process lead to some limitations of the final result. Therefore, further efforts must be made to ensure the feasibility and desirability of the proposed interventions. As it is the first in-depth development plan for the Zaanstrat marshalling yard that is publicly available, it can nevertheless provide a conversation basis between the identified stakeholders.

8. Sources

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8.2. Interviews

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Het Schip Project Group 2, Interview 1 with two residents of Spaarndammerbuurt. 24.01.2023. Group members: Bart de Looze, Fedde Both, Nick Ayele, Stijn Schouten.

Het Schip Project Group 3, Interview 3 in written format with one resident of Spaarndammerbuurt. n.d. Group members: Devan Aziz, Elisa Kamps, Kevin Boyle, Louis Siow.